Expert Lotto Documentation

Expert Lotto is a universal lottery software suitable for any numerical lottery. Expert Lotto supports:

- **Jackpot** lotteries which draw all winning numbers from the same pool, optionally an extra bonus number(s) are also drawn from the same pool.
- **Keno** lotteries which draw all winning numbers from the same pool but less numbers are marked on a bet-slip.
- **Powerball** lotteries which draw main winning numbers from the same pool and one or more additional numbers from a different pool(s).
- **Pick-3** / **Pick-4** / Pick-N lotteries which draw each winning number from a separate pool.

With Expert Lotto you can easily handle and automate any of the following tasks:

- Track and manage past winning numbers
- Create, import, export wheels
- Print to paper playslips
- Check your winnings
- Statistically analyze past winning numbers
- Find the Jackpot winning numbers using unique History features
- Implement advanced lottery strategies using Complex Filters and Custom Analyzers

There are many features in Expert Lotto to help you with the selection of numbers for the next draw and to improve your bet/win balance. The results of all functions are always reproducible because there is solid math behind every Expert Lotto feature. The application is not a black box providing different results each time the same function is used.

This documentation provides detailed description and explanation of all Expert Lotto features. Just press *F1* key at any time while working with Expert Lotto to see how to use the current application screen or window in these help pages. It is strongly recommended to read through the *Getting Started* section of this manual before using Expert Lotto. Also visit our online tutorials where you can find practical, step-by-step instructions for some of the most common tasks. You can also share your experience with other Expert Lotto users in our discussion board.

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First Steps

When starting Expert Lotto for the very first time only Start Page window is showing and most menu and toolbar buttons are disabled. To start working with Expert Lotto you must first open a lottery. Click menu *File - New - Lottery* to open New Lottery wizard. Select the lottery you wish to play from the list and click *Next* button. Then you will be prompted to choose folder to store lottery data in. Click *Finish* button and select *Yes* button to open the new lottery. Additional application windows will open and you can start playing your lottery. If you quit Expert Lotto and then start it again the application will reopen the lottery from the folder on your disk and you can continue playing your lottery.

This way you can setup multiple lotteries, however only a single lottery can be opened in Expert Lotto at a time. To play a different lottery choose menu *File - Open Lottery* or pick a recent lottery using menu *File - Open Recent Lottery*.

Familiarize yourself with application menu and toolbars, try opening and closing various windows, customize the window layout. Don't be afraid to experiment as you can recreate the lottery setup and thus revert all changes at any time.

Winning Numbers

- All lotteries available in Expert Lotto come with a database of past winning numbers. To see the past draws click menu *Winning Numbers - Show As - Table*.
- If the winning numbers database is outdated you can add missing draws either manually using menu *Winning Numbers - Add* or download them directly from the lottery web site (if available) from menu *Winning Numbers - Online Update*.
- If you created a custom lottery you will probably need to do a bulk import of past draws using menu *Winning Numbers - Import*.

Wheels

- Expert Lotto does not ship with any wheels. There are numerous sources of all types of wheels on internet. You can download any such a wheel and open it in Expert Lotto using menu *Package - Insert - Ticket File*.
- You can also create so called *full wheels* which contain all possible numbers combinations from selected pool of numbers, click menu *Package - Insert - Full Wheel*.
- If you prefer random combinations of selected numbers just use menu *Package - Insert - Random Numbers*.

Filters

- After successfully loading or creating a wheel you may want to reduce the wheel size to make a cost-effective bet. There are numerous filters in Expert Lotto for this purpose. You can find them in Filters window or just click menu *Package - Reduce - Filter Tickets*.
- For advanced lottery strategies you may consider combining several simple filters into a single Complex Filter to implement advanced filtering logic, click menu *File - New - Complex Filter*.

Statistics

- Statistical analysis of past draws is an important step when selecting the numbers for the next draw. Summary statistics of past winning numbers are available from menu *Winning Numbers - Analyze*.
- To see per-draw statistics click menu *Winning Numbers - Show As - Properties*.

Playslip Printing

When you are done with filtering you can print directly to paper playslips using menu *Package - Print to Playslips*.

History

Winning numbers History is a unique feature which allows to find the Jackpot winning ticket with 100% guarantee. The starting point is menu *History - Latest* and menu *History - Summary*.

Lotteries

Expert Lotto ships with a growing list of pre-defined lotteries of all types from around the world. And if your favorite lottery isn't available you can still setup a new custom lottery. The predefined lotteries include the database of past winning numbers. However our resources are limited so we cannot track the winning numbers of all the lotteries nor can we guarantee 100% accuracy of the drawn numbers. You must contact the lottery commission or search internet to find missing draws to make your winning numbers database up-to-date. Custom-created lotteries have no winning numbers and you must import the past draws yourself.

Each lottery created with New Lottery wizard is stored in a separate folder on your disk. To open the lottery you must click menu *File - Open Lottery* and browse that folder. There can be only a single lottery in each folder. However you can use the *New Lottery* wizard to create multiple instances of the same lottery in different folders. Alternatively you can just copy the whole lottery folder to a new location. Do not create any lotteries in application's installation folder. You may loose your data when upgrading to a new application version or when uninstalling the application.

Each lottery folder contains the following files:

- *lottery.xml* - a text file which defines the lottery rules (number pool size, draw schedule etc). Do not edit this file!
- *winningnumbers.db* - binary file with past draws. Do not edit this file!
- *.settings* - folder with your preferences and settings.
- *tmp* - folder for temporary files.

It is recommended to store all lottery related files - wheel files, complex filters, custom analyzers etc. - in the same lottery folder.

It is a good practise to backup your lottery folders from time to time - just use any file backup software available for your operating system.

If you no longer want to play some lottery, just make sure it isn't currently opened in Expert Lotto and simply delete its whole folder.

To find more information about the current lottery in Expert Lotto click menu *Help - About* and switch to *Lottery* tab.

▶ Click 🖥 button to the right of the lottery name field to create a ZIP file with a backup copy of your lottery settings. The created ZIP contains only the lottery settings and winning numbers database, it does *NOT* include any other files from the lottery folder. This way you can share the lottery with other Expert Lotto users.

▶ Click ➡ button to the right of the lottery folder field to open that folder in default file browser application.

See also lottery management tools.

Glossary

- **Ticket** - usually an ordered set of numbers for a single bet in your lottery. Also known as *line*.
- **Package** - denotes the part of application which holds the tickets you are currently working with.
- **Winning Numbers** - this terms refers to numbers that the lottery drew as the winning ones. Other used terms are *past draws* or just *draws*.
- **Filter** - yes/no condition applied to tickets which allows to remove or keep only tickets with desired numbers and properties.
- **History** - a unique application feature which tracks the past occurrences of ticket numbers allows finding the Jackpot winning ticket with 100% guarantee.
- **Playslip** - also known as bet slip is the piece of paper you pick up in lottery agent's shop and mark the numbers you wish to bet on.
- **Panel** - is a grid of drawn numbers as they appear on lottery's official playslip.
- **Masked Positions** - when playing e.g. 6/49 lottery each ticket has six numbers. With masked positions you can hide one or more ticket positions and work with a ticket that has e.g. only five numbers.
- **Tagged Tickets** - each ticket in the Package has a special on/off flag. Ticket tagging is usually used when manually evaluating each ticket in the Package to mark tickets with interesting numbers or properties. There are several functions for working with tagged tickets.
- **Hot / Cold Numbers** - numbers are *hot* when they have been drawn very frequently in the last few draws, *cold* numbers are those which haven't been drawn at all or only once or twice in the last few draws.
- **Sum Root** - is an artificial construct which divides all tickets into 9 categories. First the sum of all ticket main numbers is calculated then the digits of the resulting are repeatedly summed until a single digit 1 to 9 remains.
- **Standard Deviation** - is a mathematical formula to measure the variability or dispersion of a set of numbers, also known as *StdDev*.
- **What-If** - is a customizable set of numbers the application presents in various tables and charts to see **what** would happen **if** those numbers were drawn in the very next draw.
- **Number Coloring** - in most cases the application displays ticket numbers in a table. To enhance visual perception of ticket numbers it is possible to change the background color of table cells according to various criteria. For example *hot/cold* numbers have their backgrounds filled with different shades of red/blue color.
- **Demo Lotteries** - *Expert Lotto 6/49*, *Expert Lotto Keno*, *Expert Lotto PowerBall* and *Expert Lotto Pick 3* are artificial lotteries and their winning numbers were randomly generated. You cannot bet on these lotteries anywhere in the world. They are provided to demonstrate Expert Lotto features and as examples in the application help pages.

Main Menu

File

- **New**
  - **Complex Filter** - creates a new [Complex Filter](#).
  - **Analyzer** - starts [New Analyzer](#) wizard.
  - **Custom Analyzer** - creates a new [Custom Analyzer](#).
  - **Lottery** - starts [New Lottery](#) wizard.
- **Open File** - opens a file from disk. You can open either a saved *Complex Filter* or *Custom Analyzer* file or you can open and edit any plain-text or CSV file. It is also possible to open a file by dragging it from system file manager window and dropping it to Expert Lotto main window.
- **Open Recent File** - reopens a previously used file.
- **Open Lottery** - opens a lottery.
- **Open Recent Lottery** - reopens a previously used lottery.
- **Import Lottery** - imports lottery settings from *Expert Lotto version 4.x*.
- **Save** - saves the content of active editor window to file.
- **Save As** - saves the content of active editor window under a different file name.
- **Save All** - saves all modified editor windows.
- **Export** - exports currently selected table or chart.
- **Page Setup** - opens window to customize printing preferences.
- **Print** - prints currently selected table.
- **Exit** - quits the application, you will be prompted to save any modified files and/or current Package contents.

Edit

- **Undo** - reverts the last operation.
- **Redo** - reverts the last *Undo* operation.
- **Cut** - removes the current selection and puts it into the system clipboard.
- **Copy** - copies the current selection to the system clipboard.
- **Paste** - pastes the clipboard content.
- **Delete** - deletes the current selection, e.g. selected rows in *Package Table* window.
- **Find** - opens window to find a ticket in a ticket table.

- **Replace** - opens a window to replace one Package ticket with another.

View

- **Web Browser** - opens the default web browser application.
- **Application Log** - shows the content of application log file where the application keeps track of important events and problems encountered during application session.
- **Toolbars** - *Note:* This menu also pops up when any toolbar is right-clicked.
    - **File** - toggles toolbar with file related buttons.
    - **Clipboard** - toggles toolbar with clipboard buttons.
    - **Undo/Redo** - toggles toolbar with *Undo* and *Redo* buttons.
    - **Package** - toggles toolbar with important *Package* actions.
    - **Tagged Tickets** - toggles toolbar with buttons for working with tagged tickets.
    - **Number Coloring** - toggles Number Coloring toolbar.
    - **What If** - toggles What If toolbar.
    - **Memory** - toggles available memory meter.
    - **History** - toggles toolbar to adjust the count of History Levels.
    - **Notes** - toggles toolbar for short notes.
    - **Reset Toolbars** - restores all toolbars to their default configuration.
    - **Customize** - opens toolbar customizer window where you can add more buttons to toolbars by dragging them from action list and dropping them to desired position in any toolbar. To remove a button from a toolbar drag the button from the toolbar area and drop it. To restore all toolbars back to their default configuration select *Reset Toolbars* menu item.
- **Split orientation** - changes the layout of some split windows. *Horizontal* means that split windows are arranged side-by-side. *Vertical* means that one split window is placed under the other split window. Horizontal split layout is usually better suited for wide-screen displays.
- **Full Screen** - toggles full screen mode when the main title bar and toolbars are removed and the main window occupies the whole screen area.

Package

- **Show As**
    - **Table** - shows the Package contents as a table.
    - **Matrix** - shows the Package contents as a matrix.
    - **Properties** - shows statistical properties of the tickets in the Package.
    - **Winnings** - shows winnings for Package tickets.
- **Insert**
    - **Tickets** - inserts tickets whose numbers are entered using keyboard.
    - **Ticket File** - insert tickets from selected file.
    - **Random Numbers** - inserts combinations of randomly generated numbers.

- □ **Full Wheel** - inserts all possible combinations of selected numbers.
- **Insert Recent File** - inserts previously used ticket file.
- **Save to File** - stores Package contents to a file.
- **Reduce**
  - □ **Filter Tickets** - removes some tickets from the Package using built-in [filters](#).
  - □ **Mutual Match** - compares tickets in the Package with each other.
  - □ **Optimize Coverage** - removes surplus tickets from the Package while maintaining given win guarantee.
  - □ **Best Tickets** - selects several ['best'](#) Package tickets.
  - □ **Random Selection** - removes several randomly selected tickets.
  - □ **Systematic Selection** - removes every N-th ticket from the Package.
- **Analyze** - opens Package tickets *Analyzer*.
- **Check Winnings** - checks [winnings](#) of Package tickets.
- **Coverage** - calculates the minimum [win guarantee](#) for Package tickets.
- **System Bet** - adds some numbers to each ticket to create a [system bet](#).
- **Print to Playslips** - [prints](#) Package tickets to paper playslips.
- **Duplicates**
  - □ **Remove** - ensures that each ticket is present in the Package only once.
  - □ **Keep** - leaves in the Package only tickets that are present more than once. This function is the opposite to *Duplicates - Remove* feature.
- **Sort**
  - □ **Ascending** - sorts tickets in ascending order.
  - □ **Descending** - sorts tickets in descending order.
- **Shuffle** - randomly changes the order of tickets in the Package.
- **Swap Numbers** - replace selected ticket numbers with other numbers.
- **Tagged Tickets**
  - □ **Remove** - removes tagged tickets from the Package.
  - □ **Keep** - leaves in the Package only tagged tickets.
  - □ **Clear Tags** - removes the tagging flag from all tickets in the Package.
  - □ **Invert Tags** - tagged tickets become untagged and untagged tickets become tagged.
- **Mask Numbers** - opens window to replace selected pool numbers with [masked numbers](#).
- **Masked Positions** - opens window for working with tickets with [masked positions](#).
- **Undo** - restores previous Package contents.
- **Redo** - reverts the last Undo operation.

- **Clear** - removes all tickets from the Package.

  Note: All Package actions are revertable using *Undo/Redo* actions from the main menu - however these actions are enabled only when any Package window is the active window.

Winning Numbers
- **Show As**
    - ▫ **Table** - shows winning numbers as a [table](#).
    - ▫ **Matrix** - shows winning numbers as [matrix](#).
    - ▫ **Properties** - shows winning numbers together with their [statistical properties](#).
    - ▫ **Charts** - shows winning numbers as statistical [charts](#).
- **Analyze** - opens winning numbers [Analyzer](#).
- **Check Winnings** - checks the winning numbers database for [past winnings](#).
- **[Predictions](#)** - attempts to predict the winning numbers and some statistical properties for the next draw using pattern matching.
- **Bonus As Main / Separate Bonus** - This action merges bonus number(s) with the main ticket numbers. So for example *6+1/49* lottery (which draws 6 main numbers and 1 bonus number from the pool of 49 numbers) will become a *7/49* lottery (which draws 7 main numbers from the pool of 49). Then it is possible to analyze and filter bonus number(s) the same way as the main ticket numbers. Selecting *Separate Bonus* action from the main menu reverts back to the original lottery settings.
  Note: A star (*) character in application's title indicates that bonus number is treated the same way as main ticket numbers.
  Note: This action is enabled only for lotteries that draw one or more bonus numbers from the same pool as the main numbers.
- **[Add](#)** - opens window listing draws missing in winning numbers database.
- **[Edit](#)** - opens winning numbers manager window.
- **[Import](#)** - imports past draws from a file or other sources.
- **Online Update** - updates winning numbers database from a selected [online source](#) of past draws.

History
- **Latest** - opens [Latest History](#) window.
- **Summary** - opens [Summary History](#) window.
- **My Estimates** - opens [My Estimates](#) window.
- **[Predictions](#)** - attempts to predict History Sum values for the next draw using pattern matching.
- **Synchronize Levels** - toggles History [Level synchronization](#) on/off.

Tools
- **Ticket Panel** - opens [Ticket Panel](#) window.
- **Ticket Properties** - opens [Ticket Properties](#) window.
- **[Filters](#)** - opens window listing all available filters.

- **Playslips** - lists all available playslip layouts.
- **Number Groups** - opens Number Groups Manager window.
- **Lottery**
    - **Create New** - starts New Lottery wizard. It is the same function as menu File - New - Lottery.
    - **Edit** - starts Edit Lottery Settings wizard where you can modify some lottery options.
    - **Resize** - starts Resize Lottery wizard where you can adjust the count of main ticket numbers and/or merge bonus number(s) into the main numbers.
    - **Backup** - creates a ZIP archive of currently opened lottery. The backup file contains winning numbers database and all necessary lottery settings.
- **Plugins** - opens Plugin Manager window to install new plugins or to disable already installed plugins.
- **Options** - opens *Options* window to customize application preferences.

Window

- **Close Window** - closes the active window.
- **Maximize Window** - enlarges the active window across the whole main window area.
- **Undock Window** - detaches the active window from the main application window.
- **Undock Window** - detaches the active window from the main application window.
- **Clone Document** - creates a copy of active document window.
- **Close Other Documents** - closes all document windows except the active one.
- **Documents** - opens a window listing all opened document windows.
- **Reset Windows** - restores the window layout back to its default configuration.

Help

- **Help Contents** - shows this help window.
- **Start Page** - opens Start Page window.
- **Check for Updates** - looks for application updates, you must be online to use this feature.
- **About** - opens *About* window.

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Main Toolbars

Toolbars at the top of the main application window offer quick access to some of frequently used application features. All toolbars can be switched on or off using menu *View - Toolbars*. Alternatively you can right-click empty space in the toolbar area to invoke popup menu. You can drag and drop any toolbar to change its position in the toolbar area.

To customize to toolbars choose menu *View - Toolbars - Customize* or select the same action from toolbar's popup menu. This opens a new window listing all available toolbar actions which you can drag and drop to any toolbar. To remove an existing action from a toolbar drag and drop that action out of the toolbar area. Menu action *View - Toolbars - Reset Toolbars* restores the default toolbar set and their actions.

File

- opens a new [Complex Filter](#) window.
- opens [Ticket Analyzer](#) wizard.
- opens a new [Custom Analyzer](#) window.
- opens a new lottery.
- saves changes to a complex filter or custom analyzer to disk.
- saves all modified complex filters or custom analyzers to disk.
- exports currently selected table.
- prints currently selected table.

Clipboard

- cuts currently selected content and puts into the system clipboard.
- copies currently selected content and puts into the system clipboard.
- pastes content from the system clipboard.

Undo/Redo

- reverts the results of the last action.
- reverts the last *Undo* action.

Package

- inserts into the Package tickets whose numbers are entered using keyboard.
- insert tickets from selected file.
- inserts combinations of randomly generated numbers.
- inserts all possible combinations of selected numbers.
- stores Package contents to a file.
- removes some tickets from the Package using built-in filters.
- opens Package tickets Analyzer.
- checks winnings of Package tickets.
- calculates the minimum win guarantee for Package tickets.
- prints Package tickets to paper playslips.
- ensures that each ticket is present in the Package only once.
- sorts tickets in ascending order.

- sorts tickets in descending order.
- randomly changes the order of tickets in the Package.
- replace selected ticket numbers with other numbers.
- opens window for working with tickets with masked positions.
- restores previous Package contents.
- reverts the last Undo operation.
- removes all tickets from the Package.

Tagged Tickets

- removes [tagged](#) tickets from the Package.
- leaves in the Package only tagged tickets.
- removes the tagging flag from all tickets in the Package.
- tagged tickets become untagged and untagged tickets become tagged.

Number Coloring

Turns [number coloring](#) on/off, also selects number coloring layouts.

What If

Toggles [what-if](#) ticket numbers on/off.

Cut-off Draw Date

Turns [cut-off draw date](#) on/off.

Memory

Show the amount of available free memory. Clicking this toolbar attempts to release obsolete internal objects to free some more memory.

History

Has a spinner field where you can quickly and conveniently adjust the count of [History](#) levels.

Notes

Has just a single text input field you can use for various temporary notes. It is also possible to copy/paste any ticket numbers into this field.

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Customizing Windows

The whole application window is divided into several areas holding one or more internal windows. You can adjust the size of each area by dragging the border between the areas. Each internal window has its own title bar showing window name and buttons for manipulation with the window. Right-clicking window title bar brings up a popup menu offering window management functions, see below.

The central area holds the most important windows like [Package Table](#), [Winning Numbers Table](#), [Complex Filter](#) or [Analyzer](#) windows. Keyboard shortcut *CTRL+TAB* switches between these windows. You can also click drop-down button at the top right corner of this area or use menu *Window - Documents*.

Support windows and tools windows are arranged around the central area, for example [Ticket Properties](#), [Filters](#) or [Ticket Panel](#) windows are positioned to the right of the central area.

Opening Windows

You can open application windows from the main menu or by clicking main toolbar buttons or using keyboard shortcuts. Each window opens in its predefined area.

Closing Windows

To close a window click the close button in its title bar. You can also use *CTRL+W* keyboard shortcut or use menu command *Window - Close Window*.

Active Window

Each area shows just one window at a time. To show a different window simply click the title bar of the window you wish to switch to, or press the keyboard shortcut assigned to the window. The window that has input focus - reacts to keyboard commands - is the active or current window. The title bar of the active window is highlighted with a different color. Some menu and toolbar actions are related to the active window. For example *Undo/Redo* commands are available only when a *Package* window is activated. *Save* action is enabled only when an unsaved complex filter or custom analyzer is the active window.

Maximizing

Any window can be enlarged to occupy the whole main window area - simply double-click its header or choose appropriate action from its popup menu. To restore the window back to its original size and position double-click its title bar again or choose *Restore Window* from its popup menu.

Minimizing

Windows that are not in the central area, i.e. the support windows and tool windows can be minimized to the edges of the main window by clicking minimize button at the top-right corner of window's title bar or by selecting *Minimize Window* action from its popup menu. When a window is minimized you can see its title and icon at the edge of the main application window. Hovering your mouse above the window title will temporarily bring the window back. To restore the window back to its original position and size click the restore button at the top-right corner of window's title bar or untick *Minimize Window* item in its popup menu.

Undocking

You can undock any window and make it floating independently of the main application window by choosing *Undock Window* from its popup menu. This is especially useful when having multiple monitors, for example you can arrange support windows like *Filter* list to secondary screen for easier access.

Rearranging

You can move any window to a different location within the main application window by dragging its title bar. While dragging a window a red rectangle provides an indication where the window will be positioned when dropped.

All changes to the window layout are persistent over application restarts. Menu *Window - Reset Windows* restore the default window layout.

The window which is currently the active one - has input focus - has its title bar highlighted in a different color.

Application Updates

Expert Lotto is under constant development and new features are being added very frequently. Installing the updates adds new features to Expert Lotto or fixes bugs found in previous application versions or both. It is strongly recommended to install all updates when they are available.

When Expert Lotto is running and internet connection is available then the application will periodically check for new updates at Expert Lotto web server. You will see a message at the lower right corner of the main application window when new updates are available. Clicking the notification message starts update wizard which downloads and installs selected updates. In most cases the installation of updates requires application restart so make sure you have saved your work before applying the updates.

You can also check for updates manually using menu *Help - Check for Updates*.

Keyboard Shortcuts

Most menu and toolbar actions have a keyboard shortcut assigned - instead of clicking through the main menu you can invoke the action by pressing a combination of keys. The assigned shortcuts are visible in the main menu items and also in toolbar buttons tooltips. You can change the keyboard shortcuts and define new ones in *Options* window under *Keymap* tab. Click menu *Tools - Options* to open the *Options* window.

Keymap tab lists all available actions and their assigned shortcuts. To change a shortcut or define a new one just double-click the appropriate *Shortcut* column cell and press the desired combinations of keys on your keyboard.

It is recommended to spend a little time memorizing shortcuts to frequently used actions as it will greatly improve your work flow in Expert Lotto.

Plugin Manager

The whole Expert Lotto application is built as a collection of independent modules - plugins. Each module provides a different set of features.

You can see the list of plugins in the *Plugins* window which opens from menu *Tools - Plugins*. This window lists the plugins - updates - that are published on Expert Lotto server and allows the management of plugins that are already included in your Expert Lotto installation. The window consists of several tabs:

- **Updates** - shows application updates (when available) which are new versions of already installed plug-ins. Installing new version of existing plugins will fix some bugs or add new features to Expert Lotto or both.
- **Available Plugins** - shows new plugins which are not included in your Expert Lotto installation yet. When installed these plugins will add new features to Expert Lotto.
- **Downloaded** - you can use this tab to install manually downloaded plugins - just click *Add Plugins* button to browse the plugins you have downloaded from internet.
- **Installed** - shows all plugins your Expert Lotto installation consists of. You can deactivate or uninstall some of these plugins at this tab. However it is not recommended because it would disable some of Expert Lotto functionality.
- **Settings** - defines the web address where the application checks for new updates and also the interval for update checking. Do not modify the *Update Center* address because you might lose the ability to automatically check and apply new application updates.

Upgrading from Expert Lotto version 4.x

You should read through this chapter if you are upgrading from *Expert Lotto version 4.x*. Although you will find the Expert Lotto 5 has the same set of features (and many new ones) as version 4.x, most of the application screens were reorganized and also some common terms have been renamed to make Expert Lotto more accessible for first-time users.

- The main application window in version 4.x is organized into several tabs switchable at the bottom. There's a new window layout in Expert Lotto 5:

Application Page in version 4.x	Menu command in Expert Lotto 5
Package	*Package - Show As - Table*
Visual Package	*Package - Show As - Matrix*
Package Winnings	*Package - Show As - Winnings*
Winning Numbers	*Winning Numbers - Show As - Table*
Visual Winning Numbers	*Winning Numbers - Show As - Matrix*
Statistics	*File - New - Analyzer*
Package Statistics	*Package - Show As - Properties*

Filter Statistics	*File - New - Custom Analyzer*
WN History	*History - Latest* *History - Summary*

- *Compound* and *Group* filters in version 4.x are available as [Complex Filters](#) in Expert Lotto 5.
- Version 4.x has all ticket filters listed in the main menu, in version 5 the filters are available from [Filters](#) window.
- *Coverage* filters from version 4.x (*Optimizer, Minimizer, Fast Minimizer*) are integrated in to a single [Package Optimizer](#) filter in Expert Lotto 5, see menu *Package - Reduce - Optimize Coverage*.
- *Winning Numbers* table and charts from *Statistics* page in version 4.x can be found under menu *Winning Numbers - Show As - Properties* and *Winning Numbers - Show As - Charts* respectively in Expert Lotto 5.
- Automated [pattern matching predictions](#) from *Statistics* and *History* pages respectively in version 4.x are available in Expert Lotto 5 from menu *Winning Numbers - Predictions* and *History - Predictions*.
- *Dummy Numbers* were renamed to *Masked Positions*.
- In version 4.x the *History* features tracks 11 past occurrences of each winning number. These occurrences are labeled *Column 0* to *Column -10*. Expert Lotto 5 uses [terms](#) *Level 0* to *Level 10*.
- Expert Lotto version 4.x installation has all lotteries available from menu *Lottery - Select* and menu *Lottery - Manager* is used to install additional lotteries or to remove existing ones. In version 5 you have to use menu *File - New - Lottery* to create a new lottery and use menu *File - Open Lottery* to switch to a different lottery. Read more [here](#).
- If you play a lottery in version 4.x that isn't listed on Expert Lotto web site you must first [import](#) that lottery into Expert Lotto 5.

Winning Numbers Manager

Menu command *Winning Numbers - Edit* opens *Winning Numbers Manager* window showing all past draws from your winning numbers database.

Editing winning numbers

To change numbers for an existing draw - for example because you made a mistake when adding new draws, click the draw date you want to modify. The fields above the table are populated with the selected draw date and winning numbers. Enter new ticket numbers and click *Replace* button at the top-right corner of the window.

Option *Jackpot* allows marking the selected draw date as Jackpot winning draw. That means that some lottery player got all the winning numbers right on that draw date and won the Jackpot / 1st prize.

When adding a new draw to winning numbers database first select appropriate draw date in the fields above the table - note that *Replace* button changes to *Add* button. Then enter the new winning numbers and click *Add* button.

Removing draws

Button *Remove* deletes the selected draw(s) from the database. Regularly scheduled deleted draws automatically reappear in Add Winning Numbers window.

Hidden draws

Tick the check box in the last table column to hide a draw. Hidden draws remain in winning numbers database however such draws are not included in the selection of past draws in other application windows. You can use this feature to temporarily remove one or more latest draws to back-test your lottery strategies. When one or more draws are hidden then draw selection fields start with a star sign (*) to indicate that some draws are hidden.
Note: An alternative approach for such back-testing is Cut-Off Draw Date.

Out-of-schedule draws

Each lottery has a fixed schedule when the winning numbers are drawn. It can be for example daily or once a week on Sundays or twice a week on Wednesday and Saturday. Sometimes a draw may be postponed to other day because there's e.g. public holiday on the scheduled draw day. Draws that are out of the regular schedule are displayed using red color in winning numbers tables.

Void draws

If no winning numbers were drawn on a scheduled date you can mark that draw date as void in *Add Winning Numbers* window. Such draw dates are displayed using strike-through font. You must tick *Show all entries* option to see such draws in this window.

When you are done editing your winning numbers database, click button *Save* to store the changes to disk and refresh all application windows that display winning numbers.
Button *Cancel* reverts all changes and keeps the winning numbers database intact.

▶ Click *Date* column to sort the table in ascending or descending order. Click *Hidden* column to show all hidden draws together at the top or at the bottom of the table.

Analyze Past Draws

Menu *Winning Numbers - Analyze* starts Tickets Analyzer wizard to calculate summary statistics for past winning numbers. In wizard's first step you can choose the range of past draws to be analyzed. In the next wizard step then select which statistics should be calculated. Clicking *Finish* button opens Analyzer window showing tables and charts for selected statistics. You can open as many *Analyzer* windows as you want using this menu command.

Add Winning Numbers

Menu *Winning Numbers - Add* opens a new window listing all draws that are missing in your winning numbers database up to the current calendar date. Use this feature regularly to keep your winning numbers up-to-date. Most lotteries publish their winning numbers in news papers and/or on internet. If there are many draws missing in your database then it is better to use [Winning Numbers Import](#) wizard or [Winning Numbers Online Update](#) (if available for your lottery).

Click any row in the table, enter winning numbers for the selected draw date into edit fields and then click button *Add*.

Option *Jackpot winner* allows marking the selected draw date as Jackpot winning draw. That means that some lottery player got all the winning numbers right on that draw date and won the Jackpot / 1st prize.

Click button *No Draw* if no winning numbers were drawn on the selected date(s). This may happen when a draw was cancelled, e.g. because of public holiday.

When you are done adding new draws, click button *Save* to store the changes to disk and refresh all application windows that display winning numbers. Button *Cancel* reverts all changes and keeps the winning numbers database intact.

▶ When entering ticket numbers prepend single-digit numbers with zero to automatically move input focus into the next number field. For example enter "01" instead of "1".

Note: This window list only scheduled missing draws. If you need to enter winning numbers for a draw made out of the regular schedule then you must use [Winning Numbers Manager](#). For example a lottery draws winning numbers on Wednesdays and Saturdays and one of Saturday's draws was postponed to Sunday to avoid a public holiday on Saturday. Mark the Saturday draw date as void using *No Draw* button in this window and open *Winning Numbers Manager* to add winning numbers for Sunday draw date.

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Import Winning Numbers Wizard

Import Winning Numbers wizard allows batch updates of winning numbers database by importing past draws from a text file or lottery web site. The import process consists of several steps.

1. Data Source

Select the source of past draws you want to import to winning numbers database. You can import either from

web site - enter the address of the web page with past winning numbers. The wizard will download that page and convert any HTML formatting and display it as plain text in the next step. Internet connection is required to use this feature.
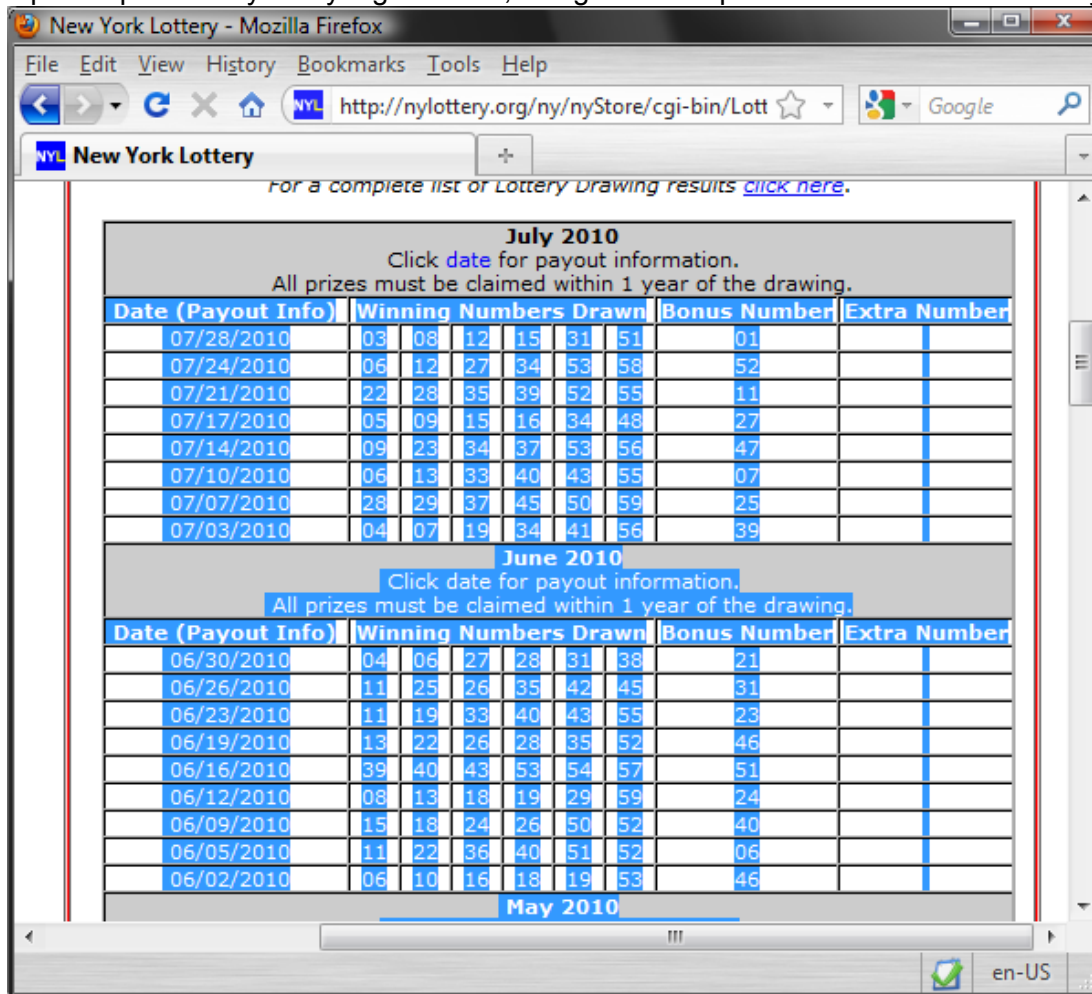
text file - click button *Browse* to select a plain text or CSV file with past winning numbers. The wizard will load the file and display its contents in the next step.

other sources - copy the text with past winning numbers you wish to import and paste it into this field.

▶ You can reuse settings from previous import session using *Use import profile* option. Most of the import settings will be already pre-select in wizard's window making the import process much smoother.

Example - LOTTO New York

Open http://www.nylottery.org web site, navigate to the past results for LOTTO lottery and select the table using your mouse:

Then press *CTRL+C* keyboard shortcut to copy the selected text to system clipboard. Switch back to Expert Lotto, click into the *Other* field and press *CTRL+V* keyboard shortcut to paste the text. The wizard window will look similar to this:
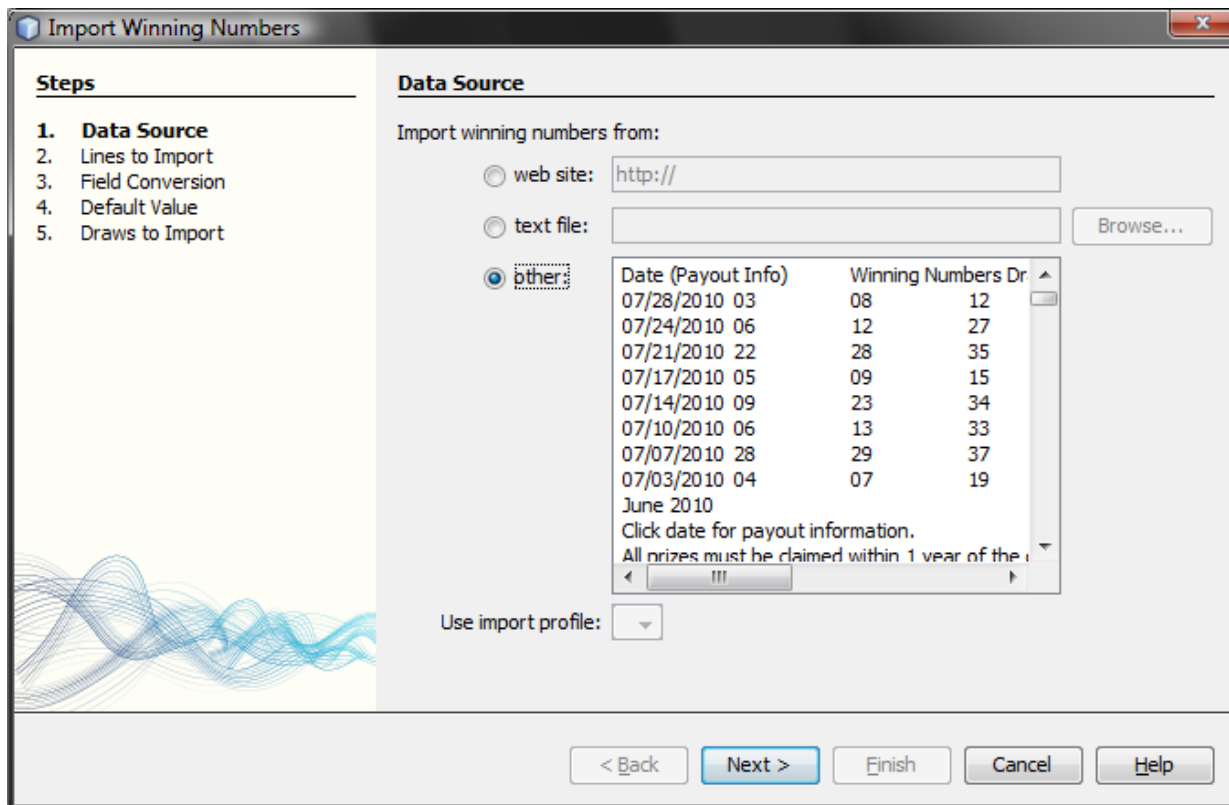
Click button *Next* to continue with wizard's next step.

2. Lines to Import

This step shows the imported text broken down into rows and columns. Each table row must have columns containing draw date fields and columns containing winning numbers. If the draw date value and winning numbers are in a separate rows you must tick option *Join every N lines into one line* to concatenate table rows.

Option *Show importable lines only* hides rows that do not have enough fields to be parsed as a valid past draw. If the wizard shows an empty table in this step, untick this option and join several table rows into one row before continuing with wizard's next step.

Import Winning Numbers

Steps

1. Data Source
2. **Lines to Import**
3. Field Conversion
4. Default Value
5. Draws to Import

Lines to Import

1	2	3	4	5	6
07	28	2010	03	08	12
07	24	2010	06	12	27
07	21	2010	22	28	35
07	17	2010	05	09	15
07	14	2010	09	23	34
07	10	2010	06	13	33
07	07	2010	28	29	37
07	03	2010	04	07	19
06	30	2010	04	06	27
06	26	2010	11	25	26
06	23	2010	11	19	33
06	19	2010	13	22	26

☐ Join every [2 ⇅] lines into one line.

☑ Show importable lines only

[< Back] [Next >] [Finish] [Cancel] [Help]

3. Field Conversion

Select table columns to be converted into past draws. Use the combo boxes at the bottom of the window to assign value type to each column in the table. You must pick table columns to convert as date fields and table columns to convert as the winning numbers before continuing with wizard's next step.
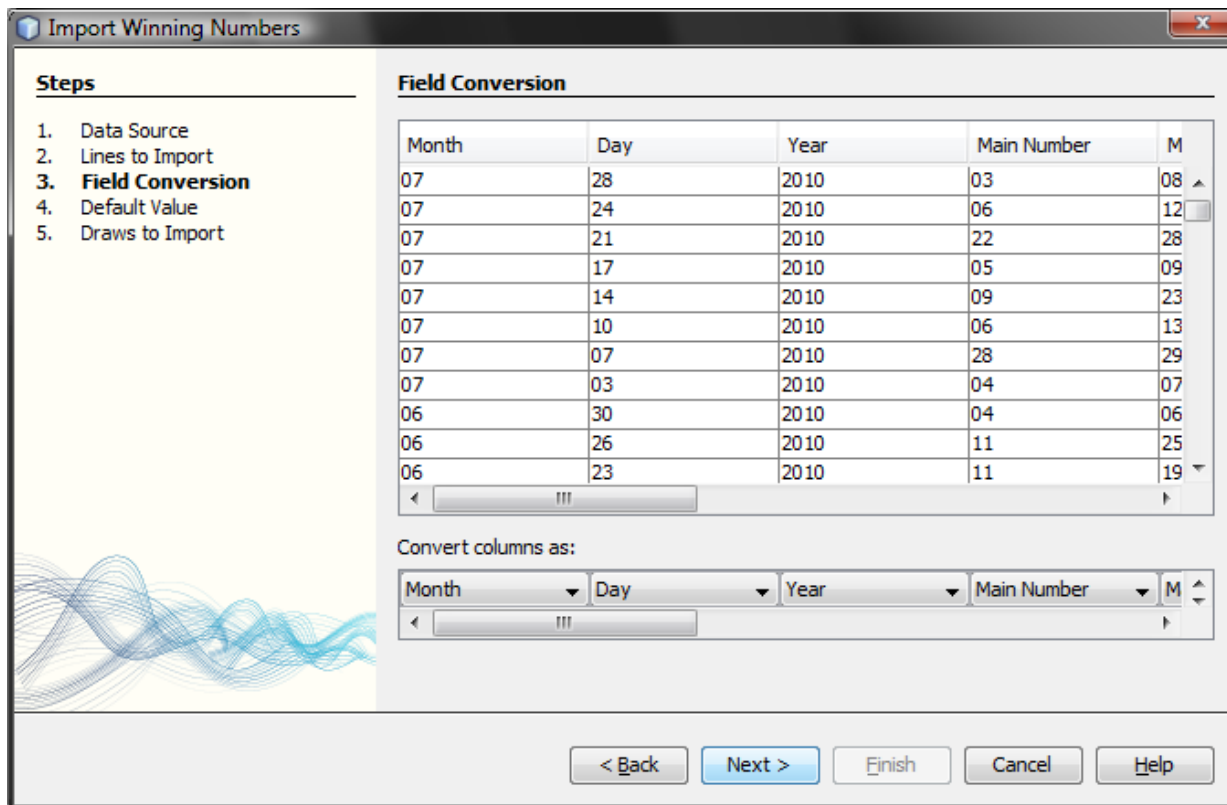
4. Default Value

In some cases the text being imported does not have to contain enough information. For example day of week or number set name may be missing. The wizard will prompt you in this step to select default values for the missing fields.

5. Draws to Import

The last step shows table of draws that were successfully parsed from import data. If the table is empty you must press button *Back* and correct your import settings.

Use option *Add new draws only* to import only draws missing in your winning numbers database. Use option *Also replace existing draws* to add new draws and also overwrite draws which already exist in your winning numbers database. There's a message at the bottom of this window showing how many draws will be added/modified in either case.

Option *Include out-of-schedule draws* allows importing draws with out-of-schedule draw date. Such draws are displayed in red color in the table.

▶ Select any draws in the table and press *Delete* key to remove them from the table. The removed draws will be excluded from the import.

Click button *Finish* to complete the import process and save the winning numbers database with new/modified draws to disk.
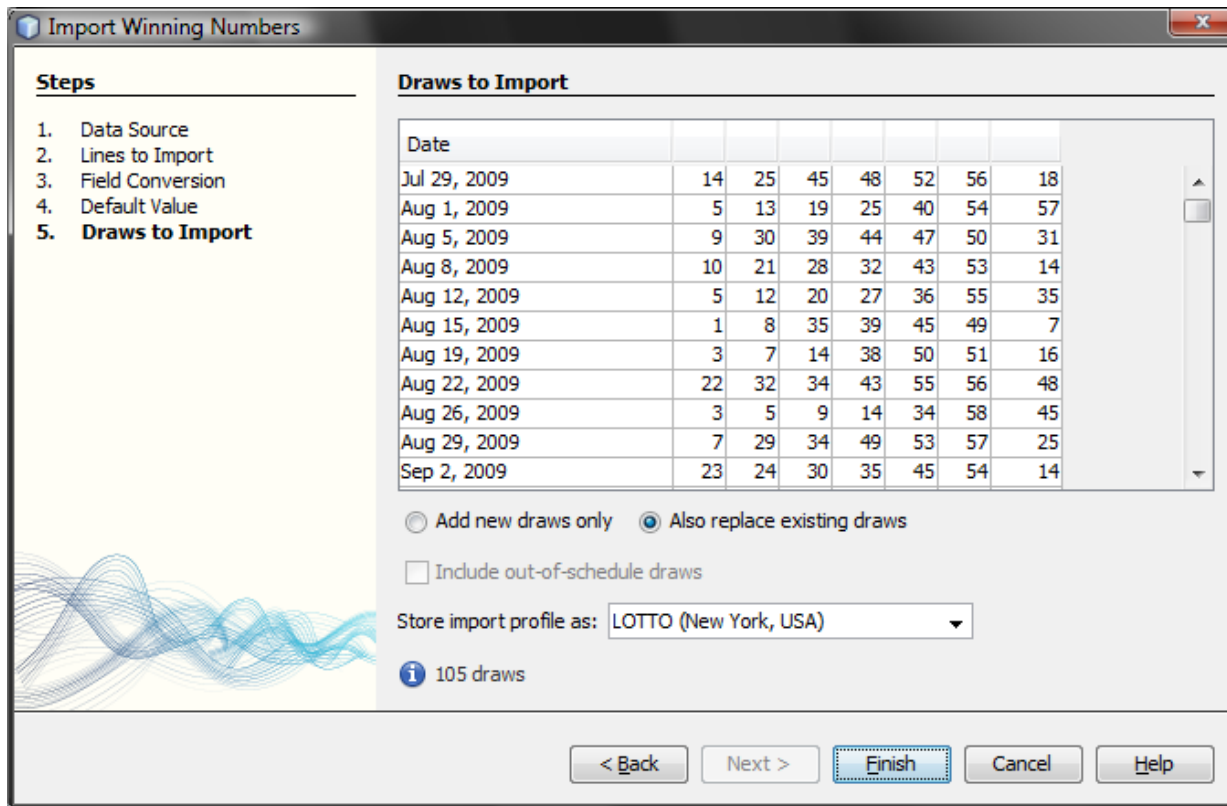
Winning Numbers Online Update

For some lotteries Expert Lotto provides built-in support for updating winning numbers online directly from lottery web site. Click menu *Winning Numbers - Online Update* to start *Winning Numbers Online Update* wizard. Internet connection is required to use this feature.

The first wizard screen lists online sources that match the settings of the current lottery - number pool size, draw schedule etc. The table shows the name of the lottery and the name of the country the lottery is being played in. If your lottery isn't listed in the table you cannot update winning numbers online and you must either add past draws manually or use Winning Numbers Import wizard.

You may email a request for a new online source to Expert Lotto development team by clicking button 🌐

Select the online source of past draws in the table and click button *Next* to continue. The wizard will connect to the lottery web site and download all available past draws. At the bottom of the wizard window you can see the download progress and the count of draws downloaded so far.

The next wizard window shows table of draws that were successfully downloaded. Use option *Add new draws only* to add only draws missing in your winning numbers database. Use option *Also replace existing draws* to add new draws and also overwrite draws which already exist in your winning numbers database. There's a message at the bottom of this window showing how many draws will be added/modified in either case.

Option *Include out-of-schedule draws* allows adding draws with out-of-schedule draw date. Such draws are displayed in red color in the table.

▶ Select any draws in the table and press *Delete* key to remove them from the table. The removed draws will not be added to winning numbers database.

Click button *Finish* to complete the update process and save the winning numbers database with new/modified draws to disk.

Note: The online update may fail for various reasons - there's no internet connection, the lottery web server doesn't respond, the web page with past draws has moved to a different location or the format of winning numbers archive on the lottery server has changed. You can send an email notification to Expert Lotto development team that the selected online source of past draws is broken. Click button 🔴 to open a new email window and describe in details the problem you're having with the selected online source.

<div align="right">

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Check Past Winnings

Menu command *Winning Numbers - Check Winnings* opens a new window where you can test any combination of numbers to see if it ever won any prize in the whole lottery history.
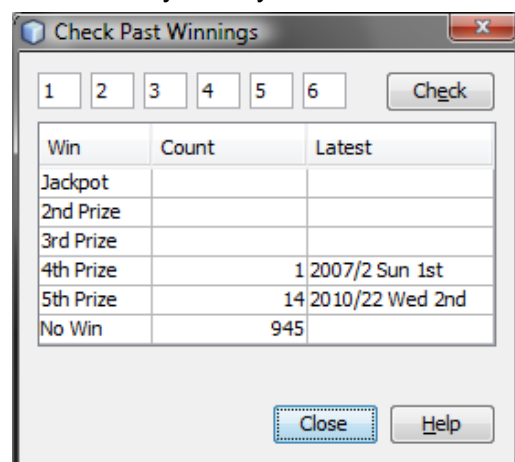
The screenshot above is from Expert Lotto 6/49 demo lottery and shows that combination of numbers *1-2-3-4-5-6* has one won one *4th prize* and 14 *5th prizes*.

The latest win of 5th prize happened in draw *2010/22 Wednesday 2nd*. In all other 945 draws in the winning numbers database this combination hasn't won anything.

▶ Edit field are pre-filled with current [What-If](#) numbers.

Predictions

The goal of all lottery strategies is the prediction of winning numbers that will hit in the next draw. Lottery players in most cases search for the most frequent or the least frequent numbers, then examine the latest winning numbers and/or their statistical properties trying to guess what is the most likely to happen in the next draw.

Expert Lotto has built-in tool which automates the prediction process to some extent. The application will search through selected past draws and compare them with the latest winning numbers to predict the numbers and statistical properties that are expected in the coming draw. As all other Expert Lotto features, the predictions are based on solid math. With the same input data and the same settings the predictor will always provide the same, reproducible results. There is no magical black-box spitting out different numbers each time it is clicked. Expert Lotto predictor is based on *pattern matching* algorithm which is widely used in many other computer-assisted fields – facial recognition, statistical data analysis, signal processing etc.

Pattern Matching

The following table lists 15 latest draws in Expert Lotto 6/49 lottery in descending order:

Date	Position 1	Position 2	Position 3	Position 4	Position 5	Position 6	Bonus
2010/28 Sun 2nd	23	29	36	42	44	47	7
2010/28 Sun 1st	6	13	14	19	41	42	29
2010/28 Wed 2nd	2	13	16	17	25	40	27
2010/28 Wed 1st	16	18	22	23	28	29	24
2010/27 Sun 2nd	1	6	12	24	32	41	44
2010/27 Sun 1st	2	15	22	29	30	37	42
2010/27 Wed 2nd	20	23	25	30	33	35	7
2010/27 Wed 1st	8	11	19	26	48	49	18
2010/26 Sun 2nd	8	11	18	32	36	38	6
2010/26 Sun 1st	5	6	11	31	40	43	32

2010/26 Wed 2nd	4	**18**	26	33	35	47	11
2010/26 Wed 1st	5	**12**	25	31	44	46	33
2010/25 Sun 2nd	10	**15**	28	30	36	43	35
2010/25 Sun 1st	16	**21**	24	25	35	46	47
2010/25 Wed 2nd	9	**12**	23	34	39	49	24

The latest three numbers at the second ticket position are: 13, 13 and 29. Those three numbers form the *latest pattern*. The pattern size is 3 as it consists of three numbers.

Now we will search the past winning numbers at the second ticket position and look for a similar pattern. The table above shows that the best *matching past pattern* can be found in draws *2010/26 Sun 2nd* to *2010/27 Wed 2nd*. The past winning numbers are 11, 11 and 23. The following draw is *2010/27 Sun 1st* where the second winning number is 15. So the prediction for the coming draw *2010/29 Wed 1st* is number 15 at the second ticket position.

Let's verify our prediction in Expert Lotto:

1. Open Expert Lotto 6/49 Demo lottery.
2. Click menu *Winning Numbers – Predictions* to open *Predictions* wizard window.
3. Choose *15 latest winning numbers* in the first step, click button *Next*.
4. Select *Pattern Matching* prediction type, click button *Next*.
5. Choose prediction settings as on the picture below. Click button *Next*.

6. Make sure *Ticket Positions* under *Positional statistics* is selected, click button *Finish*.

[Winning Number Properties](#) window opens and its table will show the following value in *Position 2* column:

Date	Numbers	Position 1	Position 2	Position 3	Position 4	Position 5	Position 6
Prediction		2	15	22	33	35	43
2010/28 Sun 2nd	23,29,36,42...	23	29	36	42	44	47
2010/28 Sun 1st	6,13,14,19,...	6	13	14	19	41	42
2010/28 Wed 2nd	2,13,16,17,...	2	13	16	17	25	40
2010/28 Wed 1st	16,18,22,23...	16	18	22	23	28	29

The downward red triangle indicates that the predicted trend is *decrease* in the next draw and the number predicted for the second ticket position is 15. See below for more instructions how to interpret the prediction results.

If we let the predictor scan the whole database of past winning numbers then it will find the best matching pattern in draws *2006/23 Sun 2nd* to *2006/24 Wed 2nd*. Their winning numbers are 12, 16 and 30. The following winning number at the second ticket position is 11. That means the predicted trend is again *decrease* and the predicted value is 11.

What happens if we increase the pattern size from three numbers to 10 numbers? The latest pattern is then 6,11,11,23,15,6,18,13,13,29. When displayed in a chart the numbers look like this:

The predictor will find best matching pattern in draws *2008/45 Sun 2nd* to *2008/48 Wed 1st* where the winning numbers are 9,20,13,21,12,8,15,15,4,27. The numbers in a chart look like this:

The following number at the second ticket position is again 11 (draw *2008/48 Wed 2nd*). That means the predicted trend is again *decrease* and the predicted value is 11.

If you compare the chart of the latest pattern and the chart of the found matching pattern above, you can see that the match is actually very loose. But it is still the best match the predictor can find in the whole database of past winning numbers. We cannot realistically expect to find a sequence of past winning numbers that is exactly the same as the ten latest draws. The longer the patterns are the less similarities between the latest pattern and the best matching pattern. So how to select the optimal pattern size?

In the examples above we used pattern size 3 which gave us predicted value 11 and pattern size 10 also with predicted value 11. In this case we have the same results. But what if the predicted values or even the predicted trends were different? How to tell which prediction is more credible?

The predictor runs a series of tests and selects the best pattern size automatically. Option *Latest draws for back-testing* in prediction settings screen defines how deep this back-testing is. If the prediction settings are for example *Pattern size min 3, max 15, Latest draws for back-testing: 10* then the predictor will make 130 predictions to pick the optimal pattern size. It will start with pattern size 3, make prediction for draw *2010/28 Sun 1st* and compare the predicted trend with actual value from the following draw *2010/28 Sun 2nd*. Then it will make prediction for draw *2010/28 Wed 2nd* and compare the predicted trend with the value from the following draw *2010/28 Sun 1st*. There will be 10 such testing predictions up to draw *2010/26 Wed 2nd*. The predictor will count how many predicted trends were correct when compared with the following draws.

Then the pattern size will increase to four and the predictor will make another ten testing predictions for ten latest draws. The count of correct trend predictions is noted. The pattern size is increased to five and the testing runs are repeated. This continues up to pattern size 15 as selected in prediction settings. Then the predictor will select the pattern size that had the highest count of correct trend predictions. This optimal pattern size is then used to make the actual prediction for the latest draw *2010/28 Sun 2nd*. In this case the best pattern size is 3 because seven trend predictions were correct during back-testing. When using pattern size 10, there were only 4 valid trend predictions out of the ten back-test runs.

▶ Hover mouse cursor above table cell with prediction result to see a tooltip with the best pattern size and the count of back-test predictions that were correct.

With option *Back-testing compares values* you can modify the prediction algorithm to select the pattern size that predicts values which are closest to the actual values when back-testing.

▶ Some lottery operators publish additional details about each draw – which set of balls has been used, which drawing machine etc. If the balls and/or machines are being changed at regular intervals it probably makes sense to use pattern sizes shorter than the interval between such changes.

Match Differences

The predictor has two modes of pattern matching. It can match either absolute values in a sequence of numbers as demonstrated above or it can match number differences instead. Let's have the following sequence of numbers:

31,35,13,20,15,5,2,10,4,25,3,10,5

Let's consider the last three numbers as the latest pattern: 3,10,5. When matching absolute values then the best matching pattern is 2,10,4 followed by number 45. However when matching number differences then the best matching pattern is 13,20,15 followed by number 5.

The same sequence of numbers expressed as value differences looks like this:

+31,+4,-22,+7,-5,-10,-3,+8,-6,+21,-22,+7,-5

So the latest pattern has changed to -22,+7,-5 and the best matching pattern is -22,+7,-5 corresponding to numbers 13,20,15 followed by number 5. So when matching differences the matching pattern must have the same shape (the order of increasing/decreasing values) as the latest pattern however all its values may be shifted up or down when compared with the latest pattern.

Now we will repeat the prediction for the second ticket number and use differences pattern matching instead of absolute values:

The best matching pattern are draws *2006/20 Wed 1st* to *2006/20 Sun 1st* with numbers 4,4,21, which translate to differences -3,0,+17. The following difference is -8.

The differences of the latest pattern are -5,0,+16. The predicted value is

29 – abs(-8 * (abs(-5/-3) + abs(0/0) + abs(16/17)) / 3 *) = 29 – 9.62 = 19.

Note that the predicted value includes correction which takes into account the differences between the latest and best matching patterns.

The same prediction with pattern size 10 will find the best matching pattern at draws *2009/24 Wed 1st* to *2009/26 Wed 2nd* where the numbers are 5,15,15,20,13,10,14,9,6,11 and the following number is 21. The prediction is *increase* to 46. This prediction is conflicting with the prediction with pattern size 3. However this prediction is a bit less credible as the back-testing passed in 5 out of 10 back test runs, while pattern size 3 predictions had 6 valid trend predictions during back-testing.

▶ It is recommended to use *differences pattern matching* especially for predictions of derived values like History sums and differences. Absolute values pattern matching is suitable for values with a small range, for example sum root, odd/even or the actual winning numbers at individual ticket positions.

Relaxed Pattern Matching

Pattern matching slider in *Predictions Options* window adjusts the weights of individual numbers when the patterns are being compared. When the slider is moved fully to the right then the pattern matching is strict and each number has the same weight.

Moving slider to the left relaxes the pattern matching as the numbers of the patterns being matched have lower weight when comparing them together. If the latest pattern is for example 6,11,11,23,15,6,18,13,13,29 then strict pattern matching may find for example pattern 9,20,13,21,12,8,15,15,4,27. With relaxed matching the best found pattern will be for example 33,16,25,14,31,11,18,12,16,30. As you can see the first few numbers of the best matching pattern match the latest pattern very loosely only. In both cases the predicted value is 10 however with relaxed pattern matching there were 9 valid back-test predictions while the strict matching produced only 7 valid predictions when back-testing on 15 latest draws. Relaxed pattern matching is recommend only when using larger pattern sizes (10 and more).

Using the Predictor

Predictions are available either from menu *Winning Numbers – Predictions* or from menu *History – Predictions*. Both menu commands start *Predictions* wizard.

1. In the first step select the past winning numbers draws to be scanned for matching patterns.
2. The second step in the wizard window selects the prediction method. Only the *Pattern Matching* algorithm is currently available.

3. The next step are options to customize the prediction algorithm. See above for more details.

4. The last step lists statistical or History values that can be predicted. Tick the items you are interested in and click button *Finish* to start the predictions.

You can track the progress of the prediction process at the lower right corner of the main window. When the process is finished the prediction results are available in Winning Numbers Properties and Winning Numbers Charts windows or in Summary History window under *Sums* and *Charts* tabs.

Interpreting the Results

 – blue triangle indicates that the predicted trend is *increase*. That means the next value is expected to be greater than the latest value. The actual predicted value is also available.

 – red triangle indicates that the predicted trend is *decrease*. That means the next value is expected to be lower than the latest value.

 – when both red and blue triangles are present in table cell then the predicted trend is *level*. That means the next value is expected to be the same as the latest value.

Note: The predictions algorithm operates just with a sequence of numbers. In some cases the predicted value can be lower or higher than the minimum or maximum possible values. In such cases you should consider the predicted trend only.

Value *n/a* in prediction results means it was not possible to make valid prediction. Usually because there are not enough data to select the matching pattern.

▶ The predicted trend should be the main indicator when estimating values for the coming draw. The actual predicted value should be only a hint showing how big the predicted increase or decrease is.

Hover mouse cursor over predicted cell to see a tooltip with additional information regarding the prediction. You can see how many back-test predictions were correct and the pattern size that has been used for predictions.

▶ It is recommended to ignore predictions with low percentage of successful back-test by entering required percentage of successful back-test into the last input field.

Additional Information

Detailed information about the prediction process is available in *Application Log*. When the predictions are finished click menu *View – Application Log*. The *Output* window then shows the following details for each predicted value. For example:

Position 2 – name of the predicted value. In this case it is the winning number at the second ticket position.

Trend prediction: Decrease – predicted trend (increase/decrease/level)

Predicted value: 10.0 – the actual predicted value. Please note that all values are zero-based so the predicted winning number is 11.

Best pattern size: 5 – the pattern size used for the prediction.

Best weight: 1.0 – the weight used for pattern matching. The weight is always 1.0 unless relaxed pattern matching has been used.

Matching pattern: [10.0 17.0 11.0 15.0 29.0] => 10.0 – the best matching pattern found. In the case the best pattern are numbers 11,18,12,16,30. The number following this pattern is 11.

Marker: 94 – the position in the sequence of numbers where the best matching pattern has been found. Value 0 means the oldest draw.

Back-tests: 15 – the count of back tests that have been carried out to validate the pattern size.

Mean Square Error: 107.66666666666667 – shows how much the back-test prediction values differ from the actual values. The lower [MSE](#) the more accurate the back-test prediction values are.

Mean Absolute Percentage Error: 0.6399601052542229 - [MAPE](#) indicator also compares the back-test predictions with the actual values.

Valid trend predictions: 6 (40.0%) - how any back tests produced correct trend prediction.

See also [Trend Predictions](#) filter.

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Winning Numbers - Table

Winning Numbers Table window opens from menu *Winning Numbers - Show As - Table* and displays selected draws from winning numbers database as a plain table. Table rows are individual draws, table columns are winning numbers. The first table column shows draw date. Click the *Date* column header to sort the list of draws in ascending or descending order.

Click button *Select* at the top of the window to display a different selection of past draws in the table.

When one or more draws are selected in the table the following changes happen in application's user interface:

- [Number Coloring](#) is activated to highlight occurrences of numbers in selected draws. This change is propagated to other application windows, including *Winning Numbers Table* window.
- [Ticket Panel](#)window shows the numbers of a single selected draw.
- [Ticket Properties](#)window calculates statistical properties of a single selected draw.
- [What-If](#)toolbar displays numbers of a single selected draw. This change is propagated to other application windows that show *What-If* numbers.

Click menu *File - Export* or menu *File - Print* to export the table contents to a file or to print the table respectively.

▶ Use menu *Edit - Find* to search for a draw with given numbers. Use menu *Edit - Delete* to remove currently selected draw(s) from the table. **Note:** *Delete* action does **NOT** delete draws from winning numbers database. It only removes selected draws from the table. You can click button *Select* to display removed draws in the table again.

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Winning Numbers Matrix

Winning Numbers Matrix window opens from menu *Winning Numbers - Show As - Matrix* and displays selected past draws as a matrix of all pool numbers. Matrix rows are individual draws, matrix columns are pool numbers. There are several layouts of pool numbers available. You can switch to a different layout using *Matrix Layout* combo box at the bottom of *Winning Numbers Matrix* window.

The first matrix column shows draw date. Hover your mouse above this column to see draw date and its winning numbers in a tooltip. Click the Date column header to sort the draws in ascending or descending order.

An important feature of *Winning Numbers Matrix* window is the highlighting of pool numbers to improve the visual perception of past winning numbers.
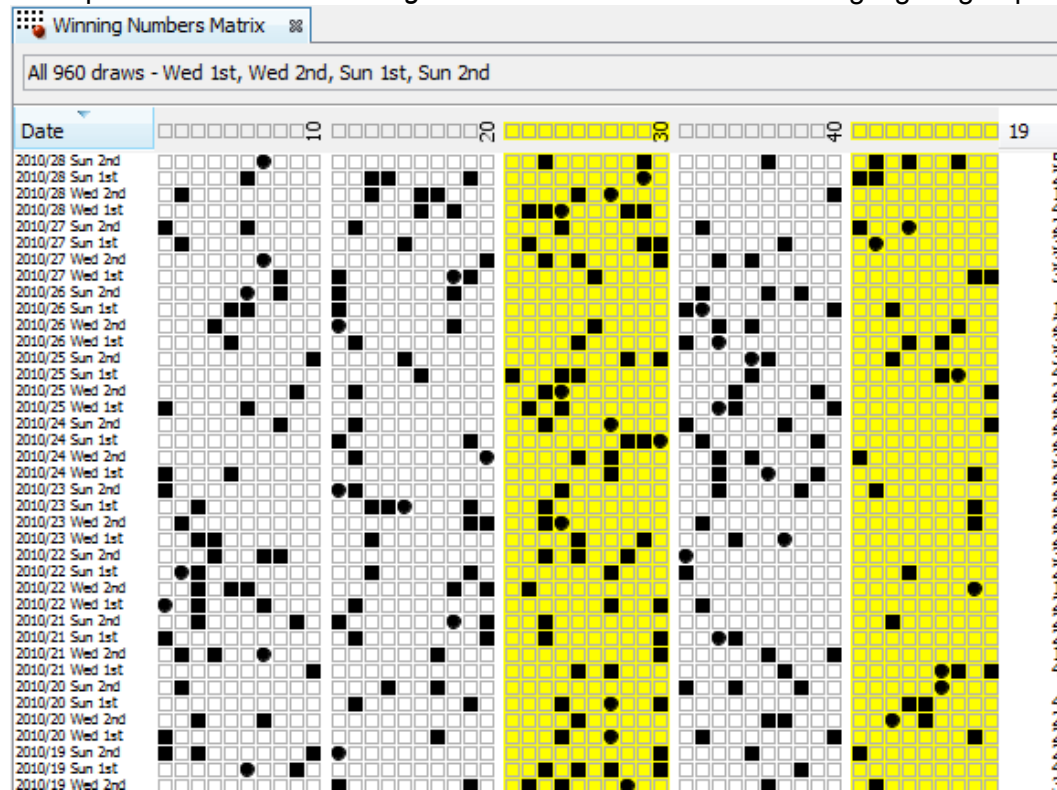
The picture above shows the latest draws from Expert Lotto 6/49 demo lottery. Numbers 21 to 30 and numbers 41 to 49 are highlighted - their cells have yellow background. Note that the last column in matrix header displays the count of highlighted numbers. Also the last column on each matrix row shows how many highlighted numbers each ticket contains.

There are several ways to highlight numbers in the matrix:

- Click individual cells in matrix header to switch the highlight of the number the cell represents on/off. Note that a tooltip shows pool number corresponding to the header cell under mouse cursor.
- Click numbers in [Ticket Panel](#)window to toggle their highlight on/off.
- Click and drag mouse cursor to highlight several numbers at the same time.
- Click and drag mouse cursor while holding down *CTRL* key to remove highlight from the cells under cursor.

- Double-click the last column in matrix header to remove all highlights.
- Select one or more draws in the matrix and click *Highlight Selection* button at the bottom of *Winning Numbers Matrix* window. This highlights all numbers from selected draws.

After highlighting one or more pool numbers you can filter the draws in the table by clicking *Filter* button at the bottom of this window. This removes all draws from the table that contain the selected count of highlighted numbers. The draws are **NOT** removed from your winning numbers database - make a new selection of past draws by clicking button *Select* at the top of the window to see the removed draws again in this table.
Button *Match Summary* opens a window showing summary count of draws with highlighted numbers.

When one or more draws are selected in the matrix the following changes happen in application's user interface:

- Number Coloring is activated to highlight occurrences of numbers in selected draws. This change is propagated to other application windows, including *Winning Numbers Matrix* window.
- Ticket Panel window shows the numbers of a single selected draw.
- Ticket Properties window calculates statistical properties of a single selected draw.
- What-If toolbar displays numbers of a single selected draw. This change is propagated to other application windows that show *What-If* numbers.
- *Highlight Selection* button at the bottom of *Winning Numbers Matrix* window is enabled.

Click menu *File - Print* to print the matrix, click menu *File - Export* to export the table content to a file.

▶ If the matrix table is too wide for your screen or too small for your eyes you can resize it using the slider at the bottom of the window.

▶ Use menu *Edit - Find* to search for a draw with given numbers. Use menu *Edit - Delete* to remove currently selected draw(s) from the matrix. **Note:** *Delete* action doesn't delete draws from winning numbers database. It only removes selected draws from the matrix. You can click button *Select* to display removed draws in the matrix again.

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Winning Numbers Properties

Menu command *Winning Numbers - Show As - Properties* opens *Winning Numbers Properties* window showing a table of statistical properties of selected past draws. Each table row represents one draw, each table column corresponds to a statistical property. Click *Select* button to choose past draws to be displayed in this table. You can customize table columns using menu *Tools - Options - Statistics*.
The top-left corner of this window shows *Columns* button which opens Select Columns window where you can choose which statistical properties should show in this window. It can be useful when there are too many table columns.

▯▯ - toggles different background color for each table column for better visual perception. The colors are adjustable in application settings.

▯▯ - toggles same background color for table cells where the value matches the values in currently selected row. The colors are adjustable in application settings.

▶ Click menu *Winning Numbers - Predictions* to run automated predictions of future values of displayed statistical properties.

- You can change the order of draws in this table by clicking *Date* column header. You can drag column headers to reorder table columns, drag column header borders to resize table columns.
- Click menu *File - Export* to export the table to CSV or MS Excel file.
- Use menu *Edit - Find* to search for a draw with given numbers. Use menu *Edit - Delete* to remove currently selected draw(s) from the table. **Note:** Delete action does **NOT** delete draws from winning numbers database. It only removes selected draws from the table. You can click button *Select* to display removed draws in the table again.

See also Winning Numbers Charts.

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Winning Numbers Charts

Menu command *Winning Numbers - Show As - Charts* opens *Winning Numbers Charts* window showing statistical properties of selected past draws in a chart. Click *Select* button to choose past draws to be displayed in the chart. Use *Show* combo box to switch the chart content to a different statistical property.

You can compare the trend of currently selected statistical property with other properties. Click button *Compare With* at the top of this window to open a new dialog window listing all available charts. Tick the statistical properties you wish to compare the current chart with and the press *OK* button. This way you can display for example the chart showing *Ticket Sum* values and the chart showing *Sum Root* together.

- Hover mouse cursor above any chart point to see draw date and numerical value associated with that point.
- Click any chart point to see winning numbers from the corresponding draw date in Ticket Properties and Ticket Panel windows respectively.
- Click menu *Winning Numbers - Predictions* to run automated predictions of future values of displayed statistical properties.
- You can export the chart as a JPG or PNG image using menu *File - Export*.

See also Winning Numbers Properties.

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What is Package?

Package is some sort of storage locker which keeps the tickets you are currently working with. It is the place where you for example load the tickets to check if you won anything in the previous draw. The Package can hold a full wheel of all possible combinations which can be filtered down to an affordable number of

tickets. The Package lets you check the win guarantee of a wheel you've downloaded from internet. You can save the tickets in the Package to a file to share them with your friends. You can print Package tickets directly to paper playslips etc. There are many application features dedicated to working with Package tickets.

There are several different views available to see tickets in the Package :

- [Plain table](#) - the Package content is presented as a table where each row is a single ticket and table columns contain ticket numbers.
- [Matrix](#) - is a table showing all pool numbers in various layouts and how tickets numbers fall into the selected layout.
- [Statistical properties](#) - shows Package tickets in a table together with some statistical [properties](#) like the ratio of odd/even ticket numbers, the sum of ticket numbers etc.
- [Winnings](#) - shows a table of tickets and the count of ticket's winnings for selected range of past draws.

You can fill the Package from different sources:

- [Custom number combinations](#) - enter ticket numbers using keyboard.
- [Ticket file](#) - load tickets from a text file or CSV file (e.g. when downloading a wheel from internet). Or open a ticket file in Expert Lotto's disk space saving binary format.
- Combinations of [randomly generated](#) numbers.
- Generate a [full wheel](#) listing all possible combinations of selected numbers.

▶ When inserting tickets into the Package you can combine them with the current Package contents in several ways - just click the little down arrow on *Insert* button**:**
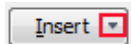
Insert ▾

- **Insert** - the default action - replaces the current Package contents with the new tickets.
- **Append** - adds the new tickets to the end of current Package contents. This may lead to the duplication of some tickets. Click menu *Package - Remove Duplicates* to ensure that each ticket is present in the Package only once.
- **Merge** - combines the new tickets with the current Package contents to avoid creation of duplicated tickets.
- **Remove** - removes the new tickets from the current Package contents.

It is possible to revert all Package operations using *Undo/Redo* actions. For example when you see that a filter you've just applied removed too many tickets, click menu *Edit - Undo* to restore tickets in the Package into the same state as before running the filter. Then you can use the filter again with different settings.

To remove all tickets from the Package click menu *Package - Clear*.

▶ When a Package operation is finished you can see how many tickets were removed/added/filtered out on application's status line at the bottom of the main application window.

▶ The Package content is restored after application restart and also when switching to/from a different lottery.

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Insert Tickets

This action allows entering ticket numbers from keyboard.

1. Click menu *Package - Insert - Tickets* to open *Insert Tickets* window.
2. Enter the numbers into edit fields and click *Add* button.
   Note: Enter a star sign (*) into any field to [mask](#) the given position.
3. You can enter numbers for a different ticket and click *Add* button again. Alternatively you can select ticket numbers in the [ticket panel](#) using your mouse.
4. This way you will create a list of tickets that will be inserted to the *Package*. If you made a mistake and entered wrong ticket numbers you can select the ticket(s) in the list and press *DELETE* key to remove it from the list.
5. When you are finished with entering ticket numbers click button *Insert* to load the tickets into the Package.

▶ Click the little down arrow on *Insert* button to open a menu where you can choose a different method of loading tickets into the Package:

Insert
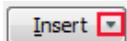
You can also press *SHIFT+SPACE* key when the button has input focus to open that menu.

▶ You can select a table of numbers in e.g. MS Excel or in a plain text CSV file and copy it to system clipboard. Then click *Paste* button at the lower left corner of this window to add the copied numbers to the list of tickets to be inserted into the Package.

▶ When entering ticket numbers from keyboard prepend single-digit numbers with zero to automatically move input focus into the next number field. For example enter "01" instead of "1".

▶ You can click button at the top left corner of this window to clear all numbers selected on the ticket panel.

Insert Ticket File

This action loads the Package with tickets from selected file. Clicking menu item *Package - Insert - Ticket File* first brings up a standard file browser window. Find the file you wish to insert into the Package and click *Open* button to open *Insert Ticket File* window with the selected file.

In this window you can choose whether you want to insert *tagged* tickets only or *untagged* tickets only or both. You can also select a different file by clicking *Browse* button.

Click *Insert* button to load the tickets from the selected file into the Package. When the loading is finished you'll see a message in main window's status bar showing how many tickets have been inserted and the name of the file the tickets come from.

▶ Click the little down arrow on *Insert* button to open a menu where you can choose a different method of loading tickets into the Package:
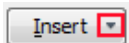
[Insert ▼]

You can also press *SHIFT+SPACE* key when the button has input focus to open that menu.

To insert a previously used file you can go to menu *Package - Insert Recent File*.

▶ You can also drag and drop a ticket file into application's main window to open *Insert Ticket File* window with the dropped file already preselected.

▶ The name of the last used file shows in the status bar of Package Table, Package Properties and Package Winnings windows.

Random Numbers

Menu command *Package - Insert - Random Numbers* opens the generator of random numbers to insert tickets with random numbers into the Package.

Jackpot & Keno

Select the count of tickets to be generated in the first field. Then choose how many random numbers each ticket will have. If you select less than the maximum count of numbers then the remaining ticket positions will be masked. The next option is the size of the pool the numbers will be randomly picked from. Use your mouse to pick pool numbers on the ticket panel.

▶ Click and drag the mouse cursor to continuously toggle the selection of panel numbers under the cursor. Hold down *SHIFT* key while dragging mouse in the panel to select numbers under the cursor, hold down *CTRL* key while dragging to deselect number under the cursor.

Click *Insert* button to generate the random combinations and load them into the Package. When the generator is finished you'll see a message in main window's status bar showing how many tickets have been inserted.

▶ Click the little down arrow on *Insert* button to open a menu where you can choose a different method of loading tickets into the Package:

[Insert ▼]

You can also press *SHIFT+SPACE* key when the button has input focus to open that menu.

Example

Random Numbers

Create **20**

random combinations of **4** numbers

from a pool of **15** numbers.

Pool Numbers:

1	2	3	4	5
6	7	✖	9	✖
11	✖	✖	14	15
✖	17	18	19	✖
21	22	23	24	✖
✖	27	✖	29	30
31	32	33	34	35
36	✖	38	✖	✖
41	42	43	44	✖
✖	47	✖	49	

Maximum overlap: **4** number(s)

Selected combinations require 140 B of free disk space.

Insert ▾   Cancel   Help
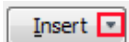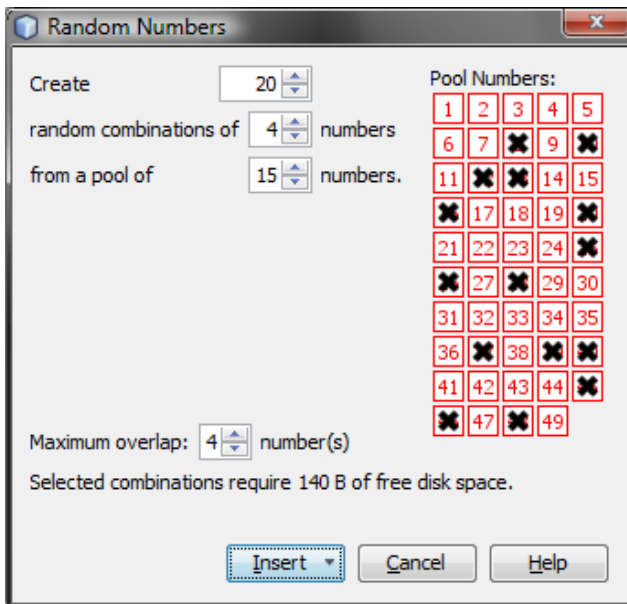
The settings in the picture above create 20 tickets with random numbers. Each ticket will have 4 numbers from a pool of 15 numbers. The pool numbers are selected on the ticket panel: 8,10,12,13,16,20,25,26,28,37,39,40,45,46 and 48.

Such tickets inserted into the Package will look similar to this:

16	28	40	48
26	37	40	48
8	26	37	45
13	20	39	40
25	28	39	48
12	13	28	37
13	16	39	45
25	26	40	48
12	37	39	48
12	13	40	46
10	13	28	40
13	16	26	37
8	10	28	37
16	25	28	39
10	12	20	40
16	40	45	46
12	16	45	48
13	26	45	48
8	13	25	46
10	16	26	48

Note that the last two ticket positions are masked because only 4 ticket numbers were selected in *Random Numbers* window.

Create PDF in your applications with the Pdfcrowd HTML to PDF API

PDFCROWD

Option *Maximum overlap* defines how many numbers in each generated ticket may match numbers in other tickets. Try for example the following settings in Expert Lotto 6/49 demo lottery:
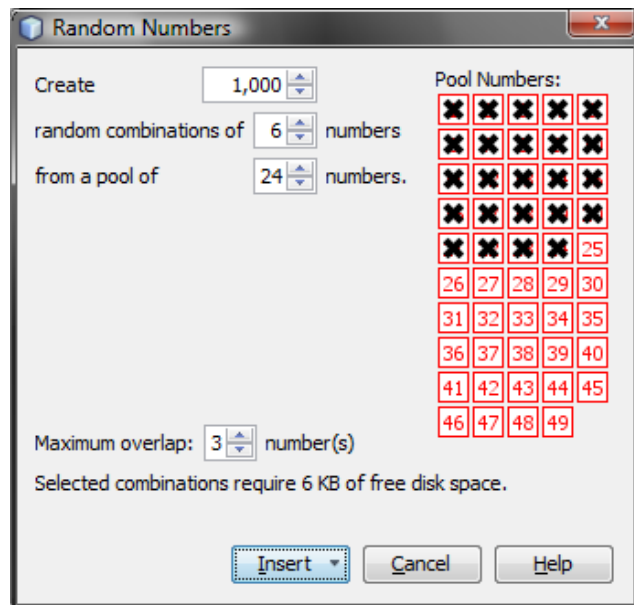
After clicking *Insert* button you will see a progress bar at the lower right corner of the main application window. Eventually the progress bar will get stuck at about 28%. That is because there are not that many tickets matching each other in three numbers at most. Click the progress bar to show task details and you will see that about 280 to 290 tickets were generated so far. The application is now trying to lookup the remaining random combinations it was ordered to create. However all other random tickets now match the previously generated ones in more than three numbers so the process is stalled. Click the little abort button next to the progress to cancel the ticket generator and load into the Package all tickets generated so far. Now the Package tickets may include numbers like **1-2-3**-4-5-6 and **1-2-3**-7-8-9 because the two tickets match each other in three numbers. But there will never be tickets like these in the Package: **1-2-3-4**-5-6 and **1-2-3-4**-7-8, because both tickets match each other in 4 numbers while the *maximum overlap* was set to **3** numbers.

▶ A message at the bottom of the window shows the disk space required to create the selected count of random combinations.

Powerball

Random Numbers generator looks almost the same when playing a Powerball-like lottery. The window has just another field to adjust the size of powerball pool. Also the ticket panel has boxes for selection of numbers for the powerball pool. All other options are the same.

Note: *Maximum overlap* option applies to the main ticket numbers only.

Pick 3 & Pick 4

When playing a *Pick 3* or *Pick 4* lottery the *Random Numbers* window differs a little. There are options to select the size of each number pool. Untick number pool check box(es) to mask appropriate ticket positions. All other options are the same.

Full Wheel

Menu command *Package - Insert - Full Wheel* opens a new window to insert all possible combinations of selected numbers into the Package.

Jackpot & Keno

Select the count of tickets to be created in the first field or press button *All* to create all possible combinations of selected numbers. For example in a 6/49 lottery there are 13,983,816 possible combinations. Entering e.g. 100 into the first field will create only the first one hundred such combinations starting with 1-2-3-4-5-6 and ending with 1-2-3-4-7-20.
Then choose how many numbers each ticket will have. If you select less than the maximum count of numbers then the remaining ticket positions will be masked.
The next option is the size of the number pool. Use your mouse to pick pool numbers on the ticket panel.

▶ Click and drag the mouse cursor to continuously toggle the selection of panel numbers under the cursor. Hold down *SHIFT* key while dragging mouse in the panel to select numbers under the cursor, hold down *CTRL* key while dragging to deselect numbers under the cursor.

Click *Insert* button to create the selected combinations and load them into the Package. When the generator is finished you'll see a message in main window's status bar showing how many tickets have been inserted.

▶ Click the little down arrow on Insert button to open a menu where you can choose a different method of loading tickets into the Package:

Insert ▼
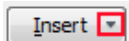
You can also press *SHIFT+SPACE* key when the button has input focus to open that menu.

Example
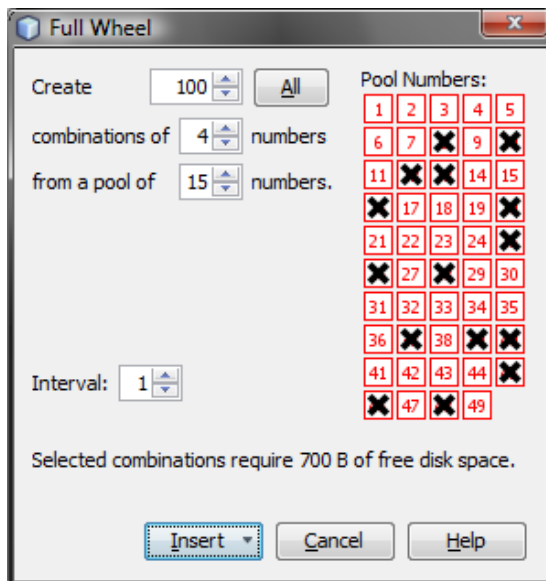
The settings in the picture above create 100 tickets, each with four numbers from a pool of 15 numbers. The pool numbers are selected on the ticket panel: 8,10,12,13,16,20,25,26,28,37,39,40,45,46 and 48.

Such tickets inserted into the Package will look exactly like this:

Note that the last two ticket positions are masked because only 4 ticket numbers were selected in the *Full Wheel* window.

In some cases there are too many tickets to create a full wheel from a selected number pool. For example in 10/80 Keno lottery there are 1,646,492,110,120 possible combinations. Creating such a full wheel would require about 16TB of free disk space which is way above the limits of todays computers. That's where the *Interval* option comes in. You can use it to create every N-th ticket from the full wheel to save the required disk space. Try for example the following settings

in Expert Lotto 6/49 demo lottery:
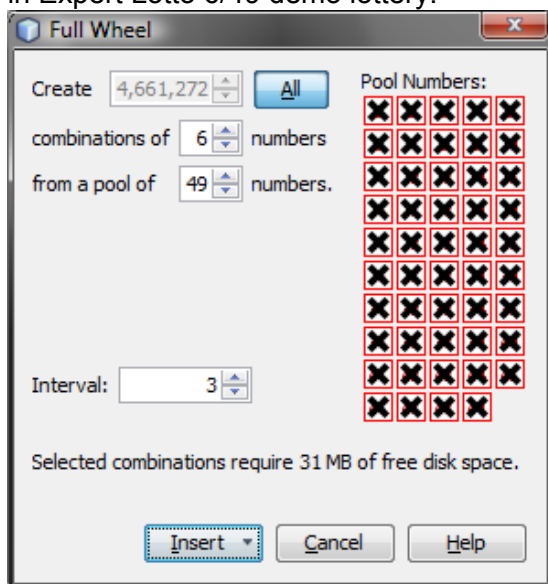
The tickets in the Package will look like this then:

The full wheel of 49 numbers starts with combinations:

1-2-3-4-5-6
1-2-3-4-5-7
1-2-3-4-5-8
1-2-3-4-5-9
1-2-3-4-5-10

... and ends with:

43-44-45-46-47-48

43-44-45-46-47-49

43-44-45-46-48-49

43-44-45-47-48-49

43-44-46-47-48-49

43-45-46-47-48-49

44-45-46-47-48-49

However with *Interval* option set to 3 only every third ticket from the full wheel will be created. Such tickets are highlighted with red color in the list above. This option is especially useful for Keno-like lotteries as it provides good coverage of any full wheel while decreasing free disk space demands.

▶ A message at the bottom of the window shows the disk space required to create the selected full wheel.

Powerball

Full Wheel window looks almost the same when playing a Powerball-like lottery. There is just another field to adjust the size of powerball pool. Also the ticket panel has boxes for selection of numbers for the powerball pool. All other options are the same.

Pick 3 & Pick 4

When playing a *Pick 3* or *Pick 4* lottery the *Full Wheel* window differs a little. There are options to select the size of each number pool. Untick number pool check box(es) to mask appropriate ticket positions.

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Analyze Tickets in the Package

Menu *Package - Analyze* starts Tickets Analyzer wizard to calculate summary statistics for the tickets in the Package. In wizard's first step you can choose past draws to be analyzed for intervals. In the next wizard step then select which statistics should be calculated. Clicking *Finish* button opens Analyzer window showing tables and charts for selected statistics. You can open as many *Analyzer* windows as you want using this menu command.

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Reduce Package

There are many types of lottery strategies. But one of the common approaches is to start with the list of all possible combinations and then remove some combinations that (don't) have required statistical properties and/or (don't) match some of the latest draws. This combination filtering is repeated until an affordable collection of combinations/tickets is achieved.

You can insert into the Package the list of all possible combination using menu *Package - Insert - Full Wheel*. Then use menu *Package - Reduce* to remove some tickets the Package:

- **Filter Tickets** - opens Filters window where you can pick any filter from a growing list of specialized ticket filters.
- **Mutual Match** - compares all tickets in the Package with each other and removes/keeps only those matching other tickets in the selected count of numbers.
- **Optimize Coverage** - removes surplus tickets from the Package while maintaining given win guarantee.
- **Best Tickets** - selects several tickets that provide the best representation of the whole Package.
- **Random Selection** - randomly picks some tickets from the Package.
- **Systematic Selection** - selects every N-th ticket from the Package.

Package filtering is also available from:

- Complex Filter windows.
- Statistical tables in Analyzer windows.

Note: You can also remove hand-picked tickets from the Package by selecting them with your mouse in any Package window and then using menu command *Edit - Delete*.

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Filtering Tickets

There is one sure way to win the lottery Jackpot - play all possible combinations. However the payouts are never so big to return the cost of such a huge bet, not to mention the time needed to fill out so many playslips. Most lottery players have limited betting budget so they play a small wheel only. Depending on your lottery strategy you can download a wheel from internet or create a new one from scratch by filtering down the whole set of all possible combinations. The filtering process excludes combinations - *tickets* - that are not expected to win in the next draw. It is either a manual process of going through the tickets one by one and removing those you don't like or it can be done in bulk by applying *ticket filters*.

Ticket filter is a simple *yes/no* condition. A filter *accepts* a ticket when the ticket numbers meet filter's condition, filter *rejects* a ticket if the ticket doesn't meet filter's condition. The filter condition can be either a simple check for desired ratio of odd and even numbers or the filter can compare ticket numbers with past draws or it can be a complex hierarchy of other simple filters.

Package Filtering

To filter tickets in the Package, click menu *Package - Reduce - Filter Tickets*. Then select the filter you wish to apply to Package tickets and click *Select* button to open the selected filter. A new window opens where you can enter the settings of selected filter. At the bottom of the filter window there are buttons to run the filter:

- **Matching Tickets** - with option *Accept* the filtered Package will contain tickets that meet filter settings. Option *Reject* reverses the filter condition so the filtered Package will contain only tickets that don't pass the filter settings.
- **OK** - applies the filter to the Package tickets and closes the filter window. You can track the filter progress at the bottom of the main application window. To abort the filter, click the *Abort* button next to the filter's progress bar.
- **Apply** - applies the filter to the Package tickets and keeps the filter window opened. When the filter is finished you can adjust filter settings and apply the filter again. To abort the filter, click the *Abort* button next to the filter's progress bar.
- **Preview** - counts how many Package tickets the filter accepts and how many tickets the filter rejects without any actual changes to the Package contents.
- **Cancel** - closes the filter window.

To revert the filtering results, click menu *Edit - Undo* to return the Package to the same state as before filtering.

When *OK* or *Apply* button is clicked in the filter window then the current filter settings are remembered and reused as the default settings when the filter is opened again.

If you play a lottery that draws one or more bonus numbers from the same pool as the main numbers it is possible to modify the selection of past draws in filter window to merge the bonus number(s) into the main numbers. This option is available only when filtering Package tickets using a single filter. It isn't possible to merge bonus numbers with main numbers in *Complex Filter* window.

Complex Filters

Implementing an advanced lottery strategy usually requires a lot of ticket filtering. Complex Filters allow grouping of frequently used simple filters together and applying them in a single step. *Complex Filters* can be stored to a file and reopened on next application startup. Another advantage of *Complex Filters* is that they support building of a deep hierarchy of simple filters with *AND/OR* logical operators. *Complex Filters* can be also back-tested and their performance is easily evaluated.

Mutual Match

This filter opens from menu *Package - Reduce - Mutual Match*. The filter compares all tickets in the Package with each other. If there are for example 10 tickets in the Package then the first ticket will be compared with tickets 2 to 10, the second ticket will be compared with tickets 3 to 10, the third ticket will be compared with tickets 4 to 10 etc.

Example

Let's assume the Package contains the following tickets:

01-02-03-04-05-06
01-02-03-08-09-10
01-02-03-31-32-33
01-22-23-24-25-16
01-22-23-24-25-26

- Filtering with settings *Match 3* will leave only two tickets in the Package - the first one (01-02-03-04-05-06) as it matches the following two tickets in three numbers 1, 2 and 3 and the second one as it matches the following ticket in the same three numbers.
- Filtering with settings *Match 3, Min 2* will leave only the first ticket in the Package as it matches two other tickets in the Package in three numbers.
- Filtering with settings *Match 3, Max 1* will leave only the second ticket in the Package as it matches one other Package ticket in three numbers.

Package Optimizer

This filter removes surplus tickets from the Package while maintaining the selected win guarantee. The filter opens from menu *Package - Reduce - Optimize Coverage*. You can use the filter either to create *optimized wheels* or to filter the result of your lottery strategy to *reduce the cost* of your bet.

Wheels

Wheels with a win guarantee are usually described as "x if y (n)". Where "x" is the lowest guaranteed match when "y" winning numbers are drawn from "n" numbers the wheel is created from. For example wheel "3 if 6 (20)" guarantees at least one *match 3* prize when any 6 numbers out of pool's 20 numbers hit in the next draw. The smallest possible wheel with such win guarantee contains ten tickets. It means you must bet at least 10 tickets if you want to win at least one match 3 prize. All six winning numbers must come from the twenty numbers the wheel is combined from.

Example

Use the following steps to create an optimized wheel from 20 numbers with 3 if 6 win guarantee in Expert Lotto 6/49 Demo lottery:

1. Use menu *Package - Insert - Full Wheel*.
2. In Full Wheel window select *Create all combinations of 6 numbers from a pool of 20 numbers. Interval: 1*
3. Click button *Insert* to insert the full wheel into the Package. The Package will contain 38,760 tickets.
4. Use menu *Package - Reduce - Optimize Coverage* to open this filter window.
5. Select *I want to have 100% guarantee of matching at least 3 winning numbers when I hit any 6 numbers. Algorithm preference: smaller resulting wheel*
6. Click button *OK* to start the filter. The filter window will close and you can track the filter progress at the lower right corner of the main window.
7. The filtering may take several minutes to finish, depending on how fast your computer is and how many execution cores your CPU has.
8. When the filter is finished, you will see the filtered tickets in the Package. There will be approximately 14 tickets left.

9. Use menu *Package - Coverage* to calculate the win guarantee of the optimized wheel.
10. Select *Show my winnings when I hit 6 numbers* and click button *Show*.
11. You will see that the lowest possible win is one *Match 3* prize.

Note that the resulting optimized wheel consists of 14 tickets while the smallest possible wheel for the same win guarantee needs just 10 tickets. The algorithm this filter implements will never produce wheels that match highly optimized and tightly woven wheels you can find on internet. The main purpose of this filter is the coverage optimization of tickets resulting from your lottery strategy, not creation of optimized wheels from scratch.

If you are on a tight budget, you can create even smaller optimized wheels:

1. Repeat steps 1 to 4 above.
2. Select *I want to have **95% guarantee of matching at least 3 winning numbers when I hit any 6 numbers**. Algorithm preference: smaller resulting wheel*
3. Click button *OK* to start the filter. The filter window will close and you can track the filter progress at the lower right corner of the main window.
4. The filtering may take several minutes to finish, depending on how fast your computer is and how many execution cores your CPU has.
5. When the filter is finished, you will see the filtered tickets in the Package. There will be approximately 8 tickets left.
6. Use menu *Package - Coverage* to calculate the win guarantee of the optimized wheel.
7. Select *Show my winnings when I hit 6 numbers* and click button *Show*.
8. You will see that there is about 4% chance of winning nothing. That means the wheel guarantees win with a chance of 96%.

In the steps above we lowered the required win guarantee from 100% to 95% and the resulting wheel consists of 8 tickets only. That is reduction by 42%. So while still having very high chance (95%) of winning at least one match 3 prize we managed to lower the wheel size significantly and thus saved a lot of money.

▶ Keep in mind that lowering the required win guarantee by a few percent or just a fraction of percent can decrease the size of optimized wheel by tens or hundreds of tickets.

Optimize Coverage

If you have just finished applying all the filters according to your lottery strategy and the resulting set of tickets is too large for your betting budget, then there are two options. Either continue filtering with the risk of making an error in your estimates and filtering out the winning tickets. Or use *Package Optimizer* or Best Tickets filters to reduce the count of tickets and aim for lower tier prizes.

Example

Let's use the following simple (and not very effective) lottery strategy in Expert Lotto 6/49 Demo lottery:

1. Start with the full wheel of all possible combinations: menu *Package - Insert - Full Wheel*, select *Create all combinations of 6 numbers from a pool of 49*.
2. Use Odd/Even filter to keep only tickets with the most frequent ratio of 3:3. There will be 4,655,200 tickets left.
3. Use Low/High filter to keep only tickets with the most frequent ratio of 3:3. There will be 1,532,168 tickets left.
4. Use Sum Range filter to keep only tickets with the most frequent sum values 153 to 173. There will be 543,748 tickets left.

From statistical point of view these tickets have very high chance of winning. However so many tickets are way over any betting budget. So we will use *Package Optimizer* filter to go after lower tier prizes. The Package contains over half a million tickets that the filter must iterate over many times so we need to increase the filtering speed by optimizing the coverage for selected numbers only.

1. Use menu *Tools - Options - Number Coloring* to display number coloring settings.

2. Switch to *Hot/Cold* tab and select *Scan for hot/cold numbers in 30 latest draws, Maximum frequency of cold numbers: 2, Minimum frequency of hot numbers: 5*

3. Toggle button ▪▪ in the main toolbar and select *Hot/Cold* in the combo box listing all available number colorings.

4. Use menu *Package - Reduce - Optimize Coverage* and adjust filter settings as on the screenshot below

5. Click button OK to start filtering.

When the filtering is finished (it will take a while), there will be about 29 tickets left. Those tickets meet all the conditions of our lottery strategy above (odd/even, low/high, sum range) and have 95% chance of winning at least one *Match 3* prize if the next winning numbers consist entirely from hot or cold numbers.

To verify the win guarantee, open *Package Optimizer* filter window again. Select the same set of numbers on the ticket panel (see the picture above) and click button *Show Coverage*. Then choose *Show my winnings when I hit 6 numbers* and click button *Show*.

Package Optimizer filter is capable of reducing the ticket count by several orders of magnitude while maintaining the required win guarantee.

Filter Settings

Use the edit fields to define the required win guarantee. For example win guarantee *4 if 5* is expressed as *I want to have 100% guarantee of matching at least 4 numbers when I hit any 5 numbers*. It means you are guaranteed to win at least one *Match 4* prize if the winning numbers include at least 5 numbers of your wheel.

It is possible to significantly reduce the count of filtered tickets (and increase filtering speed) by reducing the probability of winning the required price. For example reducing the chance from 100% to e.g. 98% or 95% still gives very high chance of winning but it will also reduce the size of resulting wheel.

Option *Algorithm preference* affects filter performance. When *smaller resulting wheel* is selected, the filter will take more time to finish however the resulting optimized wheel will be smaller and more compact. With option *shorter filtering time* the filter will perform faster but the resulting wheel will need more tickets to meet the required win guarantee.

The ticket panel on the right of the filter window shows all the numbers in the Package. If a number is not present than its box has gray background and cannot be ticket using mouse.

It is possible to optimize coverage for a smaller set of numbers only. Simply use your mouse to tick/untick numbers on the ticket panel. For example you can tick only numbers that the most/least frequent in several past draws, numbers that did (not) hit for a long time etc. Number coloring highlights numbers selected in statistical tables.

Show Current Coverage button calculates and shows the win coverage of tickets in the Package. Menu *Package - Coverage* also shows the win coverage of the tickets in the Package. However the coverage is calculated for the whole number pool, i.e. all 49 numbers in a x/49 lottery. The coverage calculator started from *Package Optimizer* window shows the coverage only for numbers selected on the ticket panel in the filter window. So you can see the win guarantee when you expect that the winning numbers will be drawn from a smaller set of numbers.

▶ The filtering time increases exponentially with the size of the number pool - optimizing the coverage of only 15 numbers will be fast, however optimizing the coverage of the whole 49 number pool will take hours. If possible, untick some numbers on the ticket panel in the filter window.

▶ The filter runs much faster on modern multi-core CPUs. Check the number of execution cores your CPU has, then click menu *Tools - Options - Miscellaneous - Execution* and enter the number of cores into *Number of threads for long running tasks* field.

▶ You can watch the filter progress at the lower right corner of the main window. Click the progress bar to see additional info about the current size of the wheel and the current coverage percentage. You can stop the filter if the coverage is high enough (e.g. 90% or 95%).

▶ Always check the current coverage before applying this filter. If the win guarantee of the tickets in the Package is e.g. 92% before using this filter then it doesn't make sense to require 100% win guarantee.

See also Best Tickets filter.

Best Tickets

This filter finds the *best* or *worst* tickets in the Package. The filter opens from menu *Package - Reduce - Best Tickets*.

- *Best ticket* matches most of other tickets in the Package. The more numbers it matches in other Package tickets the better the ticket is. So filtering for the *best tickets* selects tickets with numbers that appear in most of other tickets in the Package. It maximizes lower division prize winnings while reducing the cost of the bet.
- *Worst ticket* has very little matches with other tickets in the Package. The less numbers it matches in other Package tickets the worse the ticket is. Filtering for the worst tickets selects tickets with numbers that are not very frequent in other Package tickets.

▶ Use this filter as the last step of your lottery strategy when the amount of tickets left in the Package is still too large for your betting budget. See also Package Optimizer filter.

Random Selection

This ticket filter accepts or reject randomly selected tickets in the Package. The filter opens from menu *Package - Reduce - Random Selection*.

You can use this filter as the last step of your lottery strategy when the amount of tickets left in the Package is too large for your betting budget. You can consider this filter as optimized 'quick pick' as it will select a few tickets at random. But the tickets in the Package already passed all your lottery strategy filters so you should have much larger chance of winning than choosing a totally random quick pick at lottery agent's shop. An alternate filter is Systematic Selection or Best Tickets filter.

Systematic Selection

This ticket filter accepts or reject every *N-th* ticket in the Package. The filter opens from menu *Package - Reduce - Systematic Selection*.

Example

Let's assume the Package contains the following tickets:

01-02-03-04-05-06
01-02-03-04-05-07
01-02-03-04-05-08
01-02-03-04-05-09
01-02-03-04-05-10
01-02-03-04-05-11
01-02-03-04-05-12
01-02-03-04-05-13
01-02-03-04-05-14
01-02-03-04-05-15

Then after filtering with settings *Accept every 4th ticket* the Package will contains only the following tickets:
01-02-03-04-05-09
01-02-03-04-05-13

Analyzer Table Filter

Most statistical tables in [Analyzer](#) window offer a convenient way of filtering Package tickets according to statistical properties selected in the table. Just highlight one or more table rows using your mouse and then click 🔻 button in *Analyzer* window toolbar. The same filter opens from corresponding *Analyzer* chart after clicking 🔻 button in chart's toolbar.

Note: This button is enabled only when the Package isn't empty.

Example

1. Analyze 10 latest draws in Expert Lotto 6/49 Demo Lottery.
2. Display statistics of [Ticket Numbers](#).
3. Sort the table by *Occurrence* in descending order.
4. Highlight the first four rows using your mouse. They correspond to numbers *6, 11, 23, 29* which have been drawn three times in 10 latest draws.
5. Insert all possible combinations into the Package.
6. Click 🔻 button in *Analyzer* window.
7. Select *At least 1 to 2 in each ticket* in *Statistical Properties Filter* window and click *OK* button.
8. After filtering there will be 5,781,006 tickets left in the Package. Each of these tickets contains at least one and at most two most frequent numbers from the last 10 draws.

See also [Repeating Numbers](#) ticket filter.

Example

1. Analyze all draws in Expert Lotto 6/49 Demo Lottery.
2. Display statistics of [Triplets](#).
3. Sort the table by *Occurrence* in ascending order.
4. Highlight all rows with zero occurrence - those are the triplets that haven't been drawn in the lottery history yet.
5. Insert all possible combinations into the Package.
6. Click 🔻 button in *Analyzer* window.

7. Select *At least 1 to 3 in each ticket* in *Statistical Properties Filter* window and click *OK* button.

8. After filtering there will be 992,911 tickets left in the Package. Each of these tickets contains at least one and at most three number triplets that haven't been drawn yet.

See also Statistical Filter.

Example

1. Analyze 10 latest draws in Expert Lotto 6/49 Demo Lottery.

2. Display statistics of Ticket Position, switch to *Position 1* and display bar chart.

3. Click button ▊ᵢ in chart's toolbar to display chart's movable ranges.

4. Use the sliders on the right-hand side of the chart window to highlight bars corresponding to value of 2. It will be two bars for numbers 2 and 8 respectively.

5. Insert all possible combinations into the Package.

6. Click 🌪 button in the chart window.

7. After filtering there will be 2,283,337 tickets left in the Package. Each of these tickets contains number 2 or number 8 at the first ticket position.

See also Numbers at Positions ticket filter.

Winning Numbers Chart Filter

Most charts in Winning Numbers Charts window offer a convenient way of filtering Package tickets according to the range of statistical properties highlighted in the chart window. First click button ▊ᵢ in chart's toolbar to display movable chart ranges and then use sliders to the right of the chart window to highlight a vertical section of the chart where you think the value from the next draw will fall in. Then click 🌪 button in chart's toolbar to open filter window and filter ticket in the Package.

Note: This button is enabled only when the Package isn't empty and chart's movable ranges are showing.

Example

1. Click menu *Winning Numbers - Show As - Charts*.

2. In *Winning Numbers Charts* window select *10 latest draws*.

3. Select *Position 1* in *Show* combo box to display the chart of numbers drawn at the first ticket position.

4. The latest chart value is 23 so we can speculate the next draw will produce much lower number at the first ticket position.

5. Click button ▊ᵢ in chart's toolbar to display chart's movable ranges.

6. Use the sliders on the right-hand side of the chart window to highlight chart area corresponding for example to numbers from 3 to 8.

7. Insert all possible combinations into the Package.

8. Click 🝫 button in *Winning Numbers Chart* window.

9. After filtering there will be 6,241,185 tickets left in the Package. Each of these tickets has the first number in the range of 3 to 8.

See also <u>Numbers at Positions</u> ticket filter.

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Save Package to a File

Menu command *Package - Save to File* opens standard file browser window where you can choose the folder and file name the Package tickets will be saved to. You can choose the format of saved file in Files of type combo box:

- **Text Files** - this is a plain text format where each ticket is on a separate line, ticket numbers are usually separated with comma (,) character (see <u>Export options</u>). You can edit such files in any text processor or import it to a spreadsheet processor application.
- **Ticket Files** - this is a proprietary binary format suitable for large number of tickets in the Package as it requires much less disk space than the text file format. Such files have extension *.tXYY* where *X* is the count of numbers in a ticket and *YY* is the count of numbers in the pool.

Then window *Save Package to File* opens showing the full path to the selected file. You can pick a different file by clicking *Browse* button.

Button *Save* saves the current Package contents to the selected file. You can use options *Tagged* and *Un-tagged* to save only <u>tagged</u> tickets or only un-tagged tickets or both (default settings).

▶ You can also export the Package Table directly to spreadsheet processor application with menu command *File - Export*.

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Printing to Playslips

Menu command *Package - Print to Playslip* opens a new *Print to Playslips* window where you can print the Package tickets directly to paper playslips. When printing for the very first time you might be prompted to select the default playslip layout for the current lottery in <u>Playslips </u> manager window. The playslip layout is

a template which defines the dimensions and positions of number grids. If you want to print tickets to a different playslip type click button *Customize* next to the playslip layout field to open *Playslips* window where you can choose a different playslip layout for the current lottery and/or customize layout's settings.

- **Print range** - You can print either all tickets in the Package or print only a selected range of tickets. The second option is useful when re-printing playslips that failed to load correctly into the printer, see also *Print page numbers* option below.
- **Playslip orientation** - It is recommended to load the paper playslips into the printer with their shorter side up. This playslip orientation is less prone to misalignments.
- **Print margins** - Use these fields to correct the print margins if the numbers are printed outside their boxes on playslips, see below.
- **Tickets per playslip** - Use this option to adjust how many tickets are to be printed on each playslip.
- **Playslip options** - These options differ for each playslip layout. They usually define the amount of money to bet, how many times the bet should repeat etc.

When option *Print page numbers* is selected then each printed playslip will include the indexes of printed tickets. For example 13-18 means that the six tickets printed to this playslips are at positions 13 to 18 in the Package. If a playslip fails to print correctly, e.g. because the printer didn't load the playslip straight, you can use the ticket indexes to print them again.

Click button *Print test playslip* to make a test print-out which fills all number boxes.

Print Margins

When printing to playslips for the very first time, the printed markers probably will not align into grid boxes. It is because each printer make and type has different unprintable margins at the top and on the left of paper sheet. You must compensate these inaccuracies by adjusting print margins in *Print to Playslips* window:

The picture below is paper playslip for Czech lottery *Sportka*.

Load several playslips into your printer. Make sure the playslip orientation matches the layout of ticket panel as displayed in the application. In this case the lowest number in the first grid must be in the upper left corner.

Click *Print test playslip* button. The test printout will be similar to the picture below.
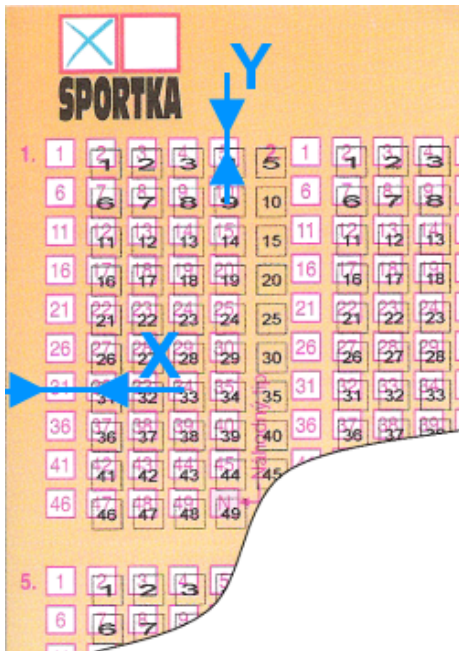
As you can see, the markers need shifting to the left and also a bit to the top. Measure distance **X** as indicated in the picture above and enter it as a negative number into *Print margins left* field. **Note:** To shift markers to the right, measure the distance and enter it as positive number.

Then measure distance **Y** as indicated in the picture above and enter it as a negative number into *Print margins top* field. **Note:** To shift the markers down, measure the distance and enter it as positive number.

Then make a new test print out and now the printed markers should align with playslip's grid boxes.

Note: The correct print margins are stored in your lottery settings and reused on next application startup.

Check Package Winnings

Use menu command *Package - Check Winnings* to see the winnings of tickets in the Package. For example you can load into the Package the tickets you bet last week, add the latest draw to your winning numbers database and then use this window to check if you won anything.

Enter the drawn numbers into edit fields and click *Check* button. The count of winning prizes is shown in the table below. You can also click down-arrow button to open a popup list of all draws from your winning numbers database. Click any draw in the list to populate the edit fields with its winning numbers. The date of the selected draw is displayed below the edit fields. Click button *Check* to recalculate the winnings.

Note: Don't forget to bring your winning numbers database up-to-date before checking the winnings of your latest bet.

Column *Payout* shows the money payouts for given prize category. Double-click any field in that column to adjust the payouts. Column *Total* shows the break down of winnings per prize category.

Fields below the table show the total winnings, the total cost of the bet and net profit. The cost of single bet is adjustable using menu *Tools - Options - Miscellaneous - Payouts*.

▶ Edit fields are pre-initialized with the current What-If numbers. If this feature is turned off, the edit fields contain the winning numbers from the latest draw.
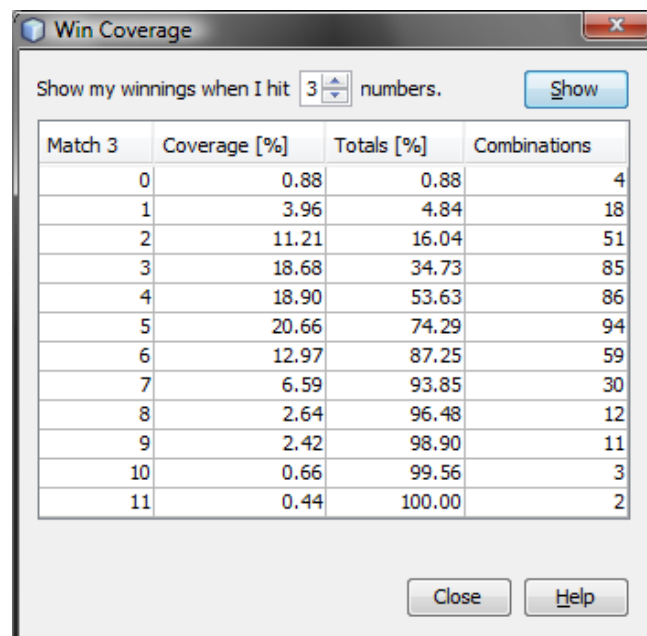
Win Coverage

Win Coverage window opens from menu *Package - Coverage* and shows the minimum win guarantee for Package tickets.

First select how many numbers you expect to hit then click *Show* button. The coverage is calculated and the table below shows the win guarantee achieved when you hit the selected count of numbers.

Example

Match 3	Coverage [%]	Totals [%]	Combinations
0	0.88	0.88	4
1	3.96	4.84	18
2	11.21	16.04	51
3	18.68	34.73	85
4	18.90	53.63	86
5	20.66	74.29	94
6	12.97	87.25	59
7	6.59	93.85	30
8	2.64	96.48	12
9	2.42	98.90	11
10	0.66	99.56	3
11	0.44	100.00	2

The screenshot above shows the win coverage for 100 random combinations of 15 numbers in a 6/49 lottery. If you hit any 3 numbers from the 15 numbers in the pool then the worst-case scenario is winning nothing as shown on the first table row. Four triplets out of 455 possible combinations of three numbers are missing in Package tickets so the chances of winning nothing are 0.88%.
The second table row gives 3.96% chance of winning at least one *Match 3* prize.

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You can win six *Match 3* prizes with the probability of 12.97%. But there's also 87.25% chance of wining six *Match 3* prizes **OR** five *Match 3* prizes **OR** four *Match 3* prizes **OR** three *Match 3* prizes **OR** two *Match 3* prizes **OR** one *Match 3* prize **OR** winning nothing.
The best case scenario is winning eleven *Match 3* prizes with the chance of 0.44%.

Another example shows the win coverage for the same 100 random combinations of 15 numbers when six numbers are hit:

Win Coverage

Show my winnings when I hit 6 numbers. [Show]

Match 6	Match 5	Match 4	Match 3	Coverage [%]	Totals [%]	Combinations
0	0	3	47	0.02	0.02	1
0	0	4	37 - 46	0.16	0.18	8
0	0	5	37 - 47	0.26	0.44	13
0	0	6	32 - 46	0.86	1.30	43
0	0	7	29 - 44	1.68	2.98	84
0	0	8	27 - 46	2.52	5.49	126
0	0	9	27 - 49	3.64	9.13	182
0	0	10	25 - 45	4.08	13.21	204
0	0	11	24 - 51	4.54	17.74	227
0	0	12	22 - 45	4.58	22.32	229
0	0	13	22 - 44	3.30	25.61	165
0	0	14	22 - 44	2.12	27.73	106
0	0	15	22 - 40	1.74	29.47	87
0	0	16	21 - 43	1.22	30.69	61
0	0	17	22 - 39	0.68	31.37	34
0	0	18	25 - 39	0.22	31.59	11
0	0	19	23 - 35	0.20	31.79	10
0	0	20	31 - 34	0.04	31.83	2
0	0	21	26 - 32	0.04	31.87	2
0	0	22	29	0.02	31.89	1
0	1	3 - 20	17 - 47	37.44	69.33	1874
0	2	2 - 21	20 - 47	20.18	89.51	1010
0	3	3 - 22	20 - 45	6.53	96.04	327
0	4	4 - 20	22 - 40	1.50	97.54	75
0	5	6 - 16	23 - 40	0.42	97.96	21
0	6	8 - 13	32 - 35	0.04	98.00	2
1	0 - 4	3 - 18	21 - 45	2.00	100.00	100

There are 15 unique numbers in the Package.

[Close] [Help]

You can win at least three *Match 4* prizes **AND** 47 *Match 3* with the chance of 0.02% when hitting any six numbers.
There's a 0.16% chance of winning four *Match 4* prizes **AND** 37 to 46 *Match 3* prizes.
The third table row shows you can win five *Match 4* prizes **AND** 37 to 47 *Match 3* prizes **OR** four *Match 4* prizes **AND** 37 to 46 *Match 3* prizes **OR** three *Match 4*

prizes **AND** 47 *Match 3* prizes with the chance of 0.44%.

The best case scenario is winning one Jackpot prize **AND** up to 4 *Match 5* prizes **AND** 3 to 18 *Match 4* prizes **AND** 21 to 45 *Match 3* prizes. As you can see on the last table row the chances are 2%.

▶ Right-click the results table to open popup menu to export or print the table.

See also [Package Optimizer](#) filter.

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System Bet

Some lotteries allow to play more than the regular count of numbers in a single bet. For example some lottery operators allow to play 9 or 10 numbers in a 6/xx lottery. It is usually called *system bet.*

There are 210 possible ways to pick six numbers from a pool of ten numbers. So if you play a single ten number line in a system bet you are actually 210 combinations of six numbers in a regular 6/xx lottery. Playing five such system bet lines covers 1050 combinations of six numbers - althoug some numbers will overlap so the actual coverage will be slightly lower.

You can use menu *Package - System Bet* to create such a system bet from tickets in the Package. First you must choose how many numbers are to be added to each ticket in the Package. The more numbers you choose the smaller the resulting system bet. Naturally system bets are more expensive when adding more numbers.

Next you must choose how many tickets you want to cover in your system bet. Selecting 100% ensures that the resulting system bet wheel includes all tickets in the Package. Lowering the percentage to e.g. 95% means that about 5% of Package tickets will be missing in the system bet. However such option may greatly reduce the system bet size thus lowering the cost of the bet.

Option *Algorithm preference* allows to get smaller (and cheaper) system bet when set to *smaller resulting wheel* or you can create the system bet faster by selecting *shorter processing time*. However in this case the resulting wheel will be slightly larger.

After pressing OK button the application will open a new window where you can track the progress of system bet creation. Current coverage shows how many Package tickets are covered in the system bet so far. Combinations count shows how many lines the system bet has. You can abort the process any time when you see the coverage is high enough.

Note: This feature is available for Jackpot-like lotteries only. It does not work for Pick-N and Powerball lotteries.

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Swap Numbers

Menu command *Package - Swap Numbers* opens a new window you can use to replace selected numbers with other numbers in all Package tickets.

The window lists all numbers found in Package tickets in a table. The first column shows the original number, the second column is the number to be replaced with. To change the replacement number click into the appropriate cell in the second column and pick a new number from the popup list. You can also choose to mask ticket position containing the original number by choosing the last item from the popup list labeled *<mask>*.

Example
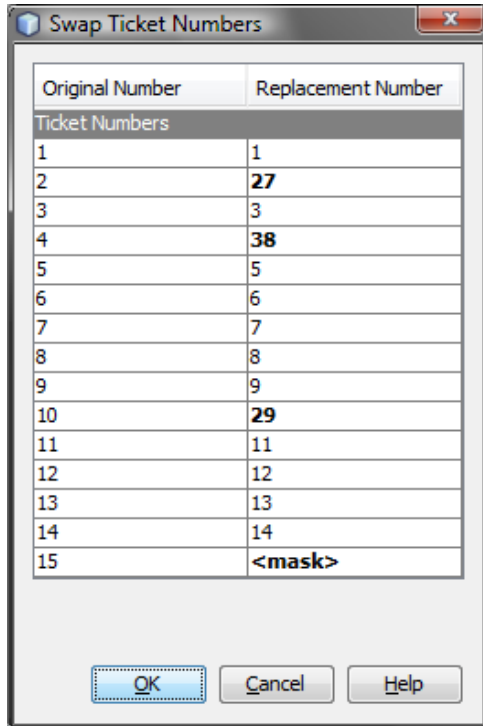
The settings above replace number 2 with number 27, number 4 with number 38 and number 10 with number 29. Tickets positions with number 15 will be masked.

When such number swap is applied to e.g. full wheel of 15 numbers ranging 1 to 15 then the Package tickets will change from this:

1	2	3	4	5	6
1	2	3	4	5	7
1	2	3	4	5	8
1	2	3	4	5	9
1	2	3	4	5	10
1	2	3	4	5	11
1	2	3	4	5	12
1	2	3	4	5	13
1	2	3	4	5	14
1	2	3	4	5	15
1	2	3	4	6	7
1	2	3	4	6	8
1	2	3	4	6	9
1	2	3	4	6	10
1	2	3	4	6	11
1	2	3	4	6	12
1	2	3	4	6	13
1	2	3	4	6	14
1	2	3	4	6	15
1	2	3	4	7	8
1	2	3	4	7	9
1	2	3	4	7	10
1	2	3	4	7	11

to this:

1	11	15	17	19	36
4	15	16	17	47	
3	5	10	12	15	47
9	12	13	35	36	
3	8	11	12	13	19
3	4	5	12	15	36
4	8	13	17	19	47
4	13	14	15	47	
5	8	10	15	36	47
4	12	15	35	36	47
3	4	5	16	19	
1	3	8	11	14	15
1	5	12	13	35	47
1	3	15	16	35	47
3	4	7	12	13	19
1	4	8	10	35	36
1	5	10	13	35	
5	7	11	17	19	35
3	4	5	12	13	36
9	10	14	16	36	
1	5	7	8	15	17
1	3	9	10	13	19
3	11	12	13	19	35

Note that after the swap the numbers within each ticket are resorted.

This feature is useful when using optimized wheels with predefined win guarantee. Such wheels are usually built using numbers ranging 1 to N. So with *Swap Numbers* function you can replace the wheel numbers with the numbers you think have the best chance of hitting in the next draw.

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Mask Ticket Numbers

This window opens from menu *Package - Mask Numbers*. You can use it to replace selected pool numbers with masked numbers in all tickets in the Package.

First on the ticket panel tick the numbers you want to mask then press *Ok* button. Each ticket in the Package will have the selected numbers masked. Masked positions are displayed as grey rectangles in ticket tables.

See also Masked Positions.

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Masked Positions

Masked positions allow hiding one or more ticket positions so in e.g. 6/49 lottery you can work with tickets with five or less numbers instead of 6 numbers. Masked positions are displayed as grey rectangles in ticket tables:

		4	7	19	24	28
	5		20	32	37	40
	5		10	18	23	49
		12	15	29	38	49
	10	24	25	27	44	45
	27	28	31	43	44	47
		3	15	28	32	40
		5	16	19	39	42
	2	12	19	38	44	49
	18	19	23	27	32	45
			13	24	31	32
	7	21	22	29	39	48

To manage tickets with masked positions in the Package click menu *Package - Masked Positions*. This opens a new window where you can select the desired ticket positions and then click buttons to:

- **Mask ticket positions** - all tickets will have the selected positions masked.
- **Remove masked tickets** - tickets that have the selected positions masked will be removed from the Package.
- **Retain masked tickets** - the Package will retain only those tickets that have the selected positions masked.

You can mask ticket positions in several ways:

- Using menu *Package - Masked Positions* as described above.
- Using menu *Package - Mask Numbers* to mask selected pool numbers.
- Using menu *Package - Swap Numbers* to mask ticket positions that contain selected pool numbers.
- When inserting ticket numbers from keyboard - enter star sign (*) instead of a ticket number to mask a ticket position.
- When generating random combinations or full wheel - just choose lower combination size in appropriate window. For example in a 6/49 lottery you can generate a full wheel of 4 numbers from a pool of 49. In this case the first four ticket position will contain pool numbers, the remaining two ticket positions will be masked.

Replace Ticket

Replace Ticket window opens from menu *Edit - Replace*. You can use it to change the numbers of a selected ticket in the Package. The numbers being replaces are shown in read-only boxes at the top of this window. Enter new ticket numbers into edit fields or click appropriate boxes in the Ticket Panel to select new ticket numbers.

Button *Replace* changes the ticket numbers in currently selected ticket only. Button *Replace All* scans the whole Package and replaces the numbers of all tickets with the same numbers as the selected ticket. When finished the status bar at the bottom of the main application window shows the count of replaced tickets.

Note: The menu command is enabled only when a Package window is activated (Table, Matrix, Winnings, Properties) and just one ticket is selected in Package table.

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Package Table

Package Table window opens from menu *Package - Show As - Table* and displays Package content as a plain table. Table rows are Package tickets, table columns are ticket numbers. The first table column serves for ticket tagging. To tag a ticket click its first column. Click the first column again to untag it.

When one or more tickets are selected in the table the following changes happen in application's user interface:

- Number Coloring is activated to highlight occurrences of numbers in selected tickets. This change is propagated to other application windows, including Package Table window.
- Ticket Panel window shows numbers of a single selected ticket.
- Ticket Properties window calculates statistical properties of a single selected ticket.
- What-If toolbar displays numbers of a single selected ticket. This change is propagated to other application windows that show *What-If* numbers.

Click menu *File - Export* or menu *File - Print* to export the Package table contents to a file or to print the Package table respectively.

Status bar at the bottom of this window shows the count of tickets in the Package and the index of currently selected ticket.

▶ Use menu *Edit - Find* to search for a ticket with given numbers. Use menu *Edit - Replace* to change ticket numbers in currently selected ticket. Use menu *Edit - Delete* to remove currently selected ticket(s) from the Package. Menu commands *Edit - Undo* and *Edit - Redo* revert the results of the last Package operation.

▶ The Package content is restored after application restart and also when switching to/from a different lottery.

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Package Matrix

Package Matrix window opens from menu *Package - Show As - Matrix* and displays Package content as a matrix of all pool numbers. Matrix rows are Package tickets, matrix columns are pool numbers. There are several layouts of pool numbers available. You can switch to a different layout using *Matrix Layout* combo box at the bottom of *Package Matrix* window.

The first matrix column serves for ticket [tagging](#). To tag a ticket click its first column. Click the first column again to untag it.

An important feature of *Package Matrix* window is the highlighting of pool numbers to improve visual perception of ticket numbers.
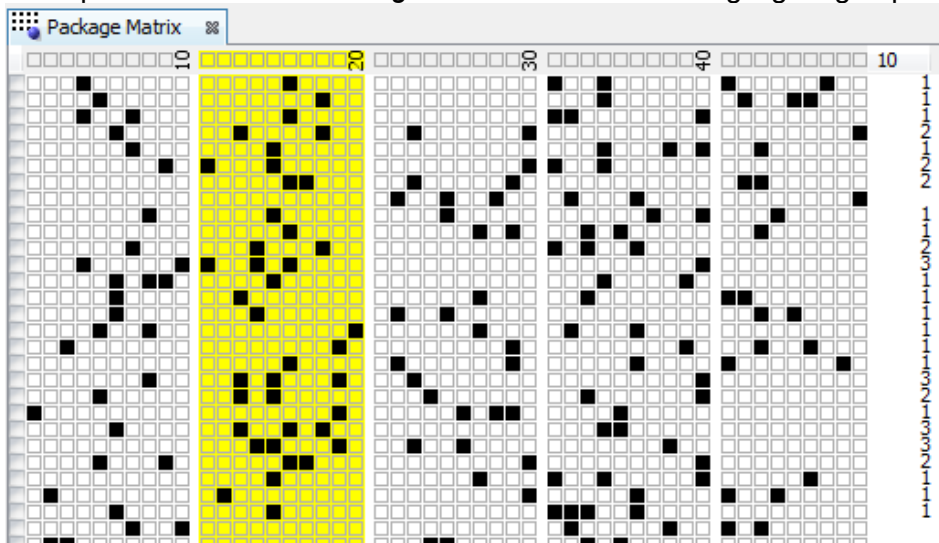
The picture above shows the highlight of numbers 11 to 20 - their matrix cells have yellow background. Note that the last column in matrix header displays the count of highlighted numbers. Also the last column on each matrix row shows how many highlighted numbers each ticket contains.

There are several ways to highlight numbers in the matrix:

- Click individual cells in matrix header to switch the highlight of the number the cell represents on/off. Note that tooltip shows pool number corresponding to the header cell under mouse cursor.
- Click numbers in [Ticket Panel](#) window to toggle their highlight on/off.
- Click and drag mouse cursor to highlight several numbers at the same time.
- Click and drag mouse cursor while holding down *CTRL* key to remove highlight from the cells under cursor.
- Double-click the last column in matrix header to remove all highlights.
- Select one or more tickets in the matrix and click *Highlight Selection* button at the bottom of *Package Matrix* window. This highlights all numbers from selected tickets.

After highlighting one or more pool numbers you can filter tickets in the Package by clicking *Filter* button at the bottom of this window. This removes all tickets from the Package that contain the selected count of highlighted numbers. Button *Match Summary* opens a window showing summary count of tickets with highlighted numbers.

When one or more tickets are selected in the matrix the following changes happen in application's user interface:

- Number Coloring is activated to highlight occurrences of numbers in selected tickets. This change is propagated to other application windows, including Package Matrix window.
- Ticket Panel window shows the numbers of a single selected ticket.
- Ticket Properties window calculates statistical properties of a single selected ticket.
- What-If toolbar displays numbers of a single selected ticket. This change is propagated to other application windows that show *What-If* numbers.
- *Highlight Selection* button at the bottom of *Package Matrix* window is enabled.

Status bar at the bottom of this window shows the count of tickets in the Package and the index of currently selected ticket.

▶ If the matrix table is too wide for your screen or too small for your eyes you can resize it using the slider at the bottom of the window.

▶ Use menu *Edit - Find* to search for a ticket with given numbers. Use menu *Edit - Replace* to change ticket numbers in currently selected ticket. Use menu *Edit - Delete* to remove currently selected ticket(s) from the Package. Menu commands *Edit - Undo* and *Edit - Redo* revert the results of the last Package operation.

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Package Properties

Menu command *Package - Show As - Properties* opens *Package Properties* window showing a table of statistical properties of tickets in the Package. Each table row represents one ticket in the Package, each table column corresponds to a statistical property. You can customize the columns using menu *Tools - Options - Statistics*.

The top-left corner of this window shows *Columns* button which opens Select Columns window where you can choose which statistical properties should show in this window. It can be useful when there are too many table columns.

▶ Drag column headers to reorder table columns, drag column header borders to resize table columns.

▶ Click menu *File - Export* to export the table to CSV or MS Excel file.

Status bar at the bottom of this window shows the index of currently selected ticket and the total count of tickets in the Package.

▶ Use menu *Edit - Find* to search for a ticket with given numbers. Use menu *Edit - Replace* to change ticket numbers in currently selected ticket. Use menu *Edit - Delete* to remove currently selected ticket(s) from the Package.

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Package Winnings

Package Winnings window opens from menu *Package - Show As - Winnings* and displays Package tickets and the prizes they might have won in the lottery history. The first table column serves for ticket [tagging](). To tag a ticket click its first column. Click the first column again to untag it. The next columns contain ticket numbers and the last set of columns shows the count prizes each ticket would have won when compared with the selected range of past winning numbers draws.

						Jackpot	2nd Prize	3rd Prize	4th Prize	5th Prize
3	14	23	27	42	47					1
2	10	15	16	24	25					1
6	11	12	15	29	42					
6	22	28	29	39	45					1
5	17	19	21	38	43					
10	12	19	29	31	37					
5	10	12	21	43	44					
17	21	28	30	33	41					
9	14	19	37	40	46					
8	15	19	29	34	39					
25	32	33	38	40	47					
8	12	26	34	38	46					
5	6	16	31	40	44				1	
8	16	20	21	35	49					
3	14	30	41	46	49					

The image above shows *Package Winnings* of several random combinations in Expert Lotto 6/49 demo lottery. You can see that for example ticket *3-14-23-27-42-47* would have won one 5th prize during the latest 10 draws. Ticket *5-6-16-31-40-44* would have won one 4th prize.

▶ Hover mouse cursor above any table cell to see the latest matching draw.

Click *Select* button at the top of this window to choose which past winning numbers draws should be compared with Package tickets to calculate the winnings.

Option *Show tickets winning at least* hides tickets that haven't won anything or won only lower prizes than the one selected in the combo box next to this option. If there are more than 100 tickets winning at least the selected prize, button *Next* becomes enabled and you can click it to display next 100 such Package tickets. Click button *Previous* to display previous batch of tickets winning the desired prize. To see the winnings for all Package tickets untick option *Show tickets winning at least*.

Button *Summary* displays a new [window]() showing the summary count of winning tickets for each prize.

When one or more tickets are selected in the table the following changes happen in application's user interface:

- **Number Coloring** is activated to highlight occurrences of numbers in selected tickets. This change is propagated to other application windows, including this window.
- **Ticket Panel** window shows numbers of a single selected ticket.
- **Ticket Properties** window calculates statistical properties of a single selected ticket.
- **What-If** toolbar displays numbers of a single selected ticket. This change is propagated to other application windows that show *What-If* numbers.

Click menu *File - Export* or menu *File - Print* to export the table contents to a file or to print the table respectively.

Status bar at the bottom of this window shows the count of tickets in the Package and the index of currently selected ticket.

▶ You can resize prize columns by dragging column edge with your mouse.

▶ Use menu *Edit - Find* to search for a ticket with given numbers. Use menu *Edit - Replace* to change ticket numbers in currently selected ticket. Use menu *Edit - Delete* to remove currently selected ticket(s) from the Package. Menu commands *Edit - Undo* and *Edit - Redo* revert the results of the last Package operation.

Filtering Tickets

There is one sure way to win the lottery Jackpot - play all possible combinations. However the payouts are never so big to return the cost of such a huge bet, not to mention the time needed to fill out so many playslips. Most lottery players have limited betting budget so they play a small wheel only. Depending on your lottery strategy you can download a wheel from internet or create a new one from scratch by filtering down the whole set of all possible combinations. The filtering process excludes combinations - *tickets* - that are not expected to win in the next draw. It is either a manual process of going through the tickets one by one and removing those you don't like or it can be done in bulk by applying *ticket filters*.

Ticket filter is a simple *yes/no* condition. A filter *accepts* a ticket when the ticket numbers meet filter's condition, filter *rejects* a ticket if the ticket doesn't meet filter's condition. The filter condition can be either a simple check for desired ratio of odd and even numbers or the filter can compare ticket numbers with past draws or it can be a complex hierarchy of other simple filters.

Package Filtering

To filter tickets in the Package, click menu *Package - Reduce - Filter Tickets*. Then select the filter you wish to apply to Package tickets and click *Select* button to open the selected filter. A new window opens where you can enter the settings of selected filter. At the bottom of the filter window there are buttons to run the filter:

- **Matching Tickets** - with option *Accept* the filtered Package will contain tickets that meet filter settings. Option *Reject* reverses the filter condition so the filtered Package will contain only tickets that don't pass the filter settings.
- **OK** - applies the filter to the Package tickets and closes the filter window. You can track the filter progress at the bottom of the main application window. To abort the filter, click the *Abort* button next to the filter's progress bar.

- **Apply** - applies the filter to the Package tickets and keeps the filter window opened. When the filter is finished you can adjust filter settings and apply the filter again. To abort the filter, click the *Abort* button next to the filter's progress bar.
- **Preview** - counts how many Package tickets the filter accepts and how many tickets the filter rejects without any actual changes to the Package contents.
- **Cancel** - closes the filter window.

To revert the filtering results, click menu *Edit - Undo* to return the Package to the same state as before filtering.

▶ When *OK* or *Apply* button is clicked in the filter window then the current filter settings are remembered and reused as the default settings when the filter is opened again.

▶ If you play a lottery that draws one or more bonus numbers from the same pool as the main numbers it is possible to modify the selection of past draws in filter window to merge the bonus number(s) into the main numbers. This option is available only when filtering Package tickets using a single filter. It isn't possible to merge bonus numbers with main numbers in *Complex Filter* window.

Complex Filters

Implementing an advanced lottery strategy usually requires a lot of ticket filtering. Complex Filters allow grouping of frequently used simple filters together and applying them in a single step. *Complex Filters* can be stored to a file and reopened on next application startup. Another advantage of *Complex Filters* is that they support building of a deep hierarchy of simple filters with *AND/OR* logical operators. *Complex Filters* can be also back-tested and their performance is easily evaluated.

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Odd/Even

This filter accepts only tickets that have the selected ratio of *odd* and *even* main numbers.

Example

When filter settings are *3 odd numbers and 3 even numbers* then:
- 01-02-03-04-05-06 - filter accepts this ticket because it has three odd numbers: 1,3,5 and three even numbers: 2,4,6.
- 01-02-03-04-05-07 - filter rejects this ticket because it has four odd numbers and two even numbers.
- 01-02-03- *-05- * - filter accepts this tickets because it has 3 odd numbers, one even number and the rest of ticket positions are masked.

Note: Number zero is considered to be an even number.

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Low/High

This filter accepts only tickets that have the selected ratio of *low* and *high* main numbers. Number is low when it is in the lower half of number pool, number is high when it is in the upper half of number pool.

For example in a x/40 lottery, numbers 1 to 20 are low, numbers 21 to 40 are high numbers. In a x/49 lottery, numbers 1 to 24 are low, numbers 25 to 49 are high.

Example - Expert Lotto 6/49 Demo Lottery

When filter settings are 3 low numbers and 3 high numbers then:

- 01-02-03-25-26-27 - filter accepts this ticket because it has three low numbers: 1,2,3 and three high numbers: 25,26,27.
- 01-02-03-04-25-26 - filter rejects this ticket because it has four low numbers and two high numbers.
- 01-02-03- *-25- * - filter accepts this tickets because it has 3 low numbers, one high number and the rest of ticket positions are masked.

Sum Range

This filter accepts tickets that have the sum of their main numbers within specified range.

Note: When playing powerball-like lotteries, which draw one or more numbers from a separate pool, then the powerball number(s) is not included in ticket's sum value.

Example

When filtering with settings *Min Sum: 180, Max Sum: 200* then:

- 13-25-35-36-42-49 - filter accepts this ticket because the sum of its numbers is *13+25+35+36+42+49=200*.
- 01-10-20-30-40-49 - filter rejects this ticket because the sum of its numbers is *1+10+20+30+40+49=150* which is outside the specified range.
- 01- *-37-46-47-49 - filter accepts this ticket because the sum of its numbers is *1+37+46+47+49=180*.

See also Ticket Sum statistics.

Odd/Even Sum Range

This filter is similar to [Sum Range](#) filter. The filter accepts tickets that have the sum of their main numbers within specified range and the sum value is either odd or even.

Note: When playing powerball-like lotteries, which draw one or more numbers from a separate pool, then the powerball number(s) is not included in ticket's sum value.

Example

When filtering with settings *Even sums, Min sum: 180, Max sum: 200* then:

- 01-02-33-47-48-49 - filter accepts this ticket because the sum of its numbers is 180 which is even number.
- 01-02-34-47-48-49 - filter rejects this ticket because the sum of its numbers is 181 which is within allowed range but it is odd number.
- 44-45-46-47-48-49 - filter rejects this ticket because the sum of its numbers is 279 which is out of allowed range.

When filtering with settings *Even sums, Min sum: 181, Max sum: 181* then the filter rejects all tickets. Sum of even numbers can never be odd number.

See also [Ticket Sum](#) statistics and [Sum Range](#) filter.

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Sum Root

This filter accepts tickets with selected *sum root* values. Sum root is a single digit number ranging from 1 to 9. It is calculated from arithmetic sum of ticket's main numbers by repeatedly summing the digits of the sum value until only a single digit number is left.

Example

Ticket sum value for number combination 1-2-3-4-5-6 is 1+2+3+4+5+6=21 so ticket's sum root is *2+1=3*.

Ticket sum of ticket 6-20-23-29-38-42 is 158. Its sum root is then *1+5+8=14 -> 1+4=5*.

See also [Sum Root](#) statistics.

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Sum of Odd/Even Numbers

This filter is similar to Sum Range filter. It accepts tickets that have the sum of their odd or even numbers within specified range.

Note: When playing powerball-like lotteries which draw one or more numbers from a separate pool then the powerball number(s) is not included in ticket's sum value.

Example

When filtering with settings *Sum of odd numbers is 180 to 200* then:

- 01-02-39-45-47-49 - filter accepts this ticket because the sum of its odd numbers is *39+45+47+49=181*.
- 41-44-46-47-48-49 - filter rejects this ticket because the sum of its odd numbers is *41+47+49=137* which is outside the specified range.
- 02-04-06-08-10-12 - filter rejects this ticket because the it doesn't have any odd numbers.

When filtering with settings *Sum of even numbers is 181 to 181* then the filter rejects all tickets. Sum of even numbers can never be odd number.

See also Odd/Even Numbers Sum statistics and Sum Range filter.

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Sum of Low/High Numbers

This filter is similar to Sum Range filter. It accepts tickets that have the sum of their low or high numbers within specified range.

Note: When playing powerball-like lotteries which draw one or more numbers from a separate pool then the powerball number(s) is not included in ticket's sum value.

Example

When filtering with settings *Sum of high numbers is 180 to 200* then:

- 01-02-36-47-48-49 - filter accepts this ticket because the sum of its high numbers is *36+47+48+49=180*.
- 44-45-46-47-48-49 - filter rejects this ticket because the sum of its high numbers is *279* which is outside the specified range.
- 01-02-03-04-05-06 - filter rejects this ticket because the it doesn't have any high numbers.

See also Low/High Numbers Sum statistics and Sum Range filter.

Sum's Last Digit

This filter is similar to Sum Range filter. The filter accepts tickets that have the selected least significant digit in the sum of their main numbers.

Note: When playing powerball-like lotteries which draw one or more numbers from a separate pool then the powerball number(s) is not included in ticket's sum value.

Example

When filtering with settings *Sum's Last Digit: 0, 1* then:

- 01-02-03-04-05-06 - filter accepts this ticket because the sum of its numbers is 21 and the last digit of that number is 1.
- 42-43-44-46-47-48 - filter accepts this ticket because the sum of its numbers is 270 and the last digit of that number is 0.
- 01-02-03-04-05-07- filter rejects this ticket because the sum of its numbers is 22 so the last digit of that number is 2. Such last digit is not allowed in filter's condition.

See also Sum's Last Digit statistics and Sum Range filter.

Digits Sum

The filter accepts tickets that have the sum of their *first* and/or *last digits* in the selected range. Each pool number breaks down into two digits. The *first digit* is the leading digit of the number, the *last digit* is the second digit of the number. For example the first digit of number 23 is 2, the last digit of that number is 3. The first digit of number 9 is 0, the last digit of that number is 9.

Example

When filter settings are *Sum of first and last digits is min: 25 max: 25* then

- 01-02-03-04-05-19 - filter accepts this ticket because the sum of its first digits is 1 and the sum of its last digits is 24. So the total sum of all digits is 25.
- 01-02-03-04-05-29 - filter rejects this ticket because the sum of all its digits is 26 which is outside the allowed range.

When filter settings are *Sum of first digits is min: 0 max: 0* then

- 01-02-03-04-05-09 - filter accepts this ticket because all its numbers are lower than 10 so the sum of first digits is 0.

See also statistics.

Sum's Last Digit

This filter is similar to Sum Root filter - it accepts tickets with selected *sum root* values calculated from first and/or last digits. Sum root is a single digit number ranging from 1 to 9. It is calculated from arithmetic sum of ticket's first or last digits of main numbers by repeatedly summing the digits of the sum value until only a single digit number is left.

Note: When playing powerball-like lotteries which draw one or more numbers from a separate pool then the powerball number(s) is not included in ticket's sum value.

Example

When filtering with settings *Sum root of last digit is: 3, 5* then:

- 01-02-03-04-05-06 - filter accepts this ticket because the sum of its last digits is 21 and the root of that sum is 3.
- 10-23-24-32-35-49 - filter accepts this ticket because the sum of its last digits is 0+3+4+2+5+9=23 and the root of that sum is 5.
- 01-02-03-04-05-07- filter rejects this ticket because the sum of its last digits is 22 with the root value of 4 which is not allowed in filter's condition.

Note: When filter with settings *Sum root of first and last digits is...* then the filter behaves the same way as Sum Root filter.

See also Digits Sum Root statistics.

Odd/Even Numbers Sum Root

The filter is the same as Sum Root filter except that it is applied either to ticket's odd number or to ticket's even numbers only.

See also Odd/Even Numbers Sum Root statistics.

Low/High Numbers Sum Root

The filter is the same as Sum Root filter except that it is applied either to low ticket numbers or to high ticket numbers only.

See also Low/High Numbers Sum Root statistics.

Match Numbers

Filter accepts tickets that have the desired count of selected main numbers.

Use your mouse to select the numbers you're looking on ticket panel in filter window. Then choose *Match Count* table how many of the selected numbers each accepted ticket must have.

Example

When filter settings are *Match Count: 2,3,4, Numbers: 10,15,16,17,20,23,30,32* then:

- 10-11-18-20-22-39 - filter accepts this ticket because it contains two of the selected numbers: 10, 20.
- 10-15-18-20-23-32 - filter rejects this ticket because it contains five of the selected numbers: 10, 15, 20, 23, 30.

Match Tickets in File

This filter compares ticket with other tickets in a selected file. The filter accepts a ticket if it matches tickets from the file in selected count of numbers.

To use the filter, first click *Browse* button to browse for the file with tickets to be compared with filtered tickets. Then tick the desired matching combinations in the table below. The match file can be either in binary or text format.

Example

Let's assume we want to compare filtered tickets with the following ticket file:

1. 01-02-03-04-05-06
2. 01-02-03-05-44-49
3. 01-02-03-20-25-26
4. 20-21-22-30-31-32
5. 40-41-42-43-44-45

- When filter settings are *Match 3* then:
    - 01-02-03-04-05-06 - filter accepts this ticket because it matches in three numbers with ticket number 3 in the match file.
    - 43-44-45-47-48-49 - filter accepts this ticket because it contains three numbers from the last ticket in the file.
    - 20-21-22-30-33-34 - filter rejects this ticket because it contains four numbers from ticket number 4 in the file and doesn't have three numbers from any other ticket in the file.

- When filter settings are *Match 5, Match 4* then:
    - 01-02-03-04-05-06 - filter accepts this ticket because it contains four numbers from the second ticket in the file.
    - 01-20-21-22-30-31 - filter accepts this ticket because it contains five numbers from the fourth ticket in the file.
    - 42-43-44-47-48-49 - filter rejects this ticket because it contains only three numbers from the last ticket in the file.

- When filter settings are *Match 3, Max 1* then:
    - 20-21-22-40-44-45 - filter accepts this ticket because it contains three numbers from the fourth ticket in the file and doesn't match any other ticket in three numbers.
    - 01-02-03-44-45-46 - filter rejects this ticket because it contains three numbers from the first three ticket in the file and the filter condition limits that maximum count of matching ticket to one only.
    - 01-02-03-04-05-06 - filter accepts this ticket because it matches in three numbers with ticket number 3 in the file.

- When filter settings are *Match 0, Min 3* then:
    - 04-05-06-07-08-09 - filter accepts this ticket because there are three tickets in the file that don't match this ticket in any number (third, fourth and fifth).
    - 01-02-03-04-05-06 - filter rejects this ticket because there are only two ticket in the file that don't match this ticket in any number (fourth and fifth).

See also Match Numbers in File ticket filter.

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Match Numbers in File

This filter compares ticket numbers with numbers in a selected **text file**. The filter accepts a ticket if it contains selected count of numbers from that file.

To use the filter, first click *Select* button to browse for the text file with numbers to be compared with filtered tickets. Then tick the desired count(s) of matching numbers in the table below.

The file with matching numbers must follow these formatting rules:

- Each set of numbers is on a separate line of text.
- Numbers on each line are separated with space character(s) or TAB character(s) or colon (:) or semicolon (;) or comma (,) or dash (-) character. For example:
  - 1 2 3 4
  - 1:2:3:4
  - 1;2;3;4
  - 1,2,3,4
  - 1-2-3-4
- Lines starting with hash (#) character are ignored.
- The number of lines in the file is not limited.
- The count of numbers on a single line is not limited.

Example

Let's assume we want to compare filtered tickets with the following file:

01,02,03,04
01,02,03,05
01,02,03,20
20,21,22,30,31
40,41,42,43

- When filter settings are *Match 3* then:
  - 01-02-03-04-05-06 - filter accepts this ticket because it matches in three numbers with the third line in the file.
  - 41-42-43-47-48-49 - filter accepts this ticket because it contains three numbers from the last line in the file.
  - 20-21-22-30-32-33 - filter rejects this ticket because it contains four numbers from the fourth line in the file and doesn't have three numbers from any other line in the file.
  - 01-02-03-20-21-22 - filter accepts this ticket because it matches in three numbers with the fourth line in the file.
- When filter settings are *Match 5, Match 4* then:
  - 01-02-03-04-05-06 - filter accepts this ticket because it contains four numbers from the first line in the file.
  - 01-20-21-22-30-31 - filter accepts this ticket because it contains five numbers from the fourth line in the file.
  - 40-41-42-44-45-46 - filter rejects this ticket because it contains only three numbers from the last line in the file.

- When filter settings are *Match 3, Max 1* then:
  - 20-21-22-40-44-45 - filter accepts this ticket because it contains three numbers from the fourth line in the file and doesn't match any other line in three numbers.
  - 01-02-03-44-45-46 - filter rejects this ticket because it contains three numbers from the first three lines in the file and the filter condition limits that maximum count of matching lines to one only.
  - 01-02-03-04-05-06 - filter accepts this ticket because it matches in three numbers with the third line in the file.
- When filter settings are *Match 0, Min 3* then:
  - 04-05-06-07-08-09 - filter accepts this ticket because there are at least three lines in the file that don't match this ticket in any number (first, second, fourth and fifth).
  - 01-02-03-04-05-06 - filter rejects this ticket because there are only two lines in the file that don't match this ticket in any number (fourth and fifth).

See also Match Ticket in File ticket filter.

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Match Digits in File

This filter is similar to Match Numbers in File filter - it compares ticket's first/last digits with numbers in a selected **text file**. The filter accepts a ticket if it contains selected count of digits from that file.

To use the filter, first click *Select* button to browse for the text file with numbers to be compared with filtered tickets. Then tick the desired count(s) of matching digits in the table below.

The file with matching numbers must follow these formatting rules:

- Each set of numbers is on a separate line of text.
- Numbers on each line are separated with space character(s) or TAB character(s) or colon (:) or semicolon (;) or comma (,) or dash (-) character. For example:
  - 1 2 3 4
  - 1:2:3:4
  - 1;2;3;4
  - 1,2,3,4
  - 1-2-3-4
- Lines starting with hash (#) character are ignored.
- The number of lines in the file is not limited.

- The count of numbers on a single line is not limited.

Example

Let's assume we want to compare filtered tickets with the following file:

2,3
1,1,1,2,3
3,4,6,8,9
8,9,1

- When filter settings are *Last Digits, Match 3* then:
    - 01-02-03-04-05-06 - filter accepts this ticket because its first three last digits match three numbers from the second line in the file.
    - 41-43-45-46-47-49 - filter accepts this ticket because three of its last digits - 3, 6 and 9 match numbers in the third line in the file.
- When filter settings are *Last Digits, Match 3, Min 3* then:
    - 01-02-03-05-08-09 - filter accepts this ticket because it matches three digits from the second line in the file (1, 2, 3), three digits from the third line (3, 8, 9) and three digits from the last line (1, 8, 9). That's a match in three lines in the matching file as specified in *Min 3* condition.

See also Match Numbers in File ticket filter.

Standard Deviation

This filter checks the standard deviation of ticket's main numbers. Standard deviation is a mathematical formula, which evaluates how close are the ticket numbers to each other. Low standard deviation values mean that ticket numbers are very close to each other in the number pool. High standard deviation values mean that ticket numbers are from different parts of number pool.

Example

Ticket numbers *1-2-3-4-5-6* have standard deviation of 1.87. The value is low because all numbers come from the same section of number pool. The same applies to ticket numbers *44-45-46-47-48-49* which have also standard deviation of 1.87.

Ticket numbers *6-9-15-18-33-43* have standard deviation of 14.43 because the numbers come from various parts of number pool.

See also Standard Deviation statistical property.

Ticket Index Range

This filter accepts tickets that have their index within specified range. Ticket index is a number which uniquely identifies the ticket in the set of all possible number combinations. For example in 6/49 lottery, the ticket index 1 is equal to number combination 1-2-3-4-5-6, ticket index 2 equals to number combination 1-2-3-4-5-7, ticket index 3 is number combination 1-2-3-4-5-8 etc. Ticket numbers 44-45-46-47-48-49 have ticket index of 13,983,816.

To use the filter, select the minimum allowed ticket index value (inclusive) and the maximum allowed ticket index value (inclusive).

See also Ticket Index Movement filter, Ticket Index statistical property and Ticket Index Range summary statististics.

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Number Groups

This filter accepts tickets if their numbers fall into selected number groups. To use the filter, first select number groups set you wish to filter with in *Number Groups* combo box. Then tick number groups you wish to use and specify how many ticket numbers should be in each group.

Button *Customize* opens number groups customizer where you can adjust the settings of currently selected numbers groups. **Note:** All customizations are temporary only and apply to current filter only. To make permanent changes in number groups settings, use menu *Tools - Number Groups*.

Button *Toggle all groups* ticks or unticks all number group check boxes in the table above it.

Example

The default number groups set in Expert Lotto 6/49 Demo Lottery divides pool numbers into five groups: *1-10, 11-20, 21-30, 31-40, 41-49*.

- When filter settings are *Group 1-10, Numbers in group min: 2, max: 2, Group 11-20, Numbers in group min: 2, max: 2, At least 2 to 2 groups must pass* then:
  - 01-02-11-12-21-22 - filter accepts this ticket because two numbers (1, 2) are from the first group and two numbers (11, 12) are from the second group.
  - 01-02-03-11-12-21 - filter rejects this ticket because three numbers (1, 2, 3) are from the first group which is outside the allowed range.
- When filter settings are *Group 1-10, Numbers in group min: 2, max: 2, Group 11-20, Numbers in group min: 2, max: 2, At least 1 to 2 groups must pass* then:
  - 01-02-03-11-12-21 - filter accepts this ticket because two numbers (11, 12) are from the second group and it is enough if just one number group passes the condition.
  - 21-22-23-24-25-26 - filter reject this ticket because no ticket number is from the first group or from the second group.

- When filter settings are *Group 1-10, Numbers in group min: 0, max: 6, Group 11-20, Numbers in group min: 0, max: 2, Group 21-30, Numbers in group min: 0, max 2, At least 3 to 3 groups must pass, Ticket must fall into 2 to 2 groups* then:
    - 01-02-03-04-05-06 - filter rejects this ticket. The conditions for individual numbers are met - 6 numbers from the first group, 0 numbers from the second group, 0 numbers from the third group. However the ticket numbers fall into a single group only so the last filter condition isn't met and the ticket is rejected.
    - 01-02-03-04-05-11 - filter accepts this filter because 5 numbers are from the first group, one number is from the second group, no number is from the third group and ticket numbers fall into 2 distinct number groups.
    - 20-30-46-47-48-49 - filter accepts this filter because no number is from the first group, one number is from the second group, one number is from the third group and ticket numbers fall into 2 distinct number groups.

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Consecutive Numbers

The filter accepts tickets that have the desired count of *consecutive numbers*. Numbers are consecutive if each number is one higher than the preceding number. For example numbers *5,6,7* are consecutive, numbers *5,8,11* aren't consecutive.

Important: Number combinations like *15-16-17-18-20-23* are always interpreted as four consecutive numbers, such number combinations are never treated as two pairs of consecutive numbers or one triplet of consecutive numbers.

Example

- When filter settings are *The count of 2 consecutive numbers is 1 to 1* then:
    - 01-02-05-08-11-15 - filter accepts this ticket because it contains one instance of two consecutive numbers *1-2*.
    - 01-02-05-09-10-15 - filter rejects this ticket because it contains two instances of two consecutive numbers: *1-2* and *9-10*.
    - 01-02-03-05-09-11 - filter rejects this ticket because it contains one instance of three consecutive numbers: *1-2-3*.
- When filter settings are *The count of 2 consecutive numbers is 1 to 2* then:
    - 01-02-05-09-10-15 - filter accepts this ticket because it contains two instances of two consecutive numbers: *1-2* and *9-10*.
    - 01-02-05-08-11-15 - filter accepts this ticket because it contains one instance of two consecutive numbers *1-2*.
    - 01-02-03-04-09-11 - filter rejects this ticket because it contains one instance of four consecutive numbers: *1-2-3-4*.
    - 01-02-05-06-08-09 - filter rejects this ticket because it contains three instances of two consecutive numbers: *1-2*, *5-6* and *8-9*.
- When filter settings are *The count of 3 consecutive numbers is 1 to 1* then:
    - 01-02-03-09-10-15 - filter accepts this ticket because it contains one instance of three consecutive numbers: *1-2-3*.
    - 01-02-03-04-08-11 - filter rejects this ticket because it contains one instance of four consecutive numbers: *1-2-3-4*.

- 01-02-03-08-09-10 - filter rejects this ticket because it contains two instances of three consecutive numbers: *1-2-3* and *8-9-10*.

See also Consecutive Numbers statistics.

Consecutive First/Last Digits

The filter accepts tickets that have the desired count of *consecutive first or last digits*. Each pool number breaks down into two digits. The *first digit* is the leading digit of the number, the *last digit* is the second digit of the number. For example the first digit of number 23 is 2, the last digit of that number is 3. The first digit of number 9 is 0, the last digit of that number is 9.
Digits are consecutive if each digit is one higher than the preceding digit. For example digits *5,6,7* are consecutive, digits *5,7,9* aren't consecutive.

Important: Last digit sequences like *15-16-17-18-20-23* are always interpreted as four consecutive digits (5,6,7,8), such combinations are never treated as two pairs of consecutive digits or one triplet of consecutive digits. The same applies to first digits.

Example

- When filter settings are *The count of 2 consecutive last digits is 1 to 1* then:
  - 01-02-05-08-11-15 - filter accepts this ticket because it contains one instance of two consecutive last digits *1-2*.
  - 01-02-05-08-09-15 - filter rejects this ticket because it contains two instances of two consecutive last digits: *1-2* and *8-9*.
  - 01-02-03-05-09-11 - filter rejects this ticket because it contains one instance of three consecutive last digits: *1-2-3*.
- When filter settings are *The count of 2 consecutive last digits is 1 to 2* then:
  - 01-02-05-08-09-15 - filter accepts this ticket because it contains two instances of two consecutive last digits: *1-2* and *8-9*.
  - 01-02-05-08-11-15 - filter accepts this ticket because it contains one instance of two consecutive last digits *1-2*.
  - 01-02-03-04-09-11 - filter rejects this ticket because it contains one instance of four consecutive last digits: *1-2-3-4*.
  - 11-12-25-26-38-39 - filter rejects this ticket because it contains three instances of two consecutive last digits: *1-2*, *5-6* and *8-9*.
- When filter settings are *The count of 3 consecutive last digits is 1 to 1* then:
  - 01-02-03-09-10-15 - filter accepts this ticket because it contains one instance of three consecutive last digits: *1-2-3*.
  - 11-12-23-24-38-41 - filter rejects this ticket because it contains one instance of four consecutive last digits: *1-2-3-4*.
  - 01-02-03-17-28-29 - filter rejects this ticket because it contains two instances of three consecutive last digits: *1-2-3* and *7-8-9*.

See also Consecutive Numbers filter.

Consecutive First/Last Digits In Any Order

This filter accepts tickets that have the desired count of first/last digits that are consecutive regardless of their order.

Each pool number breaks down into two digits. The *first digit* is the leading digit of the number, the *last digit* is the second digit of the number. For example the first digit of number 23 is 2, the last digit of that number is 3. The first digit of number 9 is 0, the last digit of that number is 9.
Digits are consecutive if each digit is one higher than the preceding digit. For example digits *5,6,7* are consecutive, digits *5,7,9* aren't consecutive.

Example

- When filter settings are *The count of any-order consecutive last digits is 6 to 6* then:
  - 16-23-24-35-42-47 - filter accepts this ticket because its last digits are 6, 3, 4, 5, 2, 7. When sorted in ascending order the last digits form a sequence of six consecutive digits: 2-3-4-5-6-7.
  - 07-12-16-26-27-35 - filter rejects this ticket because its last digits are 7, 2, 6, 6, 7, 5. Sorted in ascending order the digits are 2,5,6,6,7,7. The longest consecutive sequence is only three digits: 5-6-7.
- When filter settings are *The count of any-order consecutive last digits is 2 to 2* then:
  - 11-14-20-26-27-33 - filter accepts this ticket because its last digits are 1, 4, 0, 6, 7, 3. After sorting in ascending order we can see that at most two digits are consecutive: 0, 1, 3, 4, 6, 7.
  - 09-10-11-12-15-33 - filter rejects this ticket because its last digits are 9, 0, 1, 2, 5, 3. After sorting in ascending order: 0, 1, 2, 3, 5, 9 we can see there is a sequence of four consecutive digits: 0-1-2-3.

See also Consecutive First/Last Digits In Any Order statistics and Consecutive Digits ticket filter.

Consecutive Pairs

This filter accepts tickets that contain selected *pairs of consecutive numbers*. A pair of numbers is consecutive if the second number in the pair is one higher then the first pair number. For example number pair 5-6 is consecutive, number pair 5-7 is not consecutive.

To use this filter, first select the desired consecutive pairs in the table then choose how many selected pairs each ticket must have to be accepted by the filter.
For example in a 6/xx lottery there can be up to 3 pairs of consecutive numbers in a single ticket, e.g. 1-2-4-5-7-8.

▶ You can tick/untick multiple consecutive pairs with a single mouse click - first highlight the desired pairs with your mouse then click any of the highlighted pairs.

Note: Number combinations like 1-2-3-4-10-15 are interpreted as one instance of four consecutive numbers, it is never evaluated as two pairs of consecutive numbers.

Example

Filtering with settings *Select Pairs: 1-2, 2-3, 3-4, 4-5, 5-6, 7-8, 8-9, 9-10, 10-11, Minimum count in a ticket: 2, maximum: 2* accepts for example ticket *1-4-5-9-10-37* as it contains two of the selected pairs: 4-5 and 9-10. However the filter rejects tickets like *1-2-5-6-9-10* because it contains three selected pairs and the allowed maximum is 2. The same filter also rejects tickets like *1-2-3-4-20-30* as it contains a consecutive quad and not the required two consecutive pairs.

See also [Consecutive Pairs](#) statistics.

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Consecutive Triplets

This filter accepts tickets that contain selected *triplets of consecutive numbers*. A triplet of numbers is consecutive if each number is one higher than the preceding one. For example number triplet *5-6-7* is consecutive, number triplet *5-6-8* is not consecutive.

To use this filter, first selected the desired consecutive triplets in the table then choose how many selected triplets each ticket must have to be accepted by the filter. For example in a 6/xx lottery there can be up to 2 triplets of consecutive numbers in a single ticket, e.g. *1-2-3-5-6-7*.

▶ You can tick/untick multiple consecutive triplets with a single mouse click - first highlight the desired triplets with your mouse then click any of the highlighted triplets.

Note: Number combinations like *1-2-3-4-5-6* are interpreted as one instance of six consecutive numbers, it is never evaluated as two triplets of consecutive numbers.

Example

Filtering with settings *Select Triplets: 1-2-3, 5-6-7, Minimum count in a ticket: 1, maximum: 1* accepts for example ticket *5-6-7-10-20-30* as it contains the selected triplet: 5-6-7 or ticket *5-6-7-10-11-12*.

Filtering with settings *Select Triplets: 1-2-3, 5-6-7, Minimum count in a ticket: 2, maximum: 2* accepts only a single ticket: *1-2-3-5-6-7*. There are no other ticket matching such filter settings.

See also [Consecutive Triplets](#) statistics.

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Consecutive Quads

This filter accepts tickets that contain selected quads of *consecutive numbers*. A quad of numbers is *consecutive* if each number is one higher than the preceding one. For example number quad *5-6-7-8* is consecutive, number quad *5-6-7-9* is not consecutive.

To use this filter, first select the desired consecutive quads in the table then choose how many selected quads each ticket must have to be accepted by the filter. For example in a 6/xx lottery there can be only a single quad of consecutive numbers in a single ticket, e.g. 1-2-3-4-6-7. In a 10/xx Keno lottery there can be up to two quads of consecutive numbers in a single ticket, e.g. 1-2-3-4-6-7-8-9-11-12.

▶ You can tick/untick multiple consecutive quads with a single mouse click - first highlight the desired quads with your mouse then click any of the highlighted quads.

Note: Number combinations like *1-2-3-4-5-6* are interpreted as one instance of six consecutive numbers, it is never evaluated as a quad of consecutive numbers.

Example

Filtering with settings *Select Quads: 1-2-3-4, 2-3-4-5, Minimum count in a ticket: 1, maximum: 1* accepts for example ticket *1-2-3-4-6-7* or ticket *2-3-4-5-7-8*. The filter rejects for example ticket *1-2-3-4-5-7* because it contains five consecutive numbers instead of the desired four.

See also Consecutive Quads statistics.

Ticket Panel

This filter selects tickets according to the layout of their numbers in number grid on paper playslip. The filter accepts tickets that have given maximum count of numbers in a single row of the number grid and/or the given count of numbers in a single column of the number grid.

To use the filter, first check whether you want to filter the count of numbers in a panel's *row* or in panel's *column* or both. Then enter the minimum and maximum count of ticket numbers in panel's row or column respectively.

Example - Expert Lotto 6/49 Demo Lottery

The number grid in Expert Lotto 6/49 lottery looks like this:

1	2	3	4	5
6	7	8	9	10
11	12	13	14	15
16	17	18	19	20
21	22	23	24	25
26	27	28	29	30
31	32	33	34	35
36	37	38	39	40
41	42	43	44	45
46	47	48	49	

- When filter settings are *Maximum count of ticket numbers in any ticket panel's column is 3 to 4, row is 3 to 3* then:
  - 01-02-03-06-07-11 - filter accepts this ticket, because there are 3 numbers in the panel's row with the most numbers and 3 numbers in the panel's column that has the most numbers.
  - 01-02-03-04-05-06 - filter rejects this ticket because there are 5 numbers in a single panel's row which is outside the allowed range.
- When filter settings are *Maximum count of ticket numbers in any ticket panel's column is 5 to 6* then:
  - 22-27-32-37-42-47 - filter accepts this ticket because all its numbers are in a single column.
  - 01-02-07-12-17-22 - filter accepts this ticket because it has 5 numbers in a single column.
  - 01-02-06-07-11-16 - filter rejects this ticket because it has at most four numbers in a single column.
- When filter settings are *Maximum count of ticket numbers in any ticket panel's column is 6 to 6, row is 5 to 5* then the filter doesn't accept any ticket. There are six numbers in each ticket and it isn't possible to have six ticket numbers in a single column and five ticket numbers in a single row at the same time.

See also Ticket Panel statistics.

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Neighbors Distance

The filter compares the differences of ticket numbers at neighboring ticket positions. For example in a ticket 1-10-15-18-34-40 the neighboring numbers are 1 and 10, their distance is *10-1=9*. Another pair of neighbors are 10 and 15, their distance is *15-10=5*. Other neighboring numbers are 15 and 18, 18 and 34 and 34 and 40.

Example

Filtering with settings *5 to 5 neighboring numbers have distance of 1 to 1* accepts only tickets like 1-2-3-4-5-6 as the difference of all five neighboring pairs is one.

Filtering with settings *2 to 3 neighboring numbers have distance of 5 to 10* accepts for example ticket 5-8-21-28-33-42 because neighbors 21 and 28, 28 and 33 and 33 and 42 have the distance in the range of 5 to 10. However, for example ticket 3-8-21-28-33-42 is rejected because there are four neighboring pairs of

numbers with the distance in the given range.

Ticket Range

This filter evaluates the difference between ticket numbers at selected ticket positions. The filter accepts a ticket if the difference of at least one or all numbers at selected neighboring positions is within given range.

Note: In a 6/xx lottery the filter settings *The maximum difference of every 6 neighboring numbers is X to Y* is equal to filter settings *The maximum difference of any 6 neighboring numbers is X to Y*.

Example

- When filter settings are *The maximum difference of every 2 neighboring numbers is 1 to 1* then:
  - 01-02-03-04-05-06 - filter accepts this ticket because the difference of numbers at positions 2 and 1 is one, the difference of numbers at positions 3 and 2 is one etc.
  - 01-03-04-05-06-07 - filter rejects this ticket because the difference of numbers at positions 2 and 1 is two which is out of allowed range.
- When filter settings are *The maximum difference of any 2 neighboring numbers is 1 to 1* then:
  - 01-02-10-20-30-40 - filter accepts this ticket because there is at least one pair of two neighboring numbers with the difference of one, they are numbers 2 and 1.
  - 01-03-10-20-30-40 - filter rejects this ticket because there no two numbers with a difference of one.
- When filter settings are *The maximum difference of every 3 neighboring numbers is 5 to 5* then:
  - 27-31-32-36-37-41 - filter accepts this ticket because 32-27=5 and 36-31=5 and 37-32=5 and 41-36=5
  - 27-31-32-36-37-42 - filter rejects this ticket because 32-27=5 and 36-31=5 and 37-32=5 but 42-36=6 which is outside the allowed range.
- When filter settings are *The maximum difference of every 6 neighboring numbers is 10 to 15* then:
  - 35-36-38-43-44-45 - filter accepts this ticket because the difference between 6th and 1st ticket numbers is 45-35=10
  - 20-31-32-33-34-35 - filter accepts this ticket because 35-20=15
  - 19-31-32-33-34-35 - filter rejects this ticket because because the difference between the last and the first ticket numbers is 35-19=16 which is outside the allowed range.
- When filter settings are *The maximum difference of any 3 neighboring numbers is 1 to 1* then the filter doesn't accept any ticket. Numbers cannot repeat in a regular Jackpot lottery so the lowest possible difference of any three numbers in any ticket is 2.

First/Last Digits

This filter accepts only tickets that contain specified *first/last digits*. Each pool number breaks down into two digits. The *first digit* is the leading digit of the number, the *last digit* is the second digit of the number. For example the first digit of number 23 is 2, the last digit of that number is 3. The first digit of number 9 is 0, the last digit of that number is 9.

Example

- When filter settings are *Last digits: 1,2,3, At least 2 to 2 digits must be present* then:
    - 02-03-14-15-26-37 - filter accepts this ticket because it contains last digits 2 and 3.
    - 12-13-21-30-37-47 - filter rejects this ticket because it contains last digits 1, 2, 3 and the condition is that at most two digits can be present in a single ticket.
    - 11-20-30-40-47-49 - filter rejects this ticket because it contains only one of the selected last digits.
- When filter settings are *First digits: 0,1,2, At least 1 to 3 digits must be present* then each accepted ticket will have at least one and at most three numbers from the range of 1 to 29.

Note: In a x/49 lottery there is no number with the first digit 5, 6, 7, 8 or 9 because all pool numbers are lower than 50. So the highest possible first digit for that lottery type is 4.

Repeating Digits

This filter accepts tickets that have selected count of *repeating first* or *last digits*. Each pool number breaks down into two digits. The *first digit* is the leading digit of the number, the *last digit* is the second digit of the number. For the first digit of number 23 is 2, the last digit of that number is 3. The first digit of number 9 is 0, the last digit of that number is 9.

Example

- When filter settings are *1 to 1 first digits repeat 6 to 6 times* then
    - 20-21-22-23-24-25 - filter accepts this ticket because first digit 2 repeats 6 times.
    - 01-02-03-04-05-06 - filter accepts this ticket because first digit 0 repeats 6 times.
    - 01-02-03-04-05-10 - filter rejects this ticket because first digit 0 repeats 5 times only.

- When filter settings are *3 to 3 last digits repeat 2 to 2 times* then
  - 08-09-18-26-29-36 - filter accepts this ticket because last digit 8 repeats two times (8, 18), last digit 9 repeats two times (9, 29) and last digit 6 repeats also two times (26, 36).
  - 08-09-18-26-29-38 - filter reject this ticket because last digit 8 repeats three times (8, 18, 38) which is outside the allowed range.
- When filter settings are *6 to 6 last digits repeat 2 to 2* times then the filter doesn't accept any ticket because there can at most 6 unique last digits in a 6/xx lottery.

Digits Count

The filter accepts tickets that have the desired count of first or last digits. The *first digit* is the leading digit of the number, the *last digit* is the second digit of the number. For example the first digit of number 23 is 2, the last digit of that number is 3. The first digit of number 9 is 0, the last digit of that number is 9.

Example
- When filter settings are *Last digits: 0: 0-6, 1: 0-6, 2: 3-3, 3: 0-6, 4: 0-6, 5: 0-6, 6: 0-6, 7: 0-6, 8: 0-6, 9: 0-6* then the filter accepts tickets that have exactly three last digits 2. For example ticket 1-2-3-4-12-22 or 22-32-42-43-44-45.
- When filter settings are *Last digits: 0: 0-6, 1: 0-6, 2: 3-3, 3: 0-6, 4: 0-6, 5: 0-6, 6: 3-3, 7: 0-6, 8: 0-6, 9: 0-6* then each accepted ticket will have three last digits 2 and three last digits 6. For example 2-6-12-16-22-26 or 12-22-26-32-36-46.
- When filter settings are *Last digits: 0: 0-6, 1: 0-6, 2: 6-6, 3: 0-6, 4: 0-6, 5: 0-6, 6: 6-6, 7: 0-6, 8: 0-6, 9: 0-6* then all tickets will be rejected. It isn't possible for a ticket to have 6 last digits of one kind and 6 last digits of some other kind.

Note: In a x/49 lottery there is no number with the first digit 5, 6, 7, 8 or 9 because all pool numbers are lower than 50. So the highest possible first digit for that lottery type is 4.

Arithmetic Complexity

The filter accepts tickets that have [Arithmetic Complexity](#) value in selected range.

See also statistics.

Bonus Numbers

This filter accepts tickets with selected bonus or powerball numbers. To use the filter, select the bonus number(s) you wish to filter on the ticket panel using your mouse.

Note: This filter is available only for Powerball-like lotteries, which draw one or more bonus numbers from a separate pool.

Example - Expert Lotto Powerball Demo Lottery

When filter settings are *Bonus Numbers: 1, 3, 5* then

- 01-02-03-04-05-06-07-[1] - filter accepts this ticket because its bonus numbers is 1.
- 01-02-03-04-05-06-07-[3] - filter accepts this ticket because its bonus numbers is 3.
- 01-02-03-04-05-06-07-[2] - filter rejects this ticket because its bonus numbers is 2.

Match Winning Numbers

This filter compares filtered tickets with selected past winning numbers draws.

Example

The latest five draws in Expert Lotto 6/49 Demo Lottery are:

```
2010/27, Sun 2nd, 01-06-12-24-32-41-[44]
2010/28, Wed 1st, 16-18-22-23-28-29-[24]
2010/28, Wed 2nd, 02-13-16-17-25-40-[27]
2010/28, Sun 1st, 06-13-14-19-41-42-[29]
2010/28, Sun 2nd, 23-29-36-42-44-47-[07]
```

Filtering with settings *Winning Numbers: 5 latest draws, Match 4* accepts for example ticket 1-6-12-15-24-42 as it matches draw *2010/27 Sun 2nd* in four numbers (1,6,12,24). Filter rejects for example ticket 23-30-36-42-44-47 as it matches five numbers from draw *2010/28 Sun 2nd*.

Filtering with settings *Winning Numbers: 5 latest draws, Match 3, Min 2* accepts for example ticket 13-14-16-19-35-40 as it matches 3 numbers from draw *2010/28 Wed 2nd* and three numbers from draw *2010/28 Sun 1st*.

See also [Match Previous Draws](#) statistics.

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Match Winning Digits

This filter accepts tickets that have selected count of same first or last digits as selected past draws.

Each pool number breaks down into two digits. The *first digit* is the leading digit of the number, the *last digit* is the second digit of the number. For example the first digit of number 23 is 2, the last digit of that number is 3. The first digit of number 9 is 0, the last digit of that number is 9.

Example

The latest five draws in Expert Lotto 6/49 Demo Lottery are:

```
2010/27, Sun 2nd, 01-06-12-24-32-41-[44]
2010/28, Wed 1st, 16-18-22-23-28-29-[24]
2010/28, Wed 2nd, 02-13-16-17-25-40-[27]
2010/28, Sun 1st, 06-13-14-19-41-42-[29]
2010/28, Sun 2nd, 23-29-36-42-44-47-[07]
```

Filtering with settings *Winning Numbers: 5 latest draws, Match last digits min: 6, max: 6* accepts for example ticket 1-2-3-4-6-9 because it has the same last digits as draw *2010/28, Sun 1st* (note that the digits don't have to match at the same ticket positions). The same settings accepts also ticket e.g. 1-6-22-24-31-42 because its last digits are the same as in draw *2010/27, Sun 2nd*. The filter rejects for example ticket 1-2-3-4-5-6 because none of the selected past draws has the same last digits.

Filtering with settings *Winning Numbers: 1 latest draw, Match last digits min: 3, max: 6* accepts all tickets that have at least three same last digits as the latest draw *2010/28, Sun 2nd*. That means at least three digits from 2, 3, 4, 6, 7 or 9.

See also [Match Winning Numbers](#) filter.

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Match Bonus

This filter accepts tickets that have selected count of bonus numbers matching from selected past draws.

The filter is available only for lotteries that draw one or more bonus number from the same pool as the main numbers - Jackpot-like lotteries.

Example

The latest five draws in Expert Lotto 6/49 Demo Lottery are:

```
2010/27, Sun 2nd, 01-06-12-24-32-41-[44]
2010/28, Wed 1st, 16-18-22-23-28-29-[24]
2010/28, Wed 2nd, 02-13-16-17-25-40-[27]
2010/28, Sun 1st, 06-13-14-19-41-42-[29]
2010/28, Sun 2nd, 23-29-36-42-44-47-[07]
```

Filtering with settings *Winning Numbers: 5 latest draws, Match bonus min: 3, max: 3* accepts tickets that contain exactly 3 bonus numbers from the latest 5 draw. That means tickets that contain exactly three numbers from 44, 24, 27, 29, 7, for example ticket 1-2-3-7-24-27. The filter rejects for example ticket 1-2-7-24-27-29 because it contains four bonus numbers from the latest 5 draws which is outside the allowed range.

See also Match Winning Numbers filter.

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Highest Match

This filter is similar to Match Winning Numbers filter as it also compares the filtered tickets with selected past draws. Filter accepts a ticket if it matches the selected past draws. For example if *Match 4* is selected in the filter window then the filter accepts all tickets that match any of selected past draws in four numbers. However the accepted ticket cannot match other selected draws in five or six numbers (unlike the *Match Winning Numbers* filter where this is allowed).

Example

The latest five draws in Expert Lotto 6/49 Demo Lottery are:

```
2010/27, Sun 2nd, 01-06-12-24-32-41-[44]
2010/28, Wed 1st, 16-18-22-23-28-29-[24]
2010/28, Wed 2nd, 02-13-16-17-25-40-[27]
2010/28, Sun 1st, 06-13-14-19-41-42-[29]
2010/28, Sun 2nd, 23-29-36-42-44-47-[07]
```

Filtering with settings *Winning Numbers: 5 latest draws, Match 2* accepts for example ticket 1-2-3-4-5-6 as it matches draw *2010/27 Sun 2nd* in two numbers (1,6) and there is no higher match with any other draw.
Filter rejects for example ticket 1-12-24-47-48-49 because it matches draw *2010/27 Sun 2nd* in three numbers and only match 2 is allowed in filter condition.
Filter also rejects for example ticket 6-14-25-36-39-41. The ticket does match draw *2010/27 Sun 2nd* in two numbers however there is also higher match in three numbers with draw *2010/28 Sun 1st* (numbers 6,14,41).

Filtering with settings *Winning Numbers: 5 latest draws, Match 6* accepts only tickets that have the same numbers as the latest 5 draws. The filtering results are then the same as when using *Match Winning Numbers* filter with the same settings.

See also Match Previous Draws statistics and Match Winning Numbers filter.

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Hot/Cold Numbers

This filter accepts tickets that have selected count of hot and cold numbers. Numbers are *hot* when they have been drawn very frequently in the last few draws, *cold* numbers are those which haven't been drawn at all or only once or twice in the last few draws.

Example - Expert Lotto 6/49 Demo Lottery

When filter settings are *Winning Numbers: 20 latest draws, Hot numbers: 1 to 2, Cold numbers 1 to 2, Hot number must hit at least 4 times, Cold number can hit at most 1 times* then:

- 01-02-03-04-05-06 - filter accepts this ticket because it has one hot number (6) and two cold numbers (3 and 4). Number 6 hit four times in the latest 20 draws so it is a hot number, number 3 haven't hit at all and number 4 hit just once in the past 20 draws so they are cold numbers.
- 01-02-03-04-05-07 - filter rejects this ticket because it has three cold numbers (3,4 and 7) and no hot number.

When filter settings are *Winning Numbers: 20 latest draws, Hot numbers: 6 to 6, Cold numbers 0 to 0, Hot number must hit at least 4 times, Cold number can hit at most 1 times* then:

- 06-11-12-23-25-29 - filter accepts this ticket because all its numbers are hot - its numbers repeat at least four times in the past 20 draws.
- 01-06-11-12-23-25 - filter rejects this ticket because it has only 5 hot numbers. Number 1 hit three times in the past 20 draws so it's neither hot and neither cold number.

When filter settings are *Winning Numbers: 20 latest draws, Hot numbers: 4 to 4, Cold numbers 4 to 4, Hot number must hit at least 4 times, Cold number can hit at most 1 times* then the filter will reject all tickets. There are only 6 numbers in each ticket and a ticket number cannot be hot and cold at the same time.

See also Hot/Cold Numbers statistics and Hot/Cold Numbers coloring.

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Ticket Index Movement

This filter compares the ticket index of filtered tickets with the index of the latest past winning numbers draw. The filter accepts tickets that have given distance from the selected latest draw in the list of all possible combinations. The lowest possible ticket index movement value is 0.0 meaning that the ticket numbers are the same as in the latest draw. The highest possible value is 0.999999999. This happens only if ticket numbers are 1-2-3-4-5-6 and the latest winning numbers are 44-45-46-47-48-49 or vice versa (applies to 6/49 lottery).

To use the filter, first select past winning number draws to compare filtered tickets with. Please note that only the very latest draw from the selected draws is used when calculating ticket index movement. Then enter the desired range for ticket index movement value.

Note: The number of decimal places in input fields depends on the number of decimal places selected in Options window.

Example - Expert Lotto 6/49 Demo Lottery

When filter settings are *Winning Numbers: 10 latest draws, Ticket index movement min: 0.0001, max: 0.0002* then the filtered tickets are being compared with the latest draw *2010/28 Sun 2nd*. The winning numbers for that draw are 23-29-36-42-44-47-[7] and their ticket index is *13,737,320*.

- 23-29-31-36-37-40 - filter accepts this ticket. Its ticket index is 13,734,661 so the ticket index movement is *(13,737,320 - 13,734,661) / 13,983,816 = 0.00019* which is in the allowed range.
- 13-26-27-41-47-49 - filter rejects this ticket. Its ticket index is 11,995,003 so the index movement is *(13,737,320 - 11,995,003) / 13,983,816 = 0.12459* which is outside the allowed range.

See also Ticket Index Range filter and Ticket Index Movement statistical property.

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Ticket Index Movement

This filter is very similar to Ticket Index Movement filter except that this filter makes difference between negative ticket index movement and positive ticket index movement. A ticket has positive index movement when its numbers are higher than the numbers of the latest selected draw. Negative ticket index movement means ticket numbers are lower than the number of the latest selected draw.
The lowest possible positive ticket index movement value is 0.0 meaning that the ticket numbers are the same as in the latest draw. The highest possible positive ticket index movement value is 0.999999999. This happens only if ticket numbers are 44-45-46-47-48-49 and the latest winning numbers are 1-2-3-4-5-6 (applies to 6/49 lottery).
The lowest possible negative ticket index movement value is -0.999999999. This happens only if ticket numbers are 1-2-3-4-5-6 and the latest winning numbers are 44-45-46-47-48-49 (applies to 6/49 lottery). The highest possible negative ticket index value is 0.0 meaning that the ticket numbers are the same as in the latest draw.

To use the filter, first select past winning number draws to compare filtered tickets with. Please note that only the very latest draw from the selected draws is used when calculating ticket index movement. Then enter the desired range for positive ticket index movement value and the desired range for negative ticket index movement value.

Note: The number of decimal places in input fields depends on the number of decimal places selected in Options window.

Example - Expert Lotto 6/49 Demo Lottery

When filter settings are *Winning Numbers: 10 latest draws, Positive ticket index movement min: 0.01, max: 0.02, Negative ticket index movement min: -0.01, max: -0.02* then the filtered tickets are being compared with the latest draw *2010/28 Sun 2nd*. The winning numbers for that draw are 23-29-36-42-44-47-[7] and their ticket index is *13,737,320*.

- 20-25-27-28-46-49 - filter accepts this ticket. Its ticket index is 13,457,644 so the ticket index movement is *(13,457,644 - 13,737,320) / 13,983,816 = -0.02* which is in the allowed range.
- 26-33-35-36-38-49 - filter accepts this ticket. Its ticket index is 13,877,159 so the ticket index movement is *(13,877,159 - 13,737,320) / 13,983,816 = 0.01* which is in the allowed range.
- 13-26-27-41-47-49 - filter rejects this ticket. Its ticket index is 11,995,003 so the index movement is *(11,995,003 - 13,737,320) / 13,983,816 = -0.12* which is outside the allowed range.

See also Ticket Index Movement filter and Ticket Index Movement statistical property.

Ticket Index Movement

This filter evaluates individual digits (or positions) in the ticket index value of filtered tickets. Ticket index is a number which uniquely identifies the ticket in the set of all possible number combinations. For example in 6/49 lottery, the ticket index 1 is equal to number combination 1-2-3-4-5-6, ticket index 2 equals to number combination 1-2-3-4-5-7, ticket index 3 is number combination 1-2-3-4-5-8 etc. Ticket numbers 44-45-46-47-48-49 have ticket index of 13,983,816.
That means there are 8 positions the filter can work with. The digits in ticket index 1 are *0, 0, 0, 0, 0, 0, 0 and 1* and digits in ticket index 13,983,816 are *1,3,9,8,3,8,1 and 6*.

Example

When filter settings are *Position 8: 3, 4, At least 1 to 1 positions must pass* then the filter will select tickets that have ticket index value ending with 3 or 4. For example ticket 1-2-3-4-5-8 with ticket index value of *3* or 12-27-35-38-40-47 with ticket index value Ticket Index *11,631,494*.

See also Ticket Index Range filter and Ticket Index Positions statistics

Repeating Numbers

This filter accepts tickets that contain selected count of numbers that repeat from past winning numbers draws.

Example

The latest five draws in Expert Lotto 6/49 are:

2010/27 Sun 2nd, 01-06-12-24-32-41-[44]
2010/28 Wed 1st, 16-18-22-23-28-29-[24]
2010/28 Wed 2nd, 02-13-16-17-25-40-[27]
2010/28 Sun 1st, 06-13-14-19-41-42-[29]
2010/28 Sun 2nd, 23-29-36-42-44-47-[07]

So the draw numbers from the last five draws are: *1,2,6,12,13,14,16,18,19,22,23,24,25,28,29,32,36,40,41,42,44* and *47*.

When filter settings are *Winning Numbers: 5 latest draws, Min: 3, Max: 3* then:

- 01-02-03-04-05-06 - filter accepts this ticket because it contains three numbers that repeat from the latest five draws: 1, 2 and 6.
- 15-16-26-27-29-42 - filter accepts this ticket because it contains three repeating numbers: 16, 29 and 42.
- 14-16-26-27-29-42 - filter rejects this ticket because it contains four repeating numbers: 14, 16, 29 and 42 which is outside the allowed range.

See also Repeating Numbers statistics.

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Repeating Digits

This filter accepts tickets that contain selected count of first or last digits that repeat from past winning numbers draws.

Example

The latest two draws in Expert Lotto 6/49 Demo Lottery are:

2010/28 Sun 1st, 06-13-14-19-41-42-[29]
2010/28 Sun 2nd, 23-29-36-42-44-47-[07]

So the last digits from the latest two draws are: *1,2,3,4,6,7* and *9*.

When filter settings are *Winning Numbers: 2 latest draws, Min: 3, Max: 3* then:

- 01-02-03-04-05-06 - filter rejects this ticket because it contains five last digits that repeat from the latest two draws: 1, 2, 3, 4 and 6.
- 10-11-14-30-36-38 - filter accepts this ticket because it contains three repeating last digits: 1, 4 and 6.
- 14-16-26-27-29-42 - filter rejects this ticket because it contains all its last digits repeat from the previous two draws.

See also filter.

Adjacent Numbers

The filter accepts tickets that have desired count of numbers that are adjacent to the numbers of the latest draw. A number is adjacent to some other number if it is one lower or one higher than the other number.

Optionally it is possible to adjust the distance of adjacent numbers using *+/-1* to *+/-5* check boxes. For example selecting option *+/-4* means that a number will be adjacent to some other number if it is greater by 4 or lower by 4 than that other number.

Note: The filter compares the numbers of filtered tickets with the numbers of the latest draw within the past draws selected in filter window. So selecting for example *Winning Numbers: All draws* and *Winning Numbers: 10 latest draws* in Expert Lotto 6/49 Demo lottery has the same effect, the adjacent numbers will be compared to the very latest draw which is *2010/28 Sun 2nd*.

Example

The latest draw in Expert Lotto 6/49 Demo Lottery is:

```
2010/28, Sun 2nd, 23-29-36-42-44-47-[07]
```

Filtering with settings *Winning Numbers: All draws, Adjacent numbers: +/-1, min: 2 max: 4* accepts for example ticket 1-2-3-4-22-24. The last two numbers of that ticket are adjacent to number 23 in the latest draw.
Filter rejects for example ticket 24-30-37-43-45-48 because all its numbers are adjacent to the winning numbers from the latest draw and the filter condition allows 4 such numbers at most.

Filtering with settings *Winning Numbers: All draws, Adjacent numbers: +/-1, min: 2 max: 4, Match ticket positions,* accepts for example ticket 1-2-3-4-43-46. The last two numbers of that ticket are adjacent to numbers 44 and 47 respectively in the latest draw at the same ticket positions.
Filter rejects for example ticket 1-2-3-4-22-24 because even though it does contain two adjacent numbers 22 and 24, those numbers are not at the same ticket positions as in the latest draw.

Filtering with settings *Winning Numbers: All draws, Adjacent numbers: +/-5, min: 6 max: 6, Match ticket positions,* accepts only a single ticket 18-24-31-37-39-42. All its numbers are greater or lower by 5 when compared with the winning numbers of the latest draw at the same ticket positions.

Filtering with settings *Winning Numbers: All draws, Adjacent numbers: +/-2, +/-5, min: 3 max: 3, Match ticket positions,* accepts for example ticket 1-2-3-37-39-45. Numbers 37 and 39 are lower by five than numbers 42 and 44 at appropriate ticket position in the latest draw. The last number 45 is lower by two than the last number 47 in the latest draw. That is exactly three such numbers as specified in filter condition.
Filter rejects for example ticket 1-2-3-37-39-44 because the distance between its last number 44 and number 47 from the latest draw is -3. The filter condition allows only distance +/-2 or +/-5.

See also statistics and filter.

Adjacent Digits

The filter accepts tickets that have the desired count of first or last digits that are adjacent to the digits of the latest draw. A digit is adjacent to some other digit if it is one higher or one lower than the other digit.

Note: The filter compares the digits of filtered tickets with the digits of the latest draw within the past draws selected in filter window. So selecting for example *Winning Numbers: All draws* and *Winning Numbers: 10 latest draws* in Expert Lotto 6/49 Demo lottery has the same effect, the adjacent digits will be compared to the very latest draw which is *2010/28 Sun 2nd*.

Example

The latest draw in Expert Lotto 6/49 Demo Lottery is:

`2010/28, Sun 2nd, 23-29-36-42-44-47-[07]`

Filtering with settings *Winning Numbers: All draws, Adjacent Last digits min: 2 max: 4* accepts for example ticket 1-2-3-4-9-10. The last digit of number 1 is adjacent to number 42 from the latest draw. The last digit of number 2 is adjacent to number 23 of the latest draw. The last digit of number 3 is adjacent to numbers 42 and 44 of the latest draw. That is 3 adjacent last digits in total.

Filter rejects for example ticket 1-2-3-4-5-6 because all its last digits are adjacent to the last digits of the latest draw and the filter condition allows at most 4 such digits.

Filtering with settings *Winning Numbers: All draws, Adjacent Last digits min: 2 max: 4*, *Match ticket position* accepts for example ticket 1-2-5-9-10-16. The last digit of number 5 is adjacent to number 36 at the same position in the latest draw. And the last digit of number 16 is adjacent to the last digit of number 47 from the previous draw. That is 2 adjacent last digits in total.

Filter rejects for example ticket 1-2-3-4-9-10 because no last digit is adjacent to the last digits of the latest draw when comparing by ticket position.

See also Adjacent Digits statistics and Adjacent Numbers filter.

Knight's Move

The filter accepts tickets that have selected count of numbers that made chess-like knight's move when compared with the latest draw. Please refer to Knight's Move statistics to see what knight's move mean.

To use this filter, first select past draws to compare the filter tickets with. Then choose how many numbers must make the L-shaped knight's move in accepted tickets.

Note: The filter compares the numbers of filtered tickets with the numbers of the latest draw within the past draws selected in filter window. So selecting for example *Winning Numbers: All draws* and *Winning Numbers: 10 latest draws* in Expert Lotto 6/49 Demo lottery has the same effect, the filtered numbers will be compared to the very latest draw which is *2010/28 Sun 2nd*.

Example

The latest draw in Expert Lotto 6/49 Demo Lottery is:

`2010/28, Sun 2nd, 23-29-36-42-44-47-[07]`

Filtering with settings *Winning Numbers: 1 latest draw, Knight's move numbers min: 6 max: 6* accepts for example ticket 2-4-8-10-11-15 because all its numbers made knight's move jump when compared with the latest draw. 2 -> 23, 4 -> 23, 8 -> 29, 10 -> 29, 11 -> 23, 15 -> 36.
Filter rejects for example ticket 1-2-3-4-5-6 because only two its numbers made knight's move when compared with the latest draw (numbers 2 and 4).

Filtering with settings *Winning Numbers: 1 latest draw, Knight's move numbers min: 6 max: 6*, *Match ticket positions* accepts for example ticket 2-8-15-21-23-26 because all its numbers made knight's move jump when compared with the winning numbers of the latest draw at the same ticket positions. 2 -> 23, 8 -> 29, 15 -> 36, 21 -> 42, 23 -> 44, 26 -> 47.
Filter rejects for example ticket 2-4-8-10-11-15. Its numbers did make knight's move when compared to the latest winning numbers however the ticket positions do not match.

See also Knight's Move statistics.

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Number Movement Patterns

The filter accepts tickets that have the same pattern of number movement as any of the selected past winning numbers draws. The movement pattern of filtered tickets is calculated by comparing its numbers with the latest winning numbers of selected draws.

Example

The latest three draws in Expert Lotto 6/49 Demo lottery are:

Draw							Number Movement Pattern
2010/28 Sun 2nd	23	29	36	42	44	47	[07]	++++++
2010/28 Sun 1st	06	13	14	19	41	42	[29]	+=-+++
2010/28 Wed 2nd	02	13	16	17	25	40	[27]	-----+

When filter settings are *Winning Numbers: 3 latest draws* then filter accepts for example ticket 1-2-3-4-5-48. When compared with the latest draw *2010/28 Sun 2nd* its last number movement pattern is -----+ which does match one of the selected draws (*2010/28 Wed 2nd*). The filter also accepts for example ticket 24-30-37-43-45-48. All its numbers are greater than numbers in draw *2010/28 Sun 2nd* so its movement pattern is ++++++ which matches selected draw *2010/28 Sun 2nd*.

Filter rejects for example ticket 22-28-35-41-43-46 because its movement pattern is ------ (comparing with the latest selected draw *2010/28 Sun 2nd*) which does not match the pattern of any of the selected past draws.

When filter settings are *Winning Numbers: 1 latest draw,* then filter accepts only tickets that have all their numbers greater than numbers in draw *2010/28 Sun 2nd*. For example ticket 24-30-37-43-45-48.

See also Number Movement Patterns statistics.

Number Distance

This filter compares ticket numbers at selected neighboring positions and selects tickets where the difference between such numbers is within selected interval.

Example

When filter settings are *Positions 3-2, Min distance 1, Max distance 1, At least 1 to 1 positions must pass* then filter will select tickets where number at the third position is one higher than the number at the second position, for example 5-22-23-27-28-49 or 13-15-16-20-26-35

When filter settings are *Positions 1-0, Min distance 1, Max distance 10, At least 1 to 1 positions must pass* then filter will select tickets where the first number is from the range 1 to 10.

See also Neighbors Distance filter.

Digits Patterns

The filter accepts tickets that have the same first/last digits as any of selected past winning numbers draws. The *first digit* is the leading digit of the number, the *last digit* is the second digit of the number. For example the first digit of number 23 is 2, the last digit of that number is 3. The first digit of number 9 is 0, the last digit of that number is 9.

Example

The latest three draws in Expert Lotto 6/49 Demo lottery are:

2010/28 Sun 2nd	23	29	36	42	44	47	[07]
2010/28 Sun 1st	06	13	14	19	41	42	[29]
2010/28 Wed 2nd	02	13	16	17	25	40	[27]

When filter settings are *Winning Numbers: 3 latest draw, Last Digits, At least 6 to 6 positions must pass* then filter accepts for example ticket 12-13-16-17-25-30. Its last digits are 2-3-6-7-5-0 so there is a match with selected draw *2010/28 Wed 2nd*.
Filter rejects for example ticket 12-13-16-17-25-31 because only five last digits are the same as in draw *2010/28 Wed 2nd* and there is no match with any other selected draw.

When filter settings are *Winning Numbers: 3 latest draw, Last Digits, At least 3 to 3 positions must pass* then filter accepts for example ticket 12-13-16-17-21-22. Its three numbers 13, 21 and 22 have the same last digits as numbers of draw *2010/28 Sun 1st*. So the ticket is accepted even though it has four matching last digits when compared with draw *2010/28 Wed 2nd*.
Filter rejects for example ticket 12-13-16-17-25-30 because all six last digits are the same as in draw *2010/28 Wed 2nd* and there is no match in three digits with any other selected draw.

Digits Movement Patterns

The filter accepts tickets that have the same pattern of movement of first/last digits as any of the selected past winning numbers draws. The movement pattern of filtered tickets is calculated by comparing its digits with the digits of the latest selected draw.

Example

The latest three draws in Expert Lotto 6/49 Demo lottery are:

Draw								First Digit Pattern	Last Digit Pattern
2010/28 Sun 2nd	23	29	36	42	44	47	[07]	++++==	-++-++
2010/28 Sun 1st	06	13	14	19	41	42	[29]	====+=	+=-+-+
2010/28 Wed 2nd	02	13	16	17	25	40	[27]	-=--=+	--++--

When filter settings are *Winning Numbers: 3 latest draws, Last digits* then filter accepts for example ticket 1-2-7-8-10-11. When compared with the latest draw *2010/28 Sun 2nd* its last digit movement pattern is --++-- which does match one of the selected draws (*2010/28 Wed 2nd*). The filter also accepts for example ticket 28-29-35-39-43-49. When compared with the latest draw *2010/28 Sun 2nd* its last digit movement pattern is +=-+-+ which matches selected draw *2010/28 Sun 1st*.

Filter rejects for example ticket 1-2-3-4-5-6 because the pattern of last digits is ---++- (comparing with the latest selected draw *2010/28 Sun 2nd*) which does not match the pattern of any of the selected past draws.

When filter settings are *Winning Numbers: 3 latest draws, First digits* then filter rejects all tickets. Looking at the table above we can see that in all three selected past draws the movement pattern mandates one first digit greater than 4. However that is not possible in a x/49 lottery.

When filter settings are *Winning Numbers: 1 latest draw, Last digits* then filter rejects all tickets. The last digit at the second ticket position is 9 and the movement pattern requires greater last digit at that position. However there is no last digit greater than 9.

See also Digits Movement Patterns statistics.

Number Groups Patterns

The filter accepts tickets that have the same pattern of distribution of numbers into selected *number groups* as any of the selected past winning numbers draws.

Example

The latest three draws in Expert Lotto 6/49 Demo lottery are:

Draw							Number Groups Distribution
2010/28 Sun 2nd	23	29	36	42	44	47	[07]	0-0-2-1-3
2010/28 Sun 1st	06	13	14	19	41	42	[29]	1-3-0-0-2
2010/28 Wed 2nd	02	13	16	17	25	40	[27]	1-3-1-1-0

Note: The table above shows the patterns for the default range numbers groups 1-10, 11-20, 21-30, 31-40, 41-49.

When filter settings are *Winning Numbers: 3 latest draws, Number Groups: Default* then filter accepts for example ticket 1-11-12-13-21-31. The distribution of its numbers into the default number groups is 1-3-1-1-0 which does match one of the selected draws (*2010/28 Wed 2nd*). The filter also accepts for example ticket 23-26-37-42-44-46. Its number groups distribution is 0-0-2-1-3 which matches selected draw *2010/28 Sun 2nd*. Another accepted ticket is for example 6-13-14-19-41-42. It has the same numbers as one of the selected draws (*2010/28 Sun 1st*) so it has also the same number groups distribution 1-3-0-0-2.

Filter rejects for example ticket 1-2-3-4-5-6 because its number groups distribution is 6-0-0-0-0-0 which does not match any of the selected past draws.

See also Number Groups statistics.

Draw Groups

The filter **rejects** tickets that have one ore more numbers from five groups of selected past draws.

Note: The filter requires at least 16 past winning numbers draws. If there are less draws selected in the filter window then the filter accepts all tickets.

Example

The latest 16 draws in Expert Lotto 6/49 Demo lottery are:

2010/28 Sun 2nd	23	29	36	42	44	47	[07]	
2010/28 Sun 1st	06	13	14	19	41	42	[29]	**Group A**
2010/28 Wed 2nd	02	13	16	17	25	40	[27]	
2010/28 Wed 1st	16	18	22	23	28	29	[24]	
2010/27 Sun 2nd	01	06	12	24	32	41	[44]	**Group B**
2010/27 Sun 1st	02	15	22	29	30	37	[42]	
2010/27 Wed 2nd	20	23	25	30	33	35	[07]	
2010/27 Wed 1st	08	11	19	26	48	49	[18]	**Group C**
2010/26 Sun 2nd	08	11	18	32	36	38	[06]	
2010/26 Sun 1st	05	06	11	31	40	43	[32]	
2010/26 Wed 2nd	04	18	26	33	35	47	[11]	
2010/26 Wed 1st	05	12	25	31	44	46	[33]	Group D
2010/25 Sun 2nd	10	15	28	30	36	43	[35]	
2010/25 Sun 1st	16	21	24	25	35	46	[47]	
2010/25 Wed 2nd	09	12	23	34	39	49	[24]	**Group E**
2010/25 Wed 1st	01	06	22	24	34	40	[33]	

The filter **rejects** ticket if it contains any number which is listed in groups B or E and which at the same time is not listed in groups A or C.

Winning numbers in groups A and C are: 2,5,6,7,8,11,13,14,16,17,18,19,20,23,25,26,27,29,30,31,32,33,35,36,38,40,41,42,43,44,47,48,49

Winning numbers in groups B and E are: 1,2,6,9,12,15,16,18,21,22,23,24,25,28,29,30,32,33,34,35,37,39,40,41,42,44,46,47,49

Numbers listed in groups B and E and not listed in groups A and C are: 1,9,12,15,21,22,24,28,34,37,39,46. So the filter **rejects** all tickets that contain one or more of these numbers.

For example filter accepts ticket 2-3-4-5-6-7 or 8-13-32-36-48-49. The filter rejects for example ticket 1-2-3-4-5-6 because its number 1 is listed in the group above. Also ticket 8-13-34-39-48-49 because its numbers 34 and 39 are listed in the group above.

Ranges Patterns

This filter accepts tickets that have the same distribution of numbers into ranges of the latest draw as any of selected past draws.

Winning numbers of each draw divide the number pool into six consecutive ranges (applies to 6/xx lottery). If the latest winning numbers are for example 23-29-36-42-44-47 then the ranges they define are: 1 to **23**, 24 to **29**, 30 to **36**, 37 to **42**, 43 to **44** and 45 to 49.

For example ticket 15-25-31-33-41-49 then has the following distribution pattern: XXX--X. Its first number 15 fits into the first range (1 to 23) so the first part of the pattern is X. Second number 25 also fits into the second range (24 to 29) so the pattern continues with X. Number 31 is in the third range so the pattern has X at the third position. Numbers 31 and 41 do not fit into ranges at appropriate positions so the pattern shows - at fourth and fifth positions. The last number 49 fits into the last range so the last part of the distribution pattern is X.

Note: The first range always starts with the lowest pool number. The last number range always ends with the highest pool number.

Example

The latest five draws in Expert Lotto 6/49 and their distribution patterns are:

2010/28 Sun 2nd, 23-29-36-42-44-47-[07] -----X
2010/28 Sun 1st, 06-13-14-19-41-42-[29] -XX--X
2010/28 Wed 2nd, 02-13-16-17-25-40-[27] X---XX
2010/28 Wed 1st, 16-18-22-23-28-29-[24] ---XX-
2010/27 Sun 2nd, 01-06-12-24-32-41-[44] XX-X-X

When filter settings are *Winning Numbers: 5 latest draws* then:

- 01-02-03-04-43-45 - filter accepts this ticket because its range distribution pattern is X---XX (when compared with the latest of the selected draws *2010/28 Sun 2nd*) which matches the pattern of selected draw *2010/28 Wed 2nd*.

- 26-29-31-33-37-46 - filter accepts this ticket because its range distribution pattern is -XX--X (comparing with the ranges of the latest draw *2010/28 Sun 2nd*) which matches selected draw *2010/28 Sun 1st*.

- 01-02-03-04-05-06 - filter rejects this ticket because its distribution pattern is X----- and it doesn't match any of selected past draws.

See also Winning Numbers Ranges statistics.

Mutual Match

This filter opens from menu *Package - Reduce - Mutual Match*. The filter compares all tickets in the Package with each other. If there are for example 10 tickets in the Package then the first ticket will be compared with tickets 2 to 10, the second ticket will be compared with tickets 3 to 10, the third ticket will be compared with tickets 4 to 10 etc.

Example

Let's assume the Package contains the following tickets:

01-02-03-04-05-06
01-02-03-08-09-10
01-02-03-31-32-33
01-22-23-24-25-16
01-22-23-24-25-26

- Filtering with settings *Match 3* will leave only two tickets in the Package - the first one (01-02-03-04-05-06) as it matches the following two tickets in three numbers 1, 2 and 3 and the second one as it matches the following ticket in the same three numbers.
- Filtering with settings *Match 3, Min 2* will leave only the first ticket in the Package as it matches two other tickets in the Package in three numbers.
- Filtering with settings *Match 3, Max 1* will leave only the second ticket in the Package as it matches one other Package ticket in three numbers.

Package Optimizer

This filter removes surplus tickets from the Package while maintaining the selected win guarantee. The filter opens from menu *Package - Reduce - Optimize Coverage*. You can use the filter either to create *optimized wheels* or to filter the result of your lottery strategy to *reduce the cost* of your bet.

Wheels

Wheels with a win guarantee are usually described as "x if y (n)". Where "x" is the lowest guaranteed match when "y" winning numbers are drawn from "n" numbers the wheel is created from. For example wheel "3 if 6 (20)" guarantees at least one *match 3* prize when any 6 numbers out of pool's 20 numbers hit in the next draw. The smallest possible wheel with such win guarantee contains ten tickets. It means you must bet at least 10 tickets if you want to win at least one match 3 prize. All six winning numbers must come from the twenty numbers the wheel is combined from.

Example

Use the following steps to create an optimized wheel from 20 numbers with 3 if 6 win guarantee in Expert Lotto 6/49 Demo lottery:

1. Use menu *Package - Insert - Full Wheel*.
2. In [Full Wheel](#) window select *Create all combinations of 6 numbers from a pool of 20 numbers. Interval: 1*
3. Click button *Insert* to insert the full wheel into the Package. The Package will contain 38,760 tickets.
4. Use menu *Package - Reduce - Optimize Coverage* to open this filter window.
5. Select *I want to have 100% guarantee of matching at least 3 winning numbers when I hit any 6 numbers. Algorithm preference: smaller resulting wheel*
6. Click button *OK* to start the filter. The filter window will close and you can track the filter progress at the lower right corner of the main window.
7. The filtering may take several minutes to finish, depending on how fast your computer is and how many execution cores your CPU has.
8. When the filter is finished, you will see the filtered tickets in the Package. There will be approximately 14 tickets left.
9. Use menu *Package - Coverage* to calculate the win guarantee of the optimized wheel.
10. Select *Show my winnings when I hit 6 numbers* and click button *Show*.
11. You will see that the lowest possible win is one *Match 3* prize.

Note that the resulting optimized wheel consists of 14 tickets while the smallest possible wheel for the same win guarantee needs just 10 tickets. The algorithm this filter implements will never produce wheels that match highly optimized and tightly woven wheels you can find on internet. The main purpose of this filter is the coverage optimization of tickets resulting from your lottery strategy, not creation of optimized wheels from scratch.

If you are on a tight budget, you can create even smaller optimized wheels:

1. Repeat steps 1 to 4 above.
2. Select *I want to have **95%** guarantee of matching at least 3 winning numbers when I hit any 6 numbers. Algorithm preference: smaller resulting wheel*
3. Click button *OK* to start the filter. The filter window will close and you can track the filter progress at the lower right corner of the main window.
4. The filtering may take several minutes to finish, depending on how fast your computer is and how many execution cores your CPU has.
5. When the filter is finished, you will see the filtered tickets in the Package. There will be approximately 8 tickets left.
6. Use menu *Package - Coverage* to calculate the win guarantee of the optimized wheel.
7. Select *Show my winnings when I hit 6 numbers* and click button *Show*.
8. You will see that there is about 4% chance of winning nothing. That means the wheel guarantees win with a chance of 96%.

In the steps above we lowered the required win guarantee from 100% to 95% and the resulting wheel consists of 8 tickets only. That is reduction by 42%. So while still having very high chance (95%) of winning at least one match 3 prize we managed to lower the wheel size significantly and thus saved a lot of money.

▶ Keep in mind that lowering the required win guarantee by a few percent or just a fraction of percent can decrease the size of optimized wheel by tens or hundreds of tickets.

Optimize Coverage

If you have just finished applying all the filters according to your lottery strategy and the resulting set of tickets is too large for your betting budget, then there are two options. Either continue filtering with the risk of making an error in your estimates and filtering out the winning tickets. Or use *Package Optimizer* or [Best Tickets](#) filters to reduce the count of tickets and aim for lower tier prizes.

Example

Let's use the following simple (and not very effective) lottery strategy in Expert Lotto 6/49 Demo lottery:

1. Start with the full wheel of all possible combinations: menu *Package - Insert - Full Wheel*, select *Create all combinations of 6 numbers from a pool of 49*.
2. Use Odd/Even filter to keep only tickets with the most frequent ratio of 3:3. There will be 4,655,200 tickets left.
3. Use Low/High filter to keep only tickets with the most frequent ratio of 3:3. There will be 1,532,168 tickets left.
4. Use Sum Range filter to keep only tickets with the most frequent sum values 153 to 173. There will be 543,748 tickets left.

From statistical point of view these tickets have very high chance of winning. However so many tickets are way over any betting budget. So we will use *Package Optimizer* filter to go after lower tier prizes. The Package contains over half a million tickets that the filter must iterate over many times so we need to increase the filtering speed by optimizing the coverage for selected numbers only.

1. Use menu *Tools - Options - Number Coloring* to display number coloring settings.
2. Switch to *Hot/Cold* tab and select *Scan for hot/cold numbers in 30 latest draws, Maximum frequency of cold numbers: 2, Minimum frequency of hot numbers: 5*
3. Toggle button ⚏ in the main toolbar and select *Hot/Cold* in the combo box listing all available number colorings.
4. Use menu *Package - Reduce - Optimize Coverage* and adjust filter settings as on the screenshot below

5. Click button OK to start filtering.

When the filtering is finished (it will take a while), there will be about 29 tickets left. Those tickets meet all the conditions of our lottery strategy above (odd/even, low/high, sum range) and have 95% chance of winning at least one *Match 3* prize if the next winning numbers consist entirely from hot or cold numbers.

To verify the win guarantee, open *Package Optimizer* filter window again. Select the same set of numbers on the ticket panel (see the picture above) and click button *Show Coverage*. Then choose *Show my winnings when I hit 6 numbers* and click button *Show*.

Package Optimizer filter is capable of reducing the ticket count by several orders of magnitude while maintaining the required win guarantee.

Filter Settings

Use the edit fields to define the required win guarantee. For example win guarantee *4 if 5* is expressed as *I want to have 100% guarantee of matching at least 4 numbers when I hit any 5 numbers*. It means you are guaranteed to win at least one *Match 4* prize if the winning numbers include at least 5 numbers of your wheel.

It is possible to significantly reduce the count of filtered tickets (and increase filtering speed) by reducing the probability of winning the required price. For example reducing the chance from 100% to e.g. 98% or 95% still gives very high chance of winning but it will also reduce the size of resulting wheel.

Option *Algorithm preference* affects filter performance. When *smaller resulting wheel* is selected, the filter will take more time to finish however the resulting optimized wheel will be smaller and more compact. With option *shorter filtering time* the filter will perform faster but the resulting wheel will need more tickets to meet the required win guarantee.

The ticket panel on the right of the filter window shows all the numbers in the Package. If a number is not present than its box has gray background and cannot be ticket using mouse.

It is possible to optimize coverage for a smaller set of numbers only. Simply use your mouse to tick/untick numbers on the ticket panel. For example you can tick only numbers that the most/least frequent in several past draws, numbers that did (not) hit for a long time etc. Number coloring highlights numbers selected in statistical tables.

Show Current Coverage button calculates and shows the win coverage of tickets in the Package. Menu *Package - Coverage* also shows the win coverage of the tickets in the Package. However the coverage is calculated for the whole number pool, i.e. all 49 numbers in a x/49 lottery. The coverage calculator started from *Package Optimizer* window shows the coverage only for numbers selected on the ticket panel in the filter window. So you can see the win guarantee when you expect that the winning numbers will be drawn from a smaller set of numbers.

▶ The filtering time increases exponentially with the size of the number pool - optimizing the coverage of only 15 numbers will be fast, however optimizing the coverage of the whole 49 number pool will take hours. If possible, untick some numbers on the ticket panel in the filter window.

▶ The filter runs much faster on modern multi-core CPUs. Check the number of execution cores your CPU has, then click menu *Tools - Options - Miscellaneous - Execution* and enter the number of cores into *Number of threads for long running tasks* field.

▶ You can watch the filter progress at the lower right corner of the main window. Click the progress bar to see additional info about the current size of the wheel and the current coverage percentage. You can stop the filter if the coverage is high enough (e.g. 90% or 95%).

▶ Always check the current coverage before applying this filter. If the win guarantee of the tickets in the Package is e.g. 92% before using this filter then it doesn't make sense to require 100% win guarantee.

See also Best Tickets filter.

Best Tickets

This filter finds the *best* or *worst* tickets in the Package. The filter opens from menu *Package - Reduce - Best Tickets*.

- *Best ticket* matches most of other tickets in the Package. The more numbers it matches in other Package tickets the better the ticket is. So filtering for the *best tickets* selects tickets with numbers that appear in most of other tickets in the Package. It maximizes lower division prize winnings while reducing the cost of the bet.
- *Worst ticket* has very little matches with other tickets in the Package. The less numbers it matches in other Package tickets the worse the ticket is. Filtering for the worst tickets selects tickets with numbers that are not very frequent in other Package tickets.

▶ Use this filter as the last step of your lottery strategy when the amount of tickets left in the Package is still too large for your betting budget.

See also Package Optimizer filter.

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Random Selection

This ticket filter accepts or reject randomly selected tickets in the Package. The filter opens from menu *Package - Reduce - Random Selection*.

You can use this filter as the last step of your lottery strategy when the amount of tickets left in the Package is too large for your betting budget. You can consider this filter as optimized 'quick pick' as it will select a few tickets at random. But the tickets in the Package already passed all your lottery strategy filters so you should have much larger chance of winning than choosing a totally random quick pick at lottery agent's shop. An alternate filter is Systematic Selection or Best Tickets filter.

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Systematic Selection

This ticket filter accepts or reject every *N-th* ticket in the Package. The filter opens from menu *Package - Reduce - Systematic Selection*.

Example

Let's assume the Package contains the following tickets:

01-02-03-04-05-06
01-02-03-04-05-07
01-02-03-04-05-08
01-02-03-04-05-09
01-02-03-04-05-10
01-02-03-04-05-11
01-02-03-04-05-12
01-02-03-04-05-13
01-02-03-04-05-14
01-02-03-04-05-15

Then after filtering with settings *Accept every 4th ticket* the Package will contains only the following tickets:

01-02-03-04-05-09
01-02-03-04-05-13

Complex Filter

Complex Filter groups several simple filters together so that they can be applied in a single step. *Complex Filters* also allow combining of simple filters together using *AND/OR* logical operators. *Complex Filters* can be saved to a file on your disk and reopened on next application startup.

To create a new *Complex Filter*, click menu *File - New - Complex Filter*. To open an existing *Complex Filter* click menu *File - Open File* and select *Filter Files* in *Files of type* combo box at the bottom of file browser window that opens from that menu command.

▷ You can also drag and drop a complex filter file into the main application window to open that filter. Complex Filter files have *.filter* extension.

You can reuse *Complex Filters* in various lotteries installed on your computer. The following rules apply:

- If *lottery A* has the same number pool(s), the same count of numbers in each ticket and the same draw schedule as *lottery B* then *Complex Filters* created for *lottery A* can be opened, applied and modified in *lottery B* without any restrictions.

- If *lottery A* has the same draw schedule, the same count of numbers in each ticket and all number pools are the same or bigger than in *lottery B* then *Complex Filters* created for *lottery A* can be opened and applied in *lottery B*. However the filter will open as read-only in *lottery B* you cannot modify its settings. For example when playing a 6/40 lottery then it is possible to open and apply a filter created for 6/49 lottery.

- Expert Lotto will refuse to open a *Complex Filter* if the lottery it was originally created for is not compatible with the current lottery - because it has a different count of main or bonus numbers, it has a different draw schedule or its number pool is bigger than the original lottery. For example *Complex Filter* created for *Jackpot* lottery won't open in *Pick 3* lottery and vice versa.

Complex Filter window has four different modes. You can switch between the modes by clicking at appropriate buttons at the top of the *Complex Filter* window.

- [Design](#) - in this mode you can add/remove simple filters, modify filter settings and preview filter results.
- [Run](#) mode allows applying the filter on tickets in the Package or on other ticket sources.
- [Back-test](#) mode applies the filter on selected past winning numbers to see how many past draws would have been accepted or rejected by the complex filter.
- [Performance](#) mode evaluates filter's efficiency by comparing filter results witch actual past winning numbers.

Design

In *Design* mode you construct and customize your complex filter. The *Design* screen is divided into three parts. At the top there is *Name & Description* pane where you can enter the name and a short description of your complex filter. The pane is collapsible by clicking on its header. The middle part of the *Design* screen is the actual filter hierarchy. At the bottom of the screen there is collapsible *Preview* pane.

▶ You can collapse *Name & Description* and *Preview* panes to maximize the screen area available for the filter tree.

▶ You can change the layout of split windows using menu *View - Split orientation*.

Creating Complex Filter

When creating a new *Complex Filter* its filter hierarchy is initially empty. To add a new filter to your complex filter, click button *Add filter* at the top-right corner of *Complex Filter* window. This opens [Select Filter](#) window listing all available filters. Select the filter you wish to add and click *Select* button. The filter is added to the complex filter hierarchy and its settings are available at the lower part of filter hierarchy area. Repeat the same steps to add another filter to the complex filter.

Another way of adding a filter is using [Filters](#) window - simply drag the desired filter from *Filters* window and drop it into the *Complex Filter* window. Note that there's a visual hint when dragging a filter over complex filter hierarchy indicating where the filter can be dropped.

If you have other Complex Filters stored on your disk you can drag them from e.g. Windows Explorer window and drop them into *Design* tab. Dropped filters will be added as [references](#). It is even possible to drag and drop a folder with Complex Filters. Each folder and sub-folder will be added as a [group](#) of filter references.

To customize the settings of any filter in the hierarchy, click the filter in the table first. The lower part of the *Designer* window will then show controls for the modification of the settings of the selected filter. Note that filter's description updates automatically in the *Description* column as you make changes to filter's settings.

▶ You can drag the divider between filters table and filter settings area to enlarge the upper or the lower part of the *Designer* window as needed.

If you wish to remove a filter from complex filter hierarchy select the filter using your mouse then press *Delete* key. You can also use menu *Edit - Delete* or right-click the filter in the list and select *Remove* from its popup menu.

Note: Removing a *Filter Group* ([see below](#)) also removes all filters belonging into that group.

The complex filter hierarchy is shown as a table with several columns:

- **Filters** - shows filter name and its position within the hierarchy.
- **Matching Tickets** - shows whether the filter accepts the matching tickets or rejects them. Click the filter row and use toggle buttons in filter settings pane to change the value in this column.
- **Description** - provides brief description of filter settings. Click the filter row and customize the filter settings in the lower pane to change the value in this column.
- **Accepted** - shows the count of tickets accepted by this filter when running filter [preview](#).

- **Rejected** - shows the count of tickets rejected by this filter when running filter [preview](.).
- **Rejected Draws** - shows the count draws that failed filter condition when back-testing it on past winning numbers draws. Clicking the button within this field opens a window listing all the rejected draws.
- **Enabled ?** - shows if the filter on the given row is enabled or disabled.
- **Notes** - contains your notes about the filter in the given table row.

Clicking a table column sorts the table in ascending or descending order which makes it easier to find a particular filter in a deep complex filter hierarchy. Table columns are resizable by dragging their border.

You can reorganize the filters within complex filter hierarchy using mouse drag and drop. It is also possible to copy selected filter(s) using Ctrl+C keyboard shortcut and paste them as copy to a different place in filter hierarchy using Ctrl+V shortcut.

It is strongly recommended to place the more expensive filters to the bottom of each filter group to increase the filtering speed. For example a filter checking the sum of ticket numbers is very fast and doesn't consume that many computational resources. However a filter which compares each ticket with other tickets in a file is very expensive and much more CPU time is needed for its execution. So if complex filter rejects a ticket because its sum is outside allowed range then there is no point comparing that with other tickets from a file and the whole complex filter is executed much faster.

Right-click any filter or any filter group in the hierarchy to open its popup menu. You can use it to *preview*, *run*, *back-test*, or *analyze performance* of the selected filter instead of the whole complex filter hierarchy. Select *Disable* from the popup menu to turn the filter off. Disabled filters, displayed using strike-through font, are not applied when the complex filter is being executed. Select *Enable* from disabled filter's popup menu to turn that filter on again. This way you can fine-tune your complex filter

▶ You can select multiple items in the filter hierarchy and right-click them to get the following choices in popup menu:

- *Select Draws* - changes the selection of past draws for all selected filters. This option is available only when at least one of the selected filters has an option to select past draws for its input settings.
- *Matching Ticket - Accept/Reject* - invert the condition of selected filters.
- *Segmentation Settings* - adjusts [Segmentation settings](.) for selected History filters. This option is available only when at least one of the selected filters requires Segmentation input.
- *Expand* - expands selected filter groups.
- *Collapse* - collapses selected filter groups.
- *Enable* - enables all selected filters.
- *Disable* - disables all selected filters.
- *Remove* - removes all selected filters.
- *Cut* - removes selected filters from the hierarchy and puts them into system clipboard. Then you can paste the filters to a different place in filter hierarchy.
- *Copy* - puts copy of selected filters into system clipboard.
- *Paste* - places filters from system clipboard (if any) into selected row in the filter hierarchy.

Note: When the filter is being executed in a *Preview* pane or *Run* mode you can still make changes to the complex filter however those changes are not propagated to the already running filter. You must execute the filter again to have the changes reflected in the filtered tickets.

Note: Red color in *Filters* column denotes filters that failed one or more draws in a back-test.

Filter Groups

Filters at the same level of complex filter hierarchy are organized into filter groups. A filter group is basically a filter condition applied to tickets being filtered - filter group accepts a ticket if sub-filters within the group accept the ticket. By default the filter group condition is that all filters within the group must accept the ticket. However it's possible to customize the count of filters required to pass which allows various logical operators to be applied on filters within the group.

For example let's assume that a filter groups has sub-filters called *A, B* and *C*:

- By default all sub-filters must pass so the filter group accepts a ticket only if *filter A* accepts that ticket **AND** *filter B* accepts that ticket **AND** *filter C* accepts that ticket.
- Adjusting filter group settings to *Minimum count of filters to pass = 1* makes the group to accept a ticket if *filter A* accepts that ticket **OR** *filter B* accepts that ticket **OR** *filter C* accepts that ticket.
- Adjusting filter group settings to *Minimum count of filters to pass = 1* and *Maximum count of filter to pass = 1* makes the group to accept a ticket only if just one of the filters *A, B* or *C* accept the filter. If two or all three filters accept a ticket then the filter group rejects such a ticket.

All of the above can be combined with *Matching Tickets: Accept/Reject* option for group filters, which is the equivalent of logical operator **NOT**. Filter groups can contain other filter groups so it's possible to build very rich logical constructs that should fit any filtering needs.

Each complex filter has at least one filter group which is the root of the complex filter hierarchy. To add another filter group click *Add group* button at the top-right corner of the designer window. To add a filter to a group, first select the group in the table then click *Add filter* button or simply drag a filter from *Filters* window and drop it to the filter group row in the table. The dropped filter will be added to the end of filter list within that group. You can also move filters between the groups using mouse drag and drop. Select the filter group in a table to adjust its settings in the lower pane.

Filter Preview

Filter preview shows how many tickets the filter accepts and rejects. It should be used frequently when designing a complex filter to ensure that the selected filter settings are correct and that no filter in the hierarchy rejects all filtered tickets.

To preview the complex filter, first expand the *Preview* pane at the bottom of the designer screen by clicking its header. Then click *Select* button to open popup menu to choose the tickets the filter will be applied to:

- **Package** - applies the filter to the tickets in the Package. This option is available only when the Package isn't empty.
- **Ticket File** - applies the filter to the tickets from a selected file. Clicking this option opens file browser window where you can select the ticket file to be used for filter preview.
- **Random Numbers** - applies the filter to the selected combinations of random numbers.
- **Full Wheel** - applies the filter to all possible combinations created from the pool of selected numbers.

Then click button *Preview* to execute the filter on the selected tickets. While the filter is running you can see a progress bar in the *Preview* pane and at the bottom right corner of the main application window where you can abort the filter preview. The count of tickets accepted/rejected so far is available in the *Preview* pane. Also the filters table shows the count of tickets accepted/rejected by individual filters. Use the ticket counts in *Accepted* and *Rejected* columns to identify possible problems in your filter hierarchy - for example filter accepting all or too many tickets or a filter rejecting all tickets.

You can also preview an individual filter in the complex filter hierarchy or an individual filter group with all its sub-filters. To do so, right-click the filter or the filter group in the table and choose *Preview* from its popup menu. Alternatively make sure the filter/filter group is selected in the table and then click the little down arrow on *Preview* button. It opens a popup menu where you can choose whether the whole complex filter is to be previewed or just the selected filter/filter group. The name of the filter being previewed is shown at the top of the *Preview* pane.

Run

Click *Run* button at the top of *Complex Filter* window to switch to *Run* mode where you can apply the complex filter on selected tickets and see a table of tickets the filter accepted. First click *Select* button to choose the tickets to be filtered. The options are the same as described in [Filter Preview](#) section above. Select option *Matching Tickets: Accept* if you wish to see tickets accepted by the filter or click button *Reject* if you wish to obtain tickets rejected by the filter. Then click *Run* button to execute the filter. While the filter is running, you can see a progress bar at the top of *Complex Filter* window and also at the bottom right corner of the main application window where you can abort the filter execution. The filtered tickets will show in the table in the middle of the *Complex Filter* window.

▶ Click any filtered ticket in the table to see its statistical properties in [Ticket Properties](#) window and its number layout in [Ticket Panel](#) window.

When the filtering is finished you can use toolbar at the bottom of the *Complex Filter* window to process the filtered tickets:

- **To Package** - overwrites the current Package contents with the filtered tickets. Click the little down-arrow icon on that button to *Append*, *Merge* or *Remove* the filtered from the Package.
- **To File** - stores the filtered tickets in a file. Clicking this button opens standard file browser window where you can choose the file name to stored the filtering results to.
- **Analyze** - opens [Tickets Analyzer](#) wizard to calculate various statistical tables and charts for the filtered tickets.

You can also execute an individual filter in the complex filter hierarchy or an individual filter group with all its sub-filters. To do so, right-click the filter or the filter group in the table and choose *Run* from its popup menu. Alternatively make sure the filter/filter group is selected in the table, switch to *Run* mode and then click the little down arrow on *Run* button. It opens a popup menu where you can choose whether the whole complex filter is to be executed or just the selected filter/filter group. The name of the filter being executed is shown at the top of the *Run* pane.

▶ Use menu *Edit - Find* to search for a ticket with given numbers in the list of filtered tickets.

Back-test

Back-testing a filter means that the filter condition is applied on past winning numbers to check that the filter accepts Jackpot winning tickets. Click *Back-test* button at the top of *Complex Filter* window to switch to *Back-test* mode, click *Select* button to choose past draws for back-testing and then click *Back-test* button. While the filter is running you can see a progress bar at the top of *Complex Filter* window and also at the bottom right corner of the main application window where you can abort the filter execution. The filtered draws will show in the table in the middle of the *Complex Filter* window. Draws rejected by the filter are displayed in strike-through font. You can also see the count of draws accepted by the filter and the count of draws the filter rejected at the top of the *Complex Filter* window.

The last two columns in the *Back-test* results table show the name and the description of the filter that rejected the given draw. You can double-click the row with reject draw to switch to *Design* tab and have the filter node selected. This way you can quickly fine-tune your *Complex Filters*.

▶ Click any draw in the table to see its statistical properties in [Ticket Properties](#) window and its number layout in [Ticket Panel](#) window.

When the filtering is finished you can use toolbar at the bottom of the *Complex Filter* window:

- **Show accepted draws only** - hides/shows rejected draws in the table.
- **Analyze** - opens [Tickets Analyzer](#) wizard to calculate various statistical tables and charts for the all draws in the table

You can also back-test an individual filter in the complex filter hierarchy or an individual filter group with all its sub-filters. To do so, right-click the filter or the filter group in the table and choose *Back-test* from its popup menu. Alternatively make sure the filter/filter group is selected in the table, switch to *Back-test* mode and then click the little down arrow on *Back-test* button. It opens a popup menu where you can choose whether the whole complex filter is to be back-tested or just the selected filter/filter group. The name of the filter being back-tested is shown at the top of the *Back-test* pane.

Note: Even when a filter rejects all past draws then it doesn't necessarily mean that it's a bad filter. The filter may not yield Jackpot winning numbers but it can still be profitable by generating a lot of lower-division prizes.

Note: When a filter is being back-tested you cannot make any changes to the complex filter hierarchy. When the filter is finished then the editing of filter settings is enabled again.

▶ Use menu *Edit - Find* to search for a draw with given numbers.

If you play a lottery that draws one or more bonus numbers from the same pool as the main numbers you can tick option *Merge bonus to main numbers* in [Draw Selection](#) window. That option changes the behavior of filters that compare the filtered ticket/draw with past winning numbers draws, it does not affect in any way filters that do not use past winning numbers to accept/reject filtered tickets.

For example in *Expert Lotto 6/49* demo lottery the latest winning numbers are 23-29-36-42-44-47 and bonus number 7. The previous winning numbers are 6-13-14-19-41-42 and bonus number 29. If you back-test for example filter [Match Winning Numbers](#) with settings *Match 2, 1 latest draw* you will see that back-test rejects the latest draw *2010/28 Sun 2nd* because there's a match in a single number only (42) when compared with the previous draw *2010/28 Sun 1st*. However if you press *Select* button in *Back-test* tab and tick option *Merge bonus to main numbers* the latest draw will be accepted. It is because the latest draw *2010/28 Sun 2nd* with winning numbers 23-29-36-42-44-47 and bonus number 7 is actually compared with merged draw *2010/28 Sun 1st* that has seven main numbers 6-13-14-19-29-41-42. And there is a match in two numbers (29 and 42).

Performance

Filter performance shows how many actual winning numbers can be found in the best ranked numbers in filtered tickets:

1. Filter is applied on selected tickets, for example tickets in the Package or full wheel of all possible combinations.
2. Pool numbers are sorted into ranks according to their occurrence in the tickets accepted by the filter. The most frequent number(s) is in the first rank, less frequent numbers are in lower ranks. Please note that numbers with the same occurrence are placed into the same rank.
3. Actual winning numbers from a given draw are compared with number occurrence ranks. The more winning numbers in the highest ranks, the better the filter performance is.
4. The steps above are repeated for another past winning numbers draw.

Example

The picture below shows the performance results for [Match Winning Numbers](#) filter in the demo Expert Lotto 6/49 lottery. This filter accepts only tickets that match any of the five latest draws in 3 or 2 numbers.

Tickets: 13,983,816 combinations of 6 numbers from a pool of 49 numbers. | Select ▶

Draws: 10 latest draws - Wed 1st, Wed 2nd, Sun 1st, Sun 2nd | Select...

Match Winning Numbers - 3, 2 (5 latest draws - Wed 1st, Wed 2nd, Sun 1st, Sun 2nd)

Calculate ▾

Results:

Draw	% Rejected	Accepted	$ Profit	Best 6	Best 10	Best 15
2010/26 Sun 1st	41.30	8,206,950	-3,405,530	6	6	
2010/26 Sun 2nd	43.40	7,913,816	-5,518,556	6	6	
2010/27 Wed 1st	43.27	7,931,687	-2,808,307	2	3	
2010/27 Wed 2nd	45.01	7,687,269	-2,914,819	3	6	
2010/27 Sun 1st	44.99	7,691,639	-6,590,239	1	6	
2010/27 Sun 2nd	42.12	8,093,100	-6,586,160	2	6	
2010/28 Wed 1st	41.40	8,194,175	-3,122,885	3	6	
2010/28 Wed 2nd	41.22	8,216,260	-6,413,670	6	6	
2010/28 Sun 1st	44.04	7,823,802	-3,027,972	3	6	
2010/28 Sun 2nd	44.40	7,771,931	-2,856,311	2	6	
Average	43.10	7,953,063	-4,324,445	3	6	

Number statistics:

Number	Occurrence		[%]
12	1389060	1	16.925
35	1389060		16.925
25	1342915	2	16.363
46	1342915		16.363
10	1173205		14.295
15	1173205	3	14.295
28	1173205		14.295
30	1173205		14.295
36	1173205		14.295
43	1173205		14.295
4	1155158		14.075
9	1155158		14.075
18	1155158	4	14.075
23	1155158		14.075
26	1155158		14.075
33	1155158		14.075
34	1155158		14.075
39	1155158		14.075
47	1155158		14.075
49	1155158		14.075
5	1120500		13.653
16	1120500		13.653
21	1120500	5	13.653
24	1120500		13.653
31	1120500		13.653
44	1120500		13.653
1	802780		9.782
2	802780		9.782
3	802780	6	9.782
6	802780		9.782

During the performance test the filter was applied to all 13,983,816 tickets in the Package - see the *Tickets* field. Because 10 latest draws are selected for performance testing - see the *Draws* field - the filter was actually executed 10 times - once for each of the selected draws.

Interpreting the results

The results table shows the dates of selected past draws. Column *Accepted* shows how many tickets the filter accepted in the given run. Column *% Rejected* shows the percentage of rejected tickets in each filter run. A well performing Complex Filter rejects a lot of tickets while still accepting the Jackpot one, or at least the tickets that yield a lot of lower level prizes.

Column *Profit* gives the total balance as if all tickets accepted by the filter were played for the given draw. Hovering mouse cursor above any cell in this column shows a tooltip with the total cost of such a bet and its total winnings. The values in the example above are based on the following payouts: Jackpot: $2,000,000, 2nd Prize: $100,000, 3rd Prize $1,000, 4th Prize $100, 5th Prize $5 and the cost of a single ticket is $1.

The following columns show the break-down of all winnings. The columns are labeled *Jackpot*, *2nd Prize*, *3rd Prize* etc (according to your lottery setup). The columns give the count of winning prizes found in each test run.

The rest of the table columns are labeled e.g. *Best 6, Best 10, Best 15* etc - depending on your lottery settings. These columns show how many winning numbers from the given draw fall into the best *6/10/15* number ranks. Click any draw date to see detailed number statistics for the given draw.

The last table column *Match Count* shows how many pool numbers were left after the given filtering run and how many winning numbers were found in that pool. For example value *5/37* means that tickets accepted in the filtering run consisted of 37 unique numbers and there were 5 winning numbers among those 37 numbers.

The picture above shows number statistics for draw *2010/26 Sun 1st*. The filter accepted *8,206,950* tickets in this performance test step and the most frequent numbers are: *12* and *35*. So the highest number rank consists of numbers 12 and 35. Numbers *25* and *46* are less frequent creating the second rank. The third rank includes numbers *10,15,28,30,36* and *43*. The whole number pool is divided into 6 ranks. The actual winning numbers for the selected draw are highlighted with black border. So winning number *43* falls into the third rank, winning numbers *5* and *31* fall into the fifth rank and the rest of the winning numbers fall into the lowest, sixth rank. Therefore the results table shows that 6 winning numbers fall into the 6 best numbers ranks in column *Best 6*.

Note: To achieve valid back-test results the winning numbers database automatically excluded draw *2010/26 Sun 1st* and all following draws to simulate the state that winning numbers for draw *2010/26 Sun 1st* haven't been drawn yet when testing the filter performance for this draw. The same applies when executing the filter for other selected draws.

The second picture shows number statistics for draw *2010/27 Wed 1st*:

Design	Run	Back-test	Performance

Tickets: 13,983,816 combinations of 6 numbers from a pool of 49 numbers. `Select ▶`

Draws: 10 latest draws - Wed 1st, Wed 2nd, Sun 1st, Sun 2nd `Select...`

Match Winning Numbers - 3, 2 (5 latest draws - Wed 1st, Wed 2nd, Sun 1st, Sun 2nd)

`Calculate ▾`

Results:

Draw	% Rejected	Accepted	$ Profit	Best 6	Best 10	Best 15
2010/26 Sun 1st	41.30	8,206,950	-3,405,530	6	6	
2010/26 Sun 2nd	43.40	7,913,816	-5,518,556	6	6	
2010/27 Wed 1st	43.27	7,931,687	-2,808,307	2	3	
2010/27 Wed 2nd	45.01	7,687,269	-2,914,819	3	6	
2010/27 Sun 1st	44.99	7,691,639	-6,590,239	1	6	
2010/27 Sun 2nd	42.12	8,093,100	-6,586,160	2	6	
2010/28 Wed 1st	41.40	8,194,175	-3,122,885	3	6	
2010/28 Wed 2nd	41.22	8,216,260	-6,413,670	6	6	
2010/28 Sun 1st	44.04	7,823,802	-3,027,972	3	6	
2010/28 Sun 2nd	44.40	7,771,931	-2,856,311	2	6	
Average	43.10	7,953,063	-4,324,445	3	6	

Number statistics:

Number	Occurrence		[%]
18	1371482	1	17.291
36	1360560	2	17.153
43	1349353	3	17.012
11	1333058	4	16.807
5	1329659	5	16.764
31	1329659		16.764
4	1136189		14.325
26	1136189	6	14.325
33	1136189		14.325
35	1136189		14.325
47	1136189		14.325
12	1125125		14.185
25	1125125		14.185
44	1125125	7	14.185
46	1125125		14.185
10	1117912		14.094
15	1117912		14.094
28	1117912	8	14.094
30	1117912		14.094
8	1094717		13.802
32	1094717	9	13.802
38	1094717		13.802
6	1078141	10	13.593
40	1078141		13.593
1	776913		9.795
2	776913	11	9.795
3	776913		9.795
7	776913		9.795
9	776913		9.795
13	776913		9.795

In this case the filter accepted *7,931,687* tickets and the best ranking number is *18*, the second ranking number is *36*, the third rank has only number *43* etc.

There are only two actual winning numbers in the best 6 ranks: number *11* in rank 4 and number *26* in the sixth rank. The best 10 ranks include three actual winning numbers: *11, 26* and number *8* in ninth rank.

On average this filter yields 3 winning numbers in the *best 6* ranks and even all 6 numbers in the *best 10/15* ranks - see the last *Average* row in the results table. It may seem as a very good result, however this filter generates only a few ranks for the whole number pool so naturally there's a bigger chance the winning numbers will fall into higher ranks. But if you manage to design a complex filter that on average yields e.g. four or more winning numbers in the first 15 ranks and there are not too many numbers in each rank then it might be a good idea to filter a full package with such a filter and then setup a wheel of the 15 most frequent numbers from the filtered package.

You can also calculate the performance of an individual filter in the complex filter hierarchy or an individual filter group with all its sub-filters. To do so, right-click the filter or the filter group in the table and choose *Performance* from its popup menu. Alternatively make sure the filter/filter group is selected in the table, switch to *Performance* mode and then click the little down arrow on *Calculate* button. It opens a popup menu where you can choose whether the whole complex filter is to be tested for performance or just the selected filter/filter group. The name of the filter being evaluated is shown at the top of the *Performance* pane.

Note: When a filter is being executed in *Performance* mode you cannot make any changes to the complex filter hierarchy. When the filter is finished then the editing of filter settings is enabled again.

Occurrences Filter

This filter does exactly the same job as [Analyzer Table Filter](#). The only differences is that you can add *Occurrences* filters into a [complex filter](#) to group them together.

Example

1. Click menu *File - New - Complex Filter* to create a new [complex filter](#).
2. Analyze 10 latest draws in Expert Lotto 6/49 Demo Lottery.
3. Display statistics of [Ticket Numbers](#).
4. Sort the table by *Occurrence* in descending order.
5. Highlight the first four rows using your mouse. They correspond to numbers *6, 11, 23, 29* which have been drawn three times in 10 latest draws.
6. Use menu *Edit - Copy*.
7. Switch back to the complex filter window and press menu *Edit - Paste*.
   It will create a new *Occurrences* filter node in the complex filter. Selet the Occurrences filter and choose *At least 2 to 3 in each ticket* in its customizer.
8. Return to the analyzer window and this time select the rows with zero occurrence. They correspond to numbers 3, 4, 7, 9, 10, 21, 27, 34, 39, 45, 46.
9. Use menu *Edit - Copy*.

10. Switch back to the complex filter window and press menu *Edit - Paste*.
It will create another *Occurrences* filter node in the complex filter. Selet the Occurrences filter and choose *At least 3 to 4 in each ticket* in its customizer.
11. Now you have a complex filter to find tickets that have 2 to 3 numbers that are the most frequent in the latest ten draws and also 3 to 4 numbers that haven't hit at all in the last ten draws.

Filter Builder

There is an optional plugin called *Automation* which among other features adds a possibility to analyze selected statitistics and automatically build complex filters consisting of *Occurrences* filters that match desired occurrence settings in analyzed statistics.

To install the *Automation* plugin click menu *Tools - Plugins*, switch to *Available Plugins* tab and tick *Automation* plugin listed there and click *Install* button. When the plugin installation is finished use menu *Tools - Automation - Build Filters - Occurrence*.

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Statistical Filter

This is a very powerful filter which accepts tickets that have selected statistical properties. Using this filter you can automate some mundane and repeating filtering tasks, e.g. as described here. Several *Statistical Filters* combined in a Complex Filter can provide a reliable filtering tool to obtain a starting set of tickets as an input for your lottery strategy.

The filter is based on statistical tables in Analyzer window. The filter first calculates the statistics of selected past draws and then accepts only tickets that have desired values in selected column(s) in statistical table.

Note: All examples below are given for *Expert Lotto 6/49 Demo Lottery*.

To use the filter, first click button *Select* to choose past winning numbers draws to calculate draw interval statistics from. In *Analyze* combo box select which statistical property the filter will evaluate. Then select desired statistical table column(s) in the table below and the required value or value range the accepted tickets must have. Click *Add* button to insert additional condition, click *Remove* button to drop the last condition in the list.
Option *Match all of the following* makes the filter accept only tickets that meet all the conditions listed in the table. Option *Match any of the following* makes the filter accept tickets that meet at least one of the listed conditions.
Some statistical properties selected in *Analyze* combo box add another filtering option: *Applies to X to Y in each ticket*. That is because when filtering e.g. according to statistics of ticket numbers then each accepted ticket can contain up to 6 numbers that the filter's statistical condition(s) pull from the whole number pool (in a 6/xx lottery).

Filter Conditions

The conditions in *Statistical Filter* look like this:

StatisticalTableColumnName Operator NumericalValue

Where the *StatisticalTableColumnName* is one of

- **Occurrence** - how many times a given statistical property value has been found in analyzed past draws. For example pool number 6 has been found **3** times in ten latest draws.
- **Occurrence Percentage** - the same value as *Occurrence* but it is given as a percentage of all occurrences.
- **Latest** - how many draws elapsed since the last occurrence of a given statistical property. For example number 11 has been last drawn 8 draws ago. While number 23 came up in the very latest draw so its corresponding value in *Latest* column in statistical table is 1.
- **AVG Interval** - average count of draws that elapsed between two following occurrences of a given statistical property value in analyzed past draws. For example average interval 4 of pool number 6 means that number 6 hits on average in every fourth draw.
- **Min Interval** - the lowest count of draws that elapsed between two following occurrences of a given statistical property value in analyzed past draws. For example minimum interval of 3 of pool number 23 means that the number hit again after two draws at the earliest. While minimum interval of 1 of pool number 11 means that the number hit again in the very next draw since its previous occurrence.
- **Max Interval** - the highest count of draws that elapsed between two following occurrences of a given statistical property value in analyzed past draws. For example maximum interval of 5 of pool number 6 means that the longest delay between two following hits of that number is 5 draws.
- **Due** - statistical probability that a given property will hit in the next draw. *Due* values lower than 1 mean that the given property isn't expected in the next draw. *Due* value higher than 1 mean that the given property is long overdue and should hit in the next draw. *Due* values close to 1 mean that the given property is very close to its average hit cycle and should come up in the next draw. For example *Due* value of 6.00 of pool number 30 means that the number is long overdue because on average it hits in every draw and now hasn't come up in six latest draws (applies to the 10 latest draws in Expert Lotto 6/49 Demo Lottery).

See also [here](#).

Operator	Example	Meaning
=	*Ticket Numbers: Occurrence = 5*	Select pool numbers that appear exactly 5 times in the selected past draws.
>	*Triplets: Latest > 4*	Select triplets that haven't hit for more than 4 draws in the selected past draws.
>=	*Pairs: Occurrence >= 3*	Select pairs that appear 3 or more times in the selected past draws.
<	*Ticket Numbers: Latest < 3*	Select pool numbers that hit in the very latest draw or in previous draw in the selected past draws.
<=	*Pairs: Due <= 0.8*	Select pairs that are not likely to hit again in the next draw.
Highest	*Ticket Numbers: Latest Highest 5*	Select 5 ranks of pool numbers that haven't hit for the longest time in the selected past draws.
Lowest	*Ticket Numbers: Due Lowest 10*	Select 10 ranks of pool numbers that are least likely to hit in the next draw.

Note: Operators *Highest* and *Lowest* select the best and the worst ***ranking*** property values. A *rank* consists of statistical property values that have the same value in given statistical table column. For example when analyzing 10 latest draws in Expert Lotto 6/49 Demo Lottery then the *Latest* column in *Ticket Numbers* table sorted in descending order looks like this:

Main Number	Latest
5	10
31	10

43	10
38	9
11	8
8	8
26	8
48	8
49	8
20	7
33	7
35	7
30	6
15	6
37	6
32	5
1	5
12	5
24	5
more...	*more...*

The highest ranking numbers are the ones with *Latest* value of 10 (*5, 31, 43*), the second best rank is number *39* with *Latest* value of 9, the third best rank are numbers with *Latest* value of 8 (*11, 8, 26, 48, 49*) etc. So filter condition *Ticket Numbers: Latest Highest 3* will select pool numbers with *Latest* values 10, 9 and 8, the numbers are *5, 31, 43, 38, 11, 8, 26, 48, 49*. Filter condition *Ticket Numbers: Latest Highest 1* will select pool numbers *5, 31, 43* - not just the the first row of statistical table sorted in descending order.

Operator *Lowest* works the same way except that it looks at the lowest ranking of numbers, i.e. at the bottom of the table above.

Example

With filter settings on the screen shot below the filter accepts tickets, which contain 1 or 2 numbers that hit most frequently in the last ten draws *AND* are long overdue.

Statistical Filter

Winning Numbers:

| 10 latest draws - Wed 1st, Wed 2nd, Sun 1st, Sun 2nd | Select... |

Analyze: Ticket Numbers

◉ Match all of the following   ○ Match any of the following

| Occurrence ▼ | Highest ▼ | 2 |
| Due ▼ | >= ▼ | 3.0 |

[Add] [Remove]

Applies to 1 to 2 in each ticket.

Matching Tickets:

[Accept] [Reject]   [OK] [Apply] [Cancel]

Accepted: 5,781,006
Rejected: 8,202,810
   Total: 13,983,816

[Preview]

With filter settings on the screen shot below the filter accepts tickets, which contain at least one triplet that has never been drawn yet in the whole lottery history.

With filter settings on the screen shot below the filter accepts tickets, which contain at least one number that hasn't hit for 20 or more draws *OR* at least one number which is long overdue.

Statistical Filter

Winning Numbers:

All 960 draws - Wed 1st, Wed 2nd, Sun 1st, Sun 2nd   [Select...]

Analyze: Ticket Numbers

○ Match all of the following   ◉ Match any of the following

| Latest | >= | 20 |
| Due | > | 4.0 |

[Add] [Remove]

Applies to 1 to 6 in each ticket.

Matching Tickets:

[Accept] [Reject]   [OK] [Apply] [Cancel]

Accepted: 4,616,997
Rejected: 9,366,819
   Total: 13,983,816

[Preview]
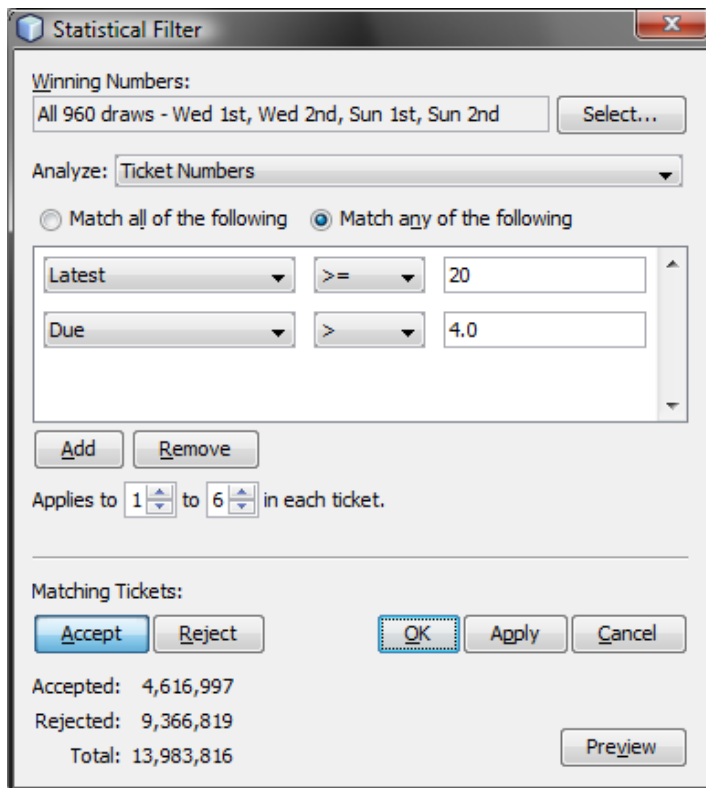
The main advantages of Statistical Filter are:

- Automates repeating filtering tasks that are based on statistical properties, e.g. find tickets with at least one number triplet that haven't been drawn in lottery history.
- Automatically takes into account changes in winning numbers database. There's no need to manually recalculate statistical tables to find e.g. numbers/pairs/triplets etc that are most frequent/least frequent/due/overdue etc in several latest draws when the winning numbers database is updated with numbers from the latest draw.
- Can be grouped together in *Complex Filter* for back-testing and performance evaluation.

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Trend Predictor

Trend Predictor filter is based on automated pattern matching [predictions](). The filter first predicts the trend (*increase/decrease/level*) of selected statistical properties. Then it calculates the statistics of filtered tickets and compares them with the statistics of the latest selected draw. The filter accepts a ticket if its statistical properties match the predicted trend.
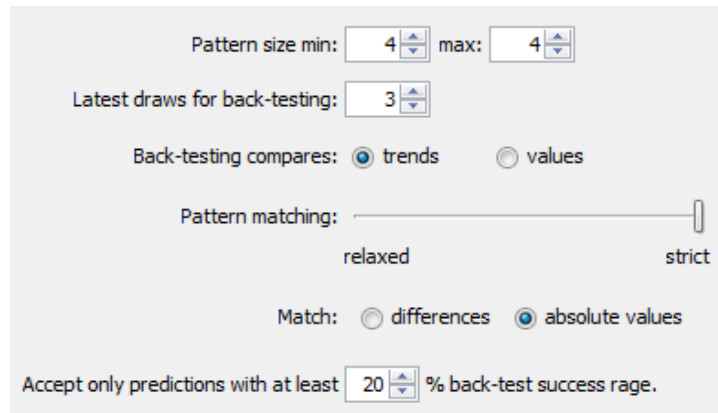
There are two tabs in the filter window. *Properties* tab lists all available statistical properties the filter can predict. Tick the properties you wish to include in your filter condition. You can even select multiple properties and then tick/untick them with a single click. *Prediction Settings* tab contains controls to adjust prediction preferences, read more [here]().

Example

The latest draw in Expert Lotto 6/49 Demo lottery is:

`2010/28, Sun 2nd, 23-29-36-42-44-47-[07]`

Its ratio of odd numbers to even numbers is 3:3 and the ratio of low numbers to high numbers is 1:5. Click menu *Winning Numbers - Predictions* to predict the next values of these statistical properties. In [Predictions]() window choose *50 latest draws* for prediction input, adjust prediction options as on the picture below and press *Finish* button.

When prediction process is finished, you will see in [Winning Numbers Properties]() window that the predicted trend of [Odd/Even]() statistics is *decrease*. That means the next draw is expected to produce either 2:4 or 1:5 or 0:6 ratios of odd/even numbers. The prediction for [Low/High]() statistics shows *level* trend, so the same 1:5 ratio of low/high numbers should be expected in the next draw.

Now we will use *Trend Predictor* filter to find tickets that match the predicted trends:

1. Select menu *Package - Insert - Full Wheel* and load the package with all 13,983,816 combinations.
2. Open *Trend Predictor* filter window and select *Winning Numbers: 50 latest draws*.
3. In *Properties* tab select only *Odd/Even* and *Low/High*. Also choose *At least 2 to 2 predictions must pass*.
4. Switch to *Prediction Settings* and enter the same options as in the picture above.
5. Click *OK* button to start filtering. The filter will leave 811,800 tickets in the package.

All the tickets left in the Package match the predicted trends. Their ratio of low/high numbers is 1:5 **and** their ratio of odd/even numbers is either 0:6 or 1:5 or 2:4 or 3:3.

If you choose *At least 1 to 2 predictions* must match then there will be 9 503 516 tickets left after filtering. Their ratio of low/high numbers is 1:5 **or** their ratio of odd/even numbers is either 0:6 or 1:5 or 2:4 or 3:3.

Note: Even when the predicted trend is *increase*, the filter also accepts tickets that produce the same statistical value, not just tickets with higher statistical values. Likewise, when the predicted trend is *decrease*, the filter also accepts tickets that produce the same statistical value, not just tickets with lower statistical values. This is to relax the filtering conditions a bit and to err on the safe side.

You can combine as many statistical properties in the *Trend Predictor* filter as you want. However keep in mind that some trend predictions may be either contradictory or impossible to match and the filter may reject all tickets. For example if the latest winning numbers are 1-2-3-4-5-6 and trend prediction for the first ticket number is *decrease* then naturally no ticket can match this condition. There is no pool number lower than 1.

When the latest winning numbers are for example 10-11-12-13-14-15 and the predicted trend for the first ticket number is *increase* and the trend of the second number is *decrease* then the predictions are contradictory. Ticket numbers are sorted in ascending order so it is not possible to have the first ticket number greater than 10 and the second number lower than 11.

Note: If it is not possible to make valid prediction for a given statistical property then all filtered tickets are considered as matching the trend prediction of that property.

Match Winning Positions

The filter accepts tickets that have the same numbers at selected ticket positions as selected past draws.

Example

The latest five draws in Expert Lotto 6/49 Demo Lottery are:

```
2010/27, Sun 2nd, 01-06-12-24-32-41-[44]
2010/28, Wed 1st, 16-18-22-23-28-29-[24]
2010/28, Wed 2nd, 02-13-16-17-25-40-[27]
2010/28, Sun 1st, 06-13-14-19-41-42-[29]
2010/28, Sun 2nd, 23-29-36-42-44-47-[07]
```

Filtering with settings *Winning Numbers: 5 latest draws, Matching positions must come from the same draw, Position 1, 2, 3, 4, 5, 6, At least 6 to 6 positions must match* accepts exactly five tickets from the full wheel. The accepted tickets have the same numbers as the five latest draws.

Filtering with settings *Winning Numbers: 5 latest draws, Position 1, 2, 3, 4, 5, 6, At least 6 to 6 positions must match* accepts 1,157 tickets. Each accepted ticket has only the following numbers at the first ticket position: 1, 2, 6, 16 or 23. Numbers allowed at the second ticket position are 6, 13, 18 or 29. The third ticket position can have numbers 12, 14, 16, 22 or 36, fourth position allows numbers 17, 19, 23, 24 or 44, numbers at the fifth position are 25, 28, 32, 41 or 44 and the last ticket position has numbers 29, 40, 41, 42 or 47.

Filtering with settings *Winning Numbers: 5 latest draws, Matching positions must come from the same draw, Position 1, 2, At least 2 to 2 positions must match* accepts tickets that have in the first ticket position numbers 1, 2, 6, 16, 23 and in the second ticket position numbers 6, 13, 18 or 29.

See also Match Winning Numbers filter.

<div align="right">[back to top]</div>

Positional Odd/Even

This filter accepts tickets that have *odd* or *even* numbers at specified ticket positions.

To use the filter, first tick the ticket position you want to filter and then choose whether a ticket number at selected position must be *odd* or *even*. Option *At least X to Y positions must pass* specifies how many positional conditions must be met to accept a given ticket.

Note: Number zero is considered to be an even number.

Example

Filtering with settings *Position 1: Odd, Position 2: Odd, Position 3: Odd, At least 1 to 2 positions must pass* accepts tickets like *1-4-5-10-20-30* because the first and the third ticket numbers are odd so only two of the filter conditions are met as required. Filter rejects tickets like *1-3-5-10-20-30* because all the first three numbers are odd so too many filter conditions are met.

See also Odd/Even ticket filter and Odd/Even statistical properties.

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Positional Low/High

This filter accepts tickets that have *low* or *high* numbers at specified ticket positions. Number is low when it is in the lower half of number pool, number is high when it is in the upper half of number pool.

For example in a x/40 lottery, numbers 1 to 20 are low, numbers 21 to 40 are high numbers. In a x/49 lottery, numbers 1 to 24 are low, numbers 25 to 49 are high.

To use the filter, first tick the ticket position you want to filter and then choose whether a ticket number at selected position must be low or high. Option *At least X to Y positions must pass* specifies how many positional conditions must be met to accept a given ticket.

Example - Expert Lotto 6/49 Demo Lottery

Filtering with settings *Position 1: Low, Position 6: High, At least 1 to 2 positions must pass* accepts tickets like *1-30-35-40-45-49* because the first and the last ticket numbers are low and high respectively. Filter also accepts ticket e.g. *1-2-3-4-5-6* because the first number is low and the last number is also low, so at least one filter condition is met as required.

There is no ticket to pass filter settings *Position 1: High, Position 6: Low, At least 2 to 2 positions must pass*. Because ticket numbers are sorted in ascending order in the Expert Lotto 6/49 demo lottery so there can never be a ticket with the first number higher than the last ticket number.

See also Low/High ticket filter, Low/High statistical properties.

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Numbers At Positions

This filter accepts tickets with selected numbers at selected ticket positions.

To use the filter, first tick the ticket position(s) you wish to filter. Then enter the desired numbers into appropriate edit field(s). The numbers must be separated by comma (,) character. The order of number in the edit fields is not significant. Alternatively, you can click *Select* button to open *Select Numbers* window and choose the desired numbers on the ticket panel using your mouse.

Example

Filtering with settings *Position 1: 1,2,3, Position 6: 49,48,47, At least 2 to 2 positions must pass* accepts tickets like *3-20-30-40-42-49* because its first and last numbers are the ones selected in filter's condition. Ticket e.g. *1-20-21-30-35-40* is rejected because number 40 is not allowed to be in the last ticket position.

See also Ticket Positions statistics.

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Powerballs At Positions

This filter accepts tickets with selected powerball numbers at selected ticket positions.

Note: The filter is available only for lotteries that draw two or more bonus numbers from a separate pool of numbers.

To use the filter, first tick the powerball position(s) you wish to filter. Then enter the desired numbers into appropriate edit field(s). The numbers must be separated by comma (,) character. The order of number in the edit fields is not significant. Alternatively, you can click *Select* button to open *Select Numbers* window and choose the desired numbers on the ticket panel using your mouse.

See also statistics and ticket filter.

Positional Number Range

This filter accepts only tickets that contain numbers within given range at specified ticket positions.

Example - Expert Lotto 6/49 Demo Lottery

- When filter settings are *Position 1: 1-5, Position 6: 45-49, At least 2 to 2 positions must pass* then:
    - 05-16-20-24-32-45 - filter accepts this ticket because the numbers at the first and last ticket positions are within specified range.
    - 06-08-15-18-30-45 - filter rejects this ticket because the first ticket number is out of allowed range.
- There is no ticket to meet filter settings e.g. *Position 1: 30-40, Position 6: 1-20, At least 2 to 2 positions must pass*. Ticket numbers are sorted in ascending order in Expert Lotto 6/49 Demo Lottery so there can never be a ticket with number at the first position higher than the number at the last ticket position.

See also statistics.

Positional Number Movement

This filter compares ticket numbers at selected positions with past winning numbers draws. Number movement is the difference between ticket's number and past winning number at the same position. For example if ticket's first number is 4 and latest winning number at the first position is 23 then the number movement is *4-23=-19*. If ticket number at position 2 is e.g. 33 and the latest winning number at position 2 is 29 then the number movement at position 2 for the latest draw is *33-29=4*.

To use the filter, first click *Select* button to choose the past winning numbers draws to filtered tickets will be compared with. Then tick the ticket position(s) you wish to filter and enter allowed number movement range for each selected position.

Option *All draws must pass* says that filter accepts a ticket only if the number movement is within desired range for all selected past draws. With option *At least one draw must pass* the filter accepts a ticket if the number movement is within the range when compared with at least one of the selected past draws. **Note:** If only a single past draw is selected in the filter window then those two options produce equal filtering results.

Optional settings *Sum of number movement min/max* make the filter condition more strict by limiting the sum of number movement values in selected ticket positions.

Example - Expert Lotto 6/49 Demo Lottery

Draw selection *Latest Range 2 to 3* selects the following two draws:

2010/28 Wed 2nd, 2-13-16-17-25-40-[27]
2010/28 Sun 1st, 6-13-14-19-41-42-[29]

- When filter settings are *Winning Numbers: Latest Range 2 to 3, At least one draw must pass, Position 1: -1 to 1, Position 2: -1 to 1, At least 2 to 2 positions must pass* then:
    - 01-12-20-30-40-49 - filter accepts this ticket because its numbers at the first two positions are one lower then winning numbers from draw *2010/28 Wed 2nd* so at least one draw passed.
    - 04-12-20-30-40-49 - filter rejects this ticket because the number at the first position is outside the allowed range -1 to 1 in both selected draws.
- When filter settings are *Winning Numbers: Latest Range 2 to 3, All draws must pass, Position 1: -5 to 5, Position 2: -5 to 5, At least 2 to 2 positions must pass* then:
    - 01-08-20-30-40-49 - filter accepts this ticket because its numbers at the first two positions are within -5 to 5 range for both selected draws.
    - 08-14-20-30-40-49 - filter rejects this ticket because the number at the first position is outside the allowed range -5 to 5 when compared with draw *2010/28 Wed 2nd* and the selected condition says that all draws must pass.
- When filter settings are *Winning Numbers: Latest Range 2 to 3, All draws must pass, Position 1: -1 to 1, Position 2: -1 to 1, At least 2 to 2 positions must pass* then the filter rejects all tickets because the first number in draw *2010/28 Wed 2nd* is 2 and the first number in draw *2010/28 Sun 1st* is 6 so there is no number that would fit into -1 to 1 range when compared with both of these numbers.
- When filter settings are *Winning Numbers: Latest Range 2 to 3, All draws must pass, Position 1: -5 to 5, Position 2: -5 to 5, At least 2 to 2 positions must pass, Sum of number movement min: -2, max: 2* then:
    - 01-16-20-30-40-49 - filter accepts this ticket because its numbers at the first two positions are within -5 to 5 range for both selected draws and the sum of number movement for the first selected draw is *(1-2) + (16-13) = 2* and the movement sum for the second selected draw is *(1-6) + (16-13) = -2*. Both movement sums are within the allowed range.
    - 01-08-20-30-40-49 - filter rejects this ticket because the movement sum for the first draw is *(1-2) + (8-13) = -6* and the second sum is *(1-6) + (8-13) = -10*. Both values are outside the allowed range.

See also Number Movement statistics.

Positional First/Last Digits

This filter accepts only tickets that contain specified *first/last digits* at specified ticket positions. Each pool number breaks down into two digits. The *first digit* is the leading digit of the number, the *last digit* is the second digit of the number. For the first digit of number 23 is 2, the last digit of that number is 3. The first digit of number 9 is 0, the last digit of that number is 9.

Example

- When filter settings are *Last Digit, Position 2: 4,6,7* then:
  - 01-16-20-24-32-40 - filter accepts this ticket because the number at second position is 16 and its last digit is 6.
  - 02-04-15-18-30-32 - filter accepts this ticket because the number at second position is 4 and its last digit is 4.
  - 02-12-15-18-40-42 - filter rejects this ticket because the number at second position is 12 and its last digit is 2.
- When filter settings are *Last Digit, Position 1: 4,8, Position 3: 2,5, Position 5: 6,9, At least 1 to 2 positions must pass* then:
  - 04-10-15-17-28-30 - filter accepts this ticket because the last digit at the first position is 4 and the last digit at the third position is 5.
  - 04-10-15-17-26-30 - filter rejects this ticket because the last digit at the first position is 4, the last digit at the third position is 5 and the last digit at position 5 is 6. That means the ticket fails filter's condition that at most two positions must pass.

See also First/Last Digits ticket filter, First/Last Digits statistics.

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First/Last Digit Movement

This filter compares first/last digits at selected positions with past winning numbers draws. A digit can either move up - it is greater than the digit at the same ticket position of a past draw, or it can move down - it is lower than the digit at the same ticket position of a past draw, or it can be the same as in the past draw it is being compared with.

To use the filter, first click *Select* button to choose the past winning numbers draws to filtered tickets will be compared with. Then tick the ticket position(s) you wish to filter and choose the desired digit movement for each selected position.

Option *All draws must pass* says that filter accepts a ticket only if the digit movement is matching all selected past draws. With option *At least one draw must pass* the filter accepts a ticket if the digit movement is matching at least one of the selected past draws. **Note:** If only a single past draw is selected in the filter window then those two options produce equal filtering results.

Example - Expert Lotto 6/49 Demo Lottery

Draw selection *Latest Range 2 to 3* selects the following two draws:

2010/28 Wed 2nd, 2-13-16-17-25-40-[27]
2010/28 Sun 1st, 6-13-14-19-41-42-[29]

- When filter settings are *Winning Numbers: Latest Range 2 to 3, At least one draw must pass, Last Digit, Position 1: up, Position 2: up, At least 2 to 2 positions must pass* then:
  - 03-04-05-06-07-08 - filter accepts this ticket because its last digits at the first two positions are 3 and 4 respectively. Those digits are greater than the last digits 2 and 3 in draw *2010/28 Wed 2nd* so at least one draw passed.
  - 01-04-05-06-07-08- filter rejects this ticket because the last digit 1 at the first ticket position is lower than appropriate last digit in both selected draws.
- When filter settings are *Winning Numbers: Latest Range 2 to 3, All draws must pass, Last Digit, Position 1: equal+up, Position 2: equal+up, Position 3: equal+up, Position 4: equal+up, Position 5: equal+up, Position 6: equal+up, At least 6 to 6 positions must pass* then:
  - 06-07-08-09-15-16 - filter accepts this ticket because all its last digits are greater or equal to the last digits in both selected draws.
  - 05-07-08-09-15-16 - filter rejects this ticket because the last digit 5 in the first ticket position if lower than the last digit 6 in draw *2010/28 Sun 1st* and the selected condition says that all draws must pass.

See also Digits Movement Patterns statistics.

Sum Range

This filter is similar to Sum Range filter. The filter accepts tickets that have the sum of their main numbers at selected ticket positions in desired range.

Example

When filtering with settings *Ticket positions: 3, 4, Min sum: 10, Max sum: 20* then:
- 01-02-03-07-08-09 - filter accepts this ticket because the sum of numbers at third and fourth position is *3+7=10*.
- 07-08-09-11-12-13 - filter accepts this ticket because the sum of number at selected ticket positions is *9+11=20*.
- 07-08-10-11-12-13 - filter rejects this ticket because the sum of selected numbers is *10+11=21* which is out of allowed range.

When filtering with settings *Ticket positions: 1, Min sum: 10, Max sum: 20* then the filter will accept tickets that have their first number in the range of 10 to 20.

See also Sum Range filter.

Average Distance

This filter accepts tickets that have the average distance of neighboring numbers in selected range.

The distance is the difference of numbers at neighboring ticket positions. For example in ticket 23-29-36-42-44-47 the distance of numbers 29 and 23 is 6. The distance of the third number from the second number is 36-29=7. So the distance values are 6, 7, 6, 2, 3, the average distance value is then 4.8.

Example

When filter settings are *Average distance min: 4 max: 5* then
- 01-02-03-04-05-21 - filter accepts this ticket because its average distance is 4.0.
- 01-02-03-04-05-20 - filter rejects this ticket because its average distance is 3.8 which is out of selected range.

When filter settings are *Average distance min: 5.6 max: 5.6* then
- 21-45-46-47-48-49 - filter accepts this ticket because its average distance is 5.6.
- 01-02-03-04-05-06 - filter rejects this ticket because its average distance is 1.0 which is out of selected range.

See also Average Distance statistical property.

Vertical Pairs Sum

Accepts tickets that produce given sum ranges when adding numbers at the same ticket positions with selected past draw.

Example

The 11 latest draws in Expert Lotto 6/49 Demo Lottery are:

2010/28 Sun 2nd	23	29	36	42	44	47	[07]
2010/28 Sun 1st	06	13	14	19	41	42	[29]
2010/28 Wed 2nd	02	13	16	17	25	40	[27]
2010/28 Wed 1st	16	18	22	23	28	29	[24]
2010/27 Sun 2nd	01	06	12	24	32	41	[44]
2010/27 Sun 1st	02	15	22	29	30	37	[42]

2010/27 Wed 2nd	20	23	25	30	33	35	[07]
2010/27 Wed 1st	08	11	19	26	48	49	[18]
2010/26 Sun 2nd	08	11	18	32	36	38	[06]
2010/26 Sun 1st	05	06	11	31	40	43	[32]
2010/26 Wed 2nd	8	11	18	32	36	38	[6]

Filtering with settings *Winning Numbers: All draws, Draw distance: 2, Position 1: Sum range min: 10 max: 15, All 1 to 1 positions must pass* will compare the filtered tickets with draw *2010/28 Wed 2nd* as the draw distance is set to 2 and it will accept tickets where the sum of numbers at the first ticket position is in the range of 10 to 15.

For example ticket with numbers 4-5-6-7-8-9 will be accepted because its first number is 4 and the first number of draw *2010/28 Wed 2nd* is 6 so *4+6=10* which is in the selected range.

Filtering with settings *Winning Numbers: All draws, Draw distance: 10, Position 1: Sum range min: 10 max: 15, Position 6: Sum range min: 30 max 35, All 2 to 2 positions must pass* will compare the filtered tickets with draw *2010/26 Wed 2nd* as the draw distance is set to 10 and it will accept tickets where the sum of numbers at the first ticket position is in the range of 10 to 15 and the sum of numbers at the last ticket position is 40 to 45.

Only a single ticket will be accepted: 2-3-4-5-6-7 will be accepted because its first number is 2 and the first number of draw *2010/26 Wed 2nd* is 8 so *2+8=10* which is in the selected range and their last numbers are 7 and 38 respectively which means their sum is 45 which is again in the desired range..

Note: Draw distance value 0 means that the filtered tickets are compared with the very latest draw in the selection of past draws.

See also Vertical Pairs Sum statistics.

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Draw Ranges

This filter selects tickets with numbers that fall into ranges formed by previous draws.

Example

The latest two draws in Expert Lotto 6/49 Demo Lottery are:

2010/28, Sun 1st, 06-13-14-19-41-42-[29]
2010/28, Sun 2nd, 23-29-36-42-44-47-[07]

The ranges created by the latest draw 2010/28, Sun 2nd are:

Position	Min	Max
1	1	23
2	24	29

3	30	36
4	37	42
5	43	44
6	45	49

Ranges for previous draw `2010/28, Sun 1st` are:

Position	Min	Max
1	1	6
2	7	13
3	14	14
4	15	19
5	20	41
6	42	49

Note that the lower range for position 1 is always the lowest pool number (usually 1) and the upper range in the last position is the highest pool number (e.g. 49 in a x/49 lottery).

When filtering with settings *Latest 2 draws, Any draw must pass, Position 1 to 6: Min 1, Max 1, At least 6 to 6 positions must pass* then:

- 01-07-14-15-20-42 - filter accepts this ticket because each ticket number is the lower range of draw `2010/28, Sun 1st` and any of the selected draws must pass.
- 22-27-36-39-44-48 - filter accepts this ticket because its numbers fit into the ranges of draw `2010/28, Sun 2nd` and just one of the selected two draws is required to pass.
- There is no ticket that would fall into the range of both selected draws because ranges at position 2 are mutually exclusive.

Note: The filter is available only in lotteries where all main numbers come from a single pool, i.e. Jackpot-like lotteries.

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Sums History

This filter accepts tickets that produce *History sum differences* in given range in selected *History Levels*.

To use the filter, first click *Select* button to choose past winning numbers draws to calculate the *History* values from. Then tick *History Levels* you wish to filter in the table below and enter the desired minimum and maximum difference for each selected *Level*. Column *Sum (Prev)* shows the *History Sum* values corresponding to the latest draw from the selection of past winning numbers. Column *Difference (Prev)* is *History sum difference* corresponding to the latest draw

(History sum of the latest draw minus the History sum value of the second latest draw from the selection of past winning numbers). Column *Range* shows the selected range of History values for given *Level*.

With option *At least X to Y levels must pass* you can specify the minimum and maximum count of selected *Levels* that must have the *History* value in the given range to pass the whole filter.

Optional condition *The difference in X to Y levels is at most A to B* makes the filter more strict by specifying the minimum and maximum difference for several History Levels. **Note:** If the range specified by values *A* and *B* is bigger than the ranges in all selected Levels then this additional condition has no effect on filtering results.

See also In Range Differences statistics.

▶ You can tick/untick multiple *Levels* with a single click - select table rows you wish to modify using your mouse and then click into the *Level* column of one of the selected rows.

▶ You can increment or decrement differences in multiple table cells using your keyboard - select table cells your wish to modify and then press *CTRL+up arrow* key to increment values in all selected cell. Press *CTRL+down arrow* key to decrement values in all selected cells.

▶ You can paste the differences from system clipboard. For example highlight two rows or two columns of cells in MS Excel, press *CTRL+C* to copy the highlighted values into system clipboard, click into the table in filter window and press *CTRL+V* to paste the values as new filter parameters. Pasting a single row or a single column of cells inserts the values into both *Min* and *Max* columns respectively.

Note: When using this filter from My Estimates window, most of the filter settings are already preselected.

Example - Expert Lotto 6/49 Demo Lottery

- When filter settings are *Winning Numbers: 10 latest draws, Level 0: Min Difference 10, Max Difference 20, Level 2: Min Difference 10, Max Difference 20, Level 2: Min Difference 10, Max Difference 20, At least 3 to 3 levels must pass* then the filter accepts tickets which produce increased *History* sum values in the first three Levels:
    - 01-02-03-06-12-23 - filter accepts this ticket because its History sum values in *Levels 0* to *2* are *387, 764* and *1201* respectively. Which makes differences of *+11, +20* and *+15* when compared to the latest selected draw. All three values are in desired ranges.
    - 01-02-03-04-05-06 - filter rejects this ticket because its History sum values are *372, 759* and *1198* in *Levels 0* to *2*. Which makes differences of *-4, +15* and *+12*. Only two *Levels* are in the desired range.
- When filter settings are *Winning Numbers: 10 latest draws, Level 0: Min Difference 10, Max Difference 20, Level 2: Min Difference 10, Max Difference 20, Level 2: Min Difference 10, Max Difference 20, At least 2 to 3 levels must pass* then:
    - 01-02-03-04-05-06 - filter accepts this ticket because its History sum values are *372, 759* and *1198* in *Levels 0* to *2*. Which makes differences of *-4, +15* and *+12* and at least two *Levels* are in the desired range.
    - 01-02-03-04-05-08 - filter rejects this ticket because its History sum values are *366, 761* and *1195* in *Levels 0* to *2*. Which makes differences of *-10, +17* and *+9*. Only one *Level* is in desired range which is outside the allowed range in condition *At least 2 to 3 levels must pass*.
- When filter settings are *Winning Numbers: 10 latest draws, Level 0: Min Difference 10, Max Difference 20, Level 2: Min Difference 10, Max Difference 20, Level 2: Min Difference 10, Max Difference 20, At least 3 to 3 levels must pass, The difference in 1 to 1 levels is at least 13 to 14* then the filter accepts tickets which produce increased *History* sum values in the first three *Levels* and exactly one of those *Levels* has the difference of 13 to 14:
    - 01-02-03-06-12-36 - filter accepts this ticket because its differences are *+11, +15* and *+14* in *Levels 0* to *2*. All the differences are in the desired range 10 to 20 and also the difference in *Level 2* is in the range of 13 to 14 as specified in filter's last condition.
    - 01-02-03-06-12-23 - filter rejects this ticket because its differences are *+11, +20* and *+15* in *Levels 0* to *2*. All the difference are in desired range of 10 to 20 but there's no *Level* with the difference of 13 to 14 as specified in filter's last condition.

Segments

This filter accepts tickets with numbers that fall into selected *segments* in selected [History](#) *Level*.

To use the filter, first click *Select* button to choose past winning numbers draws to calculate *History* values from. Then pick the *Level* you wish to filter in *Level* combo box. **Note:** You can filter only one *History Level* at a time. Next tick the segments you wish to use in the filter in the table below and enter the minimum and maximum count of ticket numbers each selected segment must have. Table on the right shows the current distribution of pool numbers into *History segments* for selected *Level*.
Click *Customize* button to adjust segmentation settings for this filtering session.

Option *At least X to Y segments must pass.* allows to relax the filter condition by specifying how many selected segments must pass. For example with option *At least 2 to 3 segments must pass* the filter will also accept tickets whose numbers with into to two selected segments only.

Example - Expert Lotto 6/49 Demo Lottery

- When filter settings are *Winning Numbers: 10 latest draws, Level 0, Segment 1 (1-6): Min 2, Max 2, Segment 2 (7-12): Min 2, Max 2, Segment 3 (13 and more): Min 2, Max 2* then the filter accepts only tickets with segment combination of *2-2-2* in *Level 0*:
  - 01-02-03-04-05-07 - filter accepts this ticket, because numbers 1 and 2 are from *Segment 1*, numbers 4 and 5 are from *Segment 2* and numbers 3 and 7 are from *Segment 3* in *Level 0*.
  - 01-02-03-04-05-06 - filter rejects this ticket because it has three numbers from *Segment 1* in *Level 0* (numbers 1, 2 and 6) which is outside the allowed range.
- When filter settings are *Winning Numbers: 10 latest draws, Level 0, Segment 1 (1-6): Min 2, Max 2* then the filter accepts only tickets that have exactly two numbers in *Segment 1* in *Level 0*:
  - 01-02-03-04-05-08 - filter accepts this ticket, because numbers 1 and 2 are from *Segment 1* in *Level 0*.
  - 43-45-46-47-48-49 - filter rejects this ticket because it has just one number (47) in *Segment 1* in *Level 0*.

Segment Combinations History

This filter accepts tickets that have selected *Segment Combinations* at selected History *Levels*.

To use the filter, first click *Select* button to choose past winning numbers draws to calculate *History* values from. Then tick the *Levels* you wish to filter in the table below. Next tick the *Segment Combinations* that are required to appear in selected *Levels*.

With option *At least X to Y levels must pass* you can specify the minimum and maximum count of selected *Levels* that must have one of the selected *Segment Combinations* to pass the whole filter.

Click button *Customize* to adjust segmentation settings for the current filtering session.

▶ You can tick/untick multiple *Levels* or *Segment Combinations* with a single mouse click - first select table rows you wish to modify with your mouse then click into one of the selected cells.

Example - Expert Lotto 6/49 Demo Lottery

- When filter settings are *Winning Numbers: 10 latest draws, Levels: 0, 1, 2, Segment Combinations: 6-0-0, At least 3 to 3 levels must pass* then there's only a single ticket which has *Segment Combination 6-0-0* in the first three Levels: 06-18-23-25-29-30.

- When filter settings are *Winning Numbers: 10 latest draws, Levels: 0, 1, 2, Segment Combinations: 6-0-0, 0-6-0, 0-0-6, At least 3 to 3 levels must pass* then:
    - 06-18-23-25-29-30 - filter accepts this ticket because it has *Segment Combination 6-0-0* in all the first three Levels.
    - 01-12-24-28-36-40 - filter accepts this ticket because its *Segment Combinations* in Levels 0 to 2 are *6-0-0, 0-6-0* and *6-0-0* respectively.
    - 01-02-06-12-13-14 - filter rejects this ticket because it has only one of the selected *Segment Combinations* - *6-0-0* in Level 0.

- When filter settings are *Winning Numbers: 10 latest draws, Levels: 0, 1, 2, Segment Combinations: 6-0-0, 0-6-0, 0-0-6, At least 1 to 3 levels must pass* then:
    - 01-02-06-12-13-14 - filter accepts this ticket because it has at least one of the selected *Segment Combinations* - *6-0-0* in Level 0.
    - 01-02-03-04-05-06 - filter rejects this ticket because its *Segment Combinations* in Levels 0 to 2 are *3-2-1, 4-1-1* and *4-1-1* respectively and none of these combinations is allowed in filter's condition.

Standard Deviation of Differences

This filter accepts tickets that produce *History differences* whose standard deviation is in selected range. Low standard deviation values means that *History differences* in all *Levels* are very similar. High standard deviation values mean that *History differences* differ a lot from each other in all *Levels*.

Example - Expert Lotto 6/49 Demo Lottery

When filter settings are *Winning Numbers: 10 latest draws, Standard deviation min: 0.0, max 5.0* then:

- `01-03-09-23-28-42` - filter accepts this ticket because the standard deviation of History differences is 3.27. The History differences are: +1, +9, +7, +2, +5, +12, +8, +4, +6, +9, +8 in Levels 0 to 10. The differences are very similar hence their standard deviation is very low.

- `01-02-03-04-05-06` - filter rejects this ticket because the standard deviation of History differences is 17.25. The History differences are: -27, +15, +10, +4, -3, +22, +14, -20, +23, -16, -8. The differences range from -27 to +23 so their standard deviation is very high.

Unique Sum Differences

This filter accepts tickets that have desired count of unique *History sum differences*. A *History* value is unique if it doesn't repeat in any other *Level*.

Example - Expert Lotto 6/49 Demo Lottery

When filter settings are *Winning Numbers: 10 latest draws, The count of unique history differences: 11 to 11* then:

- `01-02-03-04-05-07` - filter accepts this ticket because the History differences for this ticket are: -27, +15, +10, +4, -3, +22, +14, -20, +23, -16, -8. There are 11 unique values because none of the values repeat in any other level.
- `01-02-03-04-05-06` - filter rejects this ticket because the History differences for this ticket are: -4, +15, +12, +20, -9, +5, +12, -31, +21, -16 , -17. There are only 10 unique differences because value from Level 2 repeats in Level 6.

History Number Differences

This filter accepts tickets with numbers that have *History number differences* within given range in selected *Levels*.

▶ You can tick/untick multiple *Levels* with a single mouse click - first select table rows you wish to modify with your mouse then click into one of the selected cells.

Example - Expert Lotto 6/49 Demo Lottery

When filter settings are *Winning Numbers: 10 latest draws, Levels: 0, 1, 2, Number difference: 5 to 5, Total number count: 2 to 18, Number count in a single level: 0 to 6* then the filter accepts tickets that have at least two numbers with difference of 5 in Levels 0 to 2 in Number History table:

- `01-02-03-04-05-06` - filter accepts this ticket because the History difference of number 1 in Level 0 is 5 and History difference of number 6 in Level 2 is also 5.
- `01-02-03-04-05-07` - filter rejects this ticket because it has only one number with History differences of 5, it is number 1 in Level 0.

When filter settings are *Winning Numbers: 10 latest draws, Levels: 0, 1, 2, Number difference: 5 to 5, Total number count: 3 to 18, Number count in a single level: 1 to 1* then the filter accepts tickets that have exactly one number with the difference of 5 in each Level 0 to 2 in *Number History* table:

- `01-02-03-04-06-18` - filter accepts this ticket because it has one number with the History difference of 5 in Level 0 (number 1), one number with the History difference of 5 in Level 1 (number 18) and one number with the History difference of 5 in Level 2 (number 6).
- `01-02-03-04-06-12` - filter rejects this ticket because it has two numbers with the History difference of 5 in Level 0 - numbers 1 and 12 - which is outside the allowed range.

See also History Number Differences + Odd/Even ticket filter and Number Differences summary statistics.

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History Number Differences + Odd/Even

This filter is very similar to the plain History Number Differences filter except that it adds additional condition how many matching numbers must be *odd/even*.

Example - Expert Lotto 6/49 Demo Lottery

When filter settings are *Winning Numbers: 10 latest draws, Levels: 0, 1, 2, Number difference: 5 to 5, Total number count: 2 to 18, Odd number count: 0 to 18* then the filtering results are the same as when using *History Number Differences* with settings *Winning Numbers: 10 latest draws, Levels: 0, 1, 2, Number difference: 5 to 5, Total number count: 2 to 18, Number count in a single level: 0 to 6.*

When filter settings are *Winning Numbers: 10 latest draws, Levels: 0, 1, 2, Number difference: 5 to 5, Total number count: 3 to 18, Odd number count: 3 to 3* then the filter accepts tickets that have at least 3 numbers with the History difference of 5 in Levels 0 to 2 in Number History table and exactly three of such numbers are odd:

- `01-02-03-04-25-31` - filter accepts this ticket because the numbers with the History difference of 5 are number 1 in Level 0, number 25 in Level 2 and number 31 in Level 2. All three numbers are odd.
- `01-02-03-06-25-31` - filter accepts this ticket because the numbers with the History difference of 5 are number 1 in Level 0, number 6 in Level 2, number 25 in Level 2 and number 31 in Level 2. Three of those numbers are odd.
- `01-02-03-04-05-06`- filter rejects this ticket because it does have numbers with the History difference of 5 - number 1 in Level 0 and number 6 in Level 2 - but only one of those numbers is odd which is outside the allowed range.

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Negative/Positive History Differences

This filter accepts tickets that have desired count of negative or positive *History sum differences* in selected *Levels*.

▶ You can tick/untick multiple *Levels* with a single mouse click - first select table rows you wish to modify with your mouse then click into one of the selected cells.

Example - Expert Lotto 6/49 Demo Lottery

When filter settings are *Winning Numbers: 10 latest draws, Levels: 0, 1, 2, Negative differences count: 3 to 3, Positive differences count 3 to 3* then:

- `01-02-03-04-09-15` - filter accepts this ticket because the History differences for this ticket are: *-13, -1, -29* at Levels 0 to 2 respectively. All the differences are negative.
- `01-02-03-04-05-06` - filter rejects this ticket because the History differences for this ticket are: *-4, +15, +12* and only one of them is negative which is outside the allowed range.

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Odd/Even History Sums

This filter accepts tickets that produce either *odd* or *even History Sum* values at selected *Levels*.

To use the filter first click *Select* button to choose past winning numbers draws to calculate *History* values from. Then tick the *Levels* you wish to filter in the table below. Next tick either *Odd Sum* or *Even Sum* column or both columns in selected *Levels*.
With option *Odd sum count X to Y* you can add another filtering condition stating that a ticket is accepted only if it produces at least *X* to *Y* odd sums in selected Levels.

▶ You can tick/untick multiple table cell with a single mouse click - first select table rows you wish to modify with your mouse then click into one of the selected cells.

Example - Expert Lotto 6/49 Demo Lottery

- When filter settings are *Winning Numbers: 10 latest draws, Level 0: Odd, Level 1: Odd, Odd sum count 0 to 2* then
  - 01-02-03-04-05-07 - filter accepts this ticket because its History sums are 349 in Level 0 and 759 in Level 1 and both sum values are odd.
  - 01-02-03-04-05-06 - filter rejects this ticket because its History sum is 372 in Level 0 which is an even number.
- When filter settings are *Winning Numbers: 10 latest draws, Level 0: Odd, Even, Level 1: Odd, Even, Odd sum count 1 to 1* then
  - 01-02-03-04-05-07 - filter rejects this ticket because its History sums are 349 in Level 0 and 759 in Level 1. Both sum values are odd which is outside allowed range.
  - 01-02-03-04-05-06 - filter accepts this ticket because its History sums are 372 in Level 0 and 759 in Level 1. So only one sum value is odd as specified in filter conditions.

Unique Number Differences

This filter accepts tickets with numbers that have selected count of unique *History number differences* within in each selected *Level*. History difference of a ticket number is unique if no other number in the filtered ticket has the same History difference value. Optionally it is possible to specify the total count of such unique differences across all selected Levels.

▶ You can tick/untick multiple *Levels* with a single mouse click - first select table rows you wish to modify with your mouse then click into one of the selected cells.

Example - Expert Lotto 6/49 Demo Lottery

Click menu *History - Latest* to display the number History values for 10 latest draws. Switch *Show as* combo box to *Differences Only* and you will see that History differences in Level 0 are:

Number	Level 0	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	Level 8	Level 9	Level 10
23	1	3	3	8	2	5	1	2	4	1	8
29	1	3	2	12	6	17	3	10	2	1	5
36	1	8	4	18	4	4	3	9	4	16	1
42	1	1	19	18	13	11	14	2	16	6	5
44	1	11	14	8	6	3	11	7	27	1	14
47	1	10	21	12	1	6	9	7	1	1	5
6	2	3	5	6	11	20	6	12	9	2	17
13	2	1	19	2	2	22	21	4	2	1	2
14	2	20	11	22	5	7	14	1	8	5	3
19	2	6	10	4	1	3	8	5	15	7	7
41	2	3	14	18	3	18	5	2	2	4	3
2	3	3	17	8	2	12	2	11	2	13	7
16	3	1	10	29	7	13	2	5	3	5	3
17	3	28	2	3	8	7	2	16	11	2	3

25	3	4	5	2	5	5	1	7	3	3	4
40	3	7	6	15	5	6	4	15	2	11	2
18	4	5	2	16	23	5	1	3	3	2	2
22	4	2	10	11	12	4	6	3	20	7	4
28	4	9	5	7	16	13	7	4	7	4	4
1	5	11	4	1	9	6	1	30	3	22	6
12	5	7	3	2	2	2	7	2	4	10	29
24	5	9	2	5	13	2	3	19	10	14	9
32	5	4	9	5	5	8	13	2	4	17	3
15	6	7	45	10	3	18	5	9	20	8	1
30	6	1	6	15	2	1	3	3	1	5	1
37	6	11	15	3	11	5	1	8	3	1	10
20	7	16	4	2	1	12	4	6	10	1	15
33	7	4	8	1	1	25	11	28	1	14	6
35	7	4	3	5	18	5	1	4	2	9	11
8	8	1	8	8	16	6	8	21	10	12	14
11	8	1	1	8	11	10	10	10	13	15	6
26	8	3	29	2	6	13	1	2	6	14	1
48	8	12	2	1	13	11	2	30	5	2	22
49	8	7	2	15	13	14	2	7	19	3	7
38	9	12	12	5	2	30	3	5	5	1	6
5	10	2	8	7	18	3	5	3	3	21	1
31	10	2	5	9	7	7	5	5	6	15	17
43	10	3	16	30	1	18	6	8	3	9	3
4	11	13	1	6	17	2	17	22	8	6	19
46	12	2	27	3	5	1	3	3	8	10	10
10	13	19	5	15	2	3	18	8	18	19	2
21	14	64	3	23	2	1	2	1	12	6	11
9	15	14	9	12	3	1	12	5	10	6	2
34	15	1	8	6	3	15	18	6	3	2	9

39	15	3	2	23	2	1	5	2	5	10	7
27	19	1	6	2	4	6	22	2	8	15	14
3	22	2	2	1	1	1	6	2	3	1	16
7	25	3	7	22	5	3	4	1	7	2	8
45	34	1	11	18	1	2	16	33	2	2	5

Please note that the table above is sorted in ascending order by column *Level 0*.

When filter settings are *Winning Numbers: 10 latest draws, Levels: 0, Unique number differences in each Level 6 to 6, Total count of unique number differences 6 to 6, At least 1 to 1 Level must pass* then each number in accepted tickets will have a different History difference in Level 0. Such a ticket is for example `01-02-03-04-05-06`
Filter rejects for example ticket `01-02-03-04-06-13` because numbers 6 and 13 have the same History difference 2 in Level 0.

When filter settings are *Winning Numbers: 10 latest draws, Levels: 0, Unique number differences in each Level 1 to 1, Total count of unique number differences 1 to 1, At least 1 to 1 Level must pass* then each number in accepted tickets will have the same History difference in Level 0. Looking at the table above we can see there are only six numbers with the same difference in Level 0: 23-29-36-42-44-47. That means the latest winning numbers.

See also Unique Number Differences statistics.

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Number Differences Sum

This filter sums *History differences* of numbers in filtered tickets and accepts those tickets that have such a sum in given range in selected *Levels*.

▶ You can tick/untick multiple *Levels* with a single mouse click - first select table rows you wish to modify with your mouse then click into one of the selected cells..

Example - Expert Lotto 6/49 Demo Lottery

When filter settings are *Winning Numbers: 10 latest draws, Levels: 0, 1, 2, Sum of number differences min: 10 max: 30, At least 3 to 3 levels* must pass then:

- 01-02-11-12-18-23 - filter accepts this ticket because the sum of History number differences in Level 0 is 5+3+8+5+4+1=26, the sum in Level 1 is 11+3+1+7+5+3=30 and in Level 2 it is 4+17+1+3+2+3=30. The sum in all selected Levels is within allowed range.
- 01-02-03-11-12-18 - filter rejects this ticket because the sum in Level 0 is 47, in Level 1 it is 29 and in Level 2 it is 29. Only two Levels have the sum within selected range however the filter condition requires three such Levels.

When filter settings are *Winning Numbers: 10 latest draws, Levels: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, Sum of number differences min: 40 max: 50, At least 11 to 11 levels must pass* then the filter will find just 4 tickets out of nearly 14 millions that have the sum of *History number differences* in the range of 40 to 50 in all 11 *Levels*.

See also Number Differences Sum statistical property.

Match Past Sums

The filter accepts tickets that have the same History sum value in selected Levels as selected past draw.

Example - Expert Lotto 6/49 Demo Lottery
The History sums for the latest draw are:

Level	History Sum
0	376
1	744
2	1186
3	1670
4	1999
5	2412
6	2746
7	3158
8	3511
9	3875
10	4245

When filter settings are *Winning Numbers: 1 latest draw, Levels 0 to 10, Match at least 6 to 11 levels* then the filter will accept a single ticket 4-10-26-28-29-46. Its History sums are **376**, **744**, 1166, 1674, 1996, **2412**, **2746**, **3158**, **3511**, 3870, 4253. Six History sums are the same as in the selected latest draws.

See also Sums History filter.

Match Past Differences

The filter accepts tickets that have the same History difference value in selected Levels as selected past draw.

Example - Expert Lotto 6/49 Demo Lottery

The History differences for the latest draw are:

Level	History Sum
0	+13
1	-14
2	-27
3	+17
4	+3
5	+8
6	+12
7	-5
8	+23
9	+11
10	+31

When filter settings are *Winning Numbers: 1 latest draw, Levels 0 to 10, Match at least 5 to 11 levels* then the filter will accept only 5 tickets. One of them is for example ticket 7-13-18-26-31-41 with History differences -2, +32, **-27**, -20, **+3**, -19, **+12**, +32, **+23**, **+11**, +16 in Levels 0 to 10. Five History differences are the same as in the selected latest draw.

See also Match Past Sums filter and Sums History filter.

Sum Movement

The filter accepts tickets that produce History sums in selected Levels lower or greater than the History sums in selected past draws.

For example the History sums of the latest draw in the demo *Expert Lotto 6/49* lottery are 376, 744, 1186, 1670, 1999, 2412, 2746, 3158, 3511, 3875 and 4245 in Levels 0 to 11.

When the filter settings are *Winning Numbers: 10 latest draws, Level 0: decrease, Level 1: decrease, Level 2: decrease, Level 3: decrease, Level 4: decrease, Level 5: decrease, Level 6: decrease, Level 7: decrease, Level 8: decrease, Level 9: decrease, Level 10: decrease, At least 11 to 11 levels must pass* then the filter will select just 27 tickets from the full wheel. All these tickets will produce History sums lower than 376 in Level 0, lower than 744 in Level 1 etc.

See also History Sum Movement statistics and History Differences Movement filter.

Differences Movement

The filter accepts tickets that produce History differences in selected Levels lower or greater than the History differences in selected past draws.

For example the History differences of the latest draw in the demo *Expert Lotto 6/49* lottery are +13, -14, -27, +17, +3, +8, +12, -5, +23, +11 and +31 in Levels 0 to 11.

When the filter settings are *Winning Numbers: 10 latest draws, Level 0: decrease, Level 1: decrease, Level 2: decrease, Level 3: decrease, Level 4: decrease, Level 5: decrease, Level 6: decrease, Level 7: decrease, Level 8: decrease, Level 9: decrease, Level 10: decrease, At least 11 to 11 levels must pass* then the filter will select 475 tickets from the full wheel. All these tickets will produce History differences lower than 13 in Level 0, lower than -14 in Level 1 etc.

See also History Differences Movement statistics and History Sums Movement filter.

Analyzing Tickets

The main purpose of ticket analysis is to find recurring patterns in past draws providing hints for the prediction of numbers for the next draw. There are many statistical properties that can be analyzed and evaluated - for example the ratio of odd and even numbers, how many numbers repeat from previous draw(s), or the occurrence of selected triplets and pairs of numbers etc. The results of statistical analysis are commonly used as input parameters for ticket filtering to reduce the list of all possible number combinations down to a reasonable count of tickets.

Analyzed statistical properties are available in various tables and charts. There are tables showing statistical properties of a single ticket or a single past draw. There are also summary tables and summary charts showing how many tickets/draws have a given statistical property.

To analyze tickets in the Package click menu *Package - Analyze*, to analyze past draws click menu *Winning Numbers - Analyze* to open Tickets Analyzer wizard window where you can select which statistical properties are to be evaluated. Per-ticket statistical properties of Package tickets are available from menu

Package - Show As - Properties. Per-draw statistical properties of past winning numbers are available from menu *Winning Numbers - Show As - Properties* and from menu *Winning Numbers - Show As - Charts*.

Statistics Analyzer

Analyzer window shows [summary statistics](#) of past winning numbers or summary statistics of tickets in the Package. *Analyzer* window opens from [Tickets Analyzer](#) wizard which is available from menu *File - New - Analyzer*.

Toolbar at the top of the analyzer window provides the following options:

- 🌀 - reopens *Ticket Analyzer* wizard where you can choose a different selection of tickets or draws to be analyzed or select different statistics to be calculated.
- *Analyzer list* - the combo box lists statistics selected in the *Tickets Analyzer* wizard. Use the combo box to switch to a different statistical table or chart in the analyzer window.
- ⊞ - shows the currently selected statistics as a table, [see below](#).
- 📊 - shows the currently selected statistics as a chart, [see below](#).

▶ Hover mouse cursor above *Analyzer* window title bar to see a tooltip showing which tickets have been analyzed, for example a selection of past winning numbers draws or tickets in the Package.

Statistical Tables

Most statistical tables in the *Analyzer* window have the following columns:

- *Statistical property name* - the name of the first table column depends on the statistics currently selected in the combo box at the top of the *Analyzer* window.
- *Occurrence* - shows the count of tickets/draws that have the given statistical property.
- *[%]* - shows the percentage of tickets/draws that have the given statistical property.

Example

Odd / Even	Occurrence	[%]
0:6	134,596	0.96
1:5	1,062,600	7.60
2:4	3,187,800	22.80
3:3	4,655,200	33.29
4:2	3,491,400	24.97

5:1	1,275,120	9.12
6:0	177,100	1.27

The table above shows the ratio of odd/even ticket numbers calculated for all possible combinations in a 6/49 lottery. From the table you can see that the most frequent combination is 3 odd numbers and 3 even numbers. There are 4,655,200 such tickets which makes 33.29% of all possible number combinations. The least frequent combination is *0 : 6*, there are only 134,596 such tickets, that means 0.96% of all possible numbers combinations. So from strictly statistical point of view number, combinations with odd/even ratio *3:3* should be preferred while number combinations with odd/even *0:6* should be avoided when preparing your bet for the next draw.

▶ Click any table column header to sort the table in ascending or descending order. Drag column header borders to resize table columns. Drag column headers to change the order of columns in the table.

▶ You can change the count of decimal places used for values in statistical tables using menu *Tools - Options - Statistics - Decimal places*.

Draw Intervals

When estimating which statistical property will hit in the next draw it's useful to know how many draws elapsed since the last hit of that property in the selected section of winning numbers database.

The table below shows the odd/even ratio for the latest 30 draws in Expert Lotto 6/49 demo lottery:

Date	Numbers	Odd/Even
2010/28 Sun 2nd	23,29,36,42,44,47 [7]	3:3
2010/28 Sun 1st	6,13,14,19,41,42 [29]	3:3
2010/28 Wed 2nd	2,13,16,17,25,40 [27]	3:3
2010/28 Wed 1st	16,18,22,23,28,29 [24]	2:4
2010/27 Sun 2nd	1,6,12,24,32,41 [44]	2:4
2010/27 Sun 1st	2,15,22,29,30,37 [42]	3:3
2010/27 Wed 2nd	20,23,25,30,33,35 [7]	4:2
2010/27 Wed 1st	8,11,19,26,48,49 [18]	3:3
2010/26 Sun 2nd	8,11,18,32,36,38 [6]	1:5
2010/26 Sun 1st	5,6,11,31,40,43 [32]	4:2
2010/26 Wed 2nd	4,18,26,33,35,47 [11]	3:3
2010/26 Wed 1st	5,12,25,31,44,46 [33]	3:3
2010/25 Sun 2nd	10,15,28,30,36,43 [35]	2:4
2010/25 Sun 1st	16,21,24,25,35,46 [47]	3:3
2010/25 Wed 2nd	9,12,23,34,39,49 [24]	4:2
2010/25 Wed 1st	1,6,22,24,34,40 [33]	1:5
2010/24 Sun 2nd	8,12,23,31,37,49 [27]	4:2
2010/24 Sun 1st	11,19,28,29,32,39 [30]	4:2
2010/24 Wed 2nd	12,25,27,33,35,41 [20]	5:1

2010/24 Wed 1st	1,5,27,33,39,48 [36]	5:1
2010/23 Sun 2nd	1,12,24,33,38,42 [11]	2:4
2010/23 Sun 1st	3,13,14,19,23,48 [15]	4:2
2010/23 Wed 2nd	2,19,20,23,32,48 [24]	2:4
2010/23 Wed 1st	3,4,13,25,29,34 [37]	4:2
2010/22 Sun 2nd	4,7,8,23,25,28 [31]	3:3
2010/22 Sun 1st	3,13,19,27,31,44 [2]	5:1
2010/22 Wed 2nd	3,5,6,18,20,22 [48]	2:4
2010/22 Wed 1st	3,7,12,27,30,32 [1]	3:3
2010/21 Sun 2nd	3,9,11,20,23,43 [18]	5:1
2010/21 Sun 1st	1,12,20,23,30,34 [33]	2:4

Blue background highlights all draws with odd/even ratio *4:2*. You can see that this combination of odd/even numbers hasn't hit in the last 7 draws as its latest hit is from draw *2010/27 Wed 2nd*. The longest interval between two following hits of *4:2* is 5 draws, it happened between dates *2010/25 Wed 2nd* and *2010/26 Sun 1st*. The shortest draw interval between two hits is one draw, dates *2010/24 Sun 1st* and *2010/24 Sun 2nd*. The average count of draws between two following hits of odd/even combination *4:2* is *2.83*.

Statistical table in Analyzer window shows the information above in this form:

Odd/Even	Occurrence	[%]	Latest	AVG Interval	Min Interval	Max Interval	Due
0:6	134,596	0.96	n/a	n/a	n/a	n/a	n/a
1:5	1,062,600	7.60	9	7.00	7	7	1.29
2:4	3,187,800	22.80	4	4.33	1	8	0.92
3:3	4,655,200	33.29	1	3.00	1	11	0.33
4:2	3,491,400	24.97	7	2.83	1	5	2.47
5:1	1,275,120	9.12	19	3.33	1	6	5.70
6:0	177,100	1.27	n/a	n/a	n/a	n/a	n/a

- **Latest** - shows how many draws elapsed since the last hit of the given statistical property. Value 1 means that the statistical property was found in the latest draw.
- **AVG Interval** - the average count of draws between two following hits of the given statistical property.
- **Min Interval** - the lowest count of draws between two hits of the given statistical property.
- **Max Interval** - the highest count of draws between two hits of the given statistical property.
- **Due** - this columns gives a hint how likely it is - from statistical point of view - that a given property will hit in the next draw. *Due* values lower than 1 mean that the given property isn't expected in the next draw. *Due* values higher than 1 mean that the given property is long overdue and should hit in the next draw. Due values close to 1 mean that the given property is very close to its average hit cycle and should come up in the next draw.
  For example odd/even ratio *4:2* in the example above has an average draw interval of *2.83* draws. This combination of odd/even numbers is long overdue because it hasn't hit for 7 draws in a row. Therefore its *Due* value is *7 / 2.83 = 2.47*.

On the other hand, odd/even combination *3:3* has an average cycle of *3* draws and it came up in the very latest draw. Its *Due* value is *1 / 3 = 0.33* so it shouldn't be expected in the next draw.

Odd/even combination *2:4* hits approximately every *4* draws and it hasn't hit for 4 draws in a row. Its *Due* value is *4 / 4.33 = 0.92* so it is expected in the next draw as it is close to its average hit/skip cycle.

The draw interval data always apply to the selection of past winning numbers made in *Ticket Analyzer* window under option *Analyze intervals of past winning numbers draws*. The most common selection should be either several latest draw or the whole winning numbers database. It doesn't make much sense to analyze draw intervals of draws that have no relation to the latest draw in your winning numbers database. But for back-testing purposes you may want to exclude the very latest draw to verify your lottery strategy.

Note: The number of draws elapsed since the latest hit of a statistical property is excluded from the calculation of *AVG*, *Min* and *Max Intervals* since it isn't considered as an actual hit.

Note: Value *n/a* in statistical tables means that are not enough occurrences of the given statistical property in analyzed past draws to provide draw interval data.

Toolbar above statistical tables provides the following options:

- 0̶ - hides table rows where the *Occurrence* column shows value 0. It's useful especially for tables showing many rows, for example when analyzing triplets or quads.
- 🖌 - displays the complete history of draw intervals for selected table row. See below.
- 🖌Σ - exports draw intervals for all table rows into a text file or MS Excel sheet.
- 🔽 - opens Statistical Properties Filter window to accept/reject Package tickets that have the selected statistical property or properties. **Note:** This button is enabled only when the Package isn't empty.
- 🗐 - copies selected table rows to system clipboard.
- ➕ - if the current analyzer view shows pool numbers then this button adds selected table rows as a new ticket to the end of the current Package contents. **Note:** When playing for example 6/xx lottery then this button is enabled only when exactly 6 table rows are selected.

▶ You can select one or more table rows, click menu *Edit - Copy* and then switch to a complex filter window and press menu *Edit - Paste* to create a new Occurrences filter.

▶ Some Analyzer tables are connected to ticket filters. For example you can selected several rows in Ticket Numbers analyzer and then open Match Numbers ticket filter. You will see that the numbers highlighted in Analyzer table are automatically pre-selected in the filter window. So you can easily build a *Complex Filter* that accepts/rejects number with desired statistical properties (*Latest, AVG Interval, Due* etc). The following ticket filters support this feature:

Ticket Filter	Analyzer Table
Match Numbers	Ticket Numbers
Consecutive Pairs	Consecutive Pairs
Consecutive Triplets	Consecutive Triplets
Consecutive Quads	Consecutive Quads
First/Last Digits	Digits Per Ticket
Numbers at Positions	Ticket Positions
Digits at Positions	Positional First/Last Digits

Bonus Numbers	Bonus Numbers
Segment Combinations	Segment Combinations

Interval Details

To see the complete history of draw intervals for a selected statistical property, click button 🪝 at the top of *Analyzer* window. The draw interval details tables and chart are displayed at the bottom of *Analyzer* window:

Interval Sequence	Coefficient of variation: 0.333	Interval	Repeats
3		1	1
6		3	1
1		6	1
19			
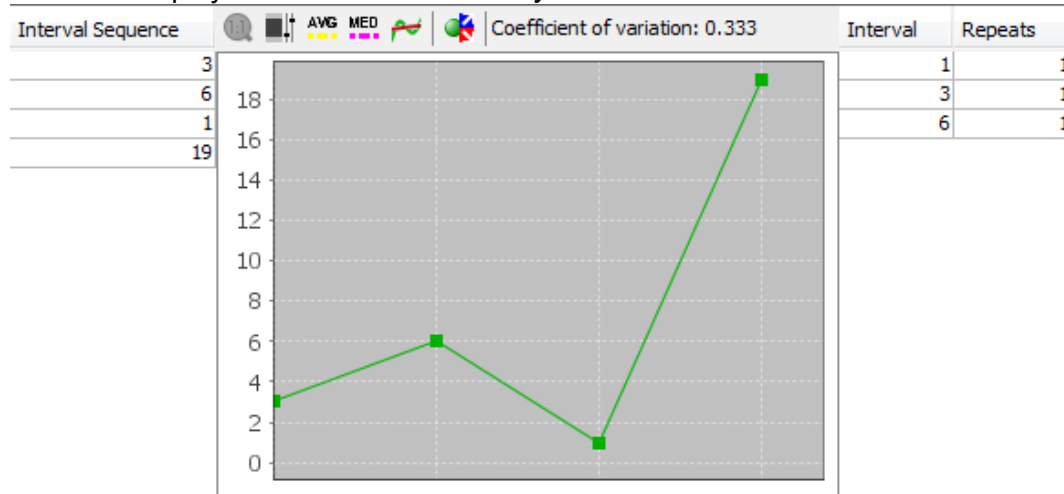
The screenshot above shows draw interval details for odd/even ratio *4:2* for the latest 30 draws in Expert Lotto 6/49 demo lottery. See also the tables above.

Interval Sequence table on the left-hand side shows how many draws elapsed between each hit of *4:2* odd/even ratio. The oldest intervals are at the top of the table, latest values are at the bottom of the table. As you can see from the table odd/even *4:2* hasn't hit for 7 latest draws, 3 draws elapsed between the latest hit and the previous hit of this odd/even ratio. Before that, *4:2* skipped 4 draws etc. Data in this table correspond to statistical properties table above. *Interval Sequence* table also shows that the minimum interval is 1 and maximum interval is 5 (the number of draws elapsed from the latest hit is excluded from min/max/avg interval calculation).

The same information is also available as a chart in the middle section where you can use various chart tools to estimate the probability that the given statistical property will hit in the next draw.

▶ You can toggle button 🎯 to run automated prediction of the next draw interval. The predicted value is then displayed in chart's toolbar.

▶ You can change the layout of split windows using menu *View - Split orientation*.

Coefficient of variation indicator in chart's toolbar shows the measure of dispersion of data in the chart. Read more details here.

The table on the right shows how many times each draw interval repeats. In the example above interval of 2 draws repeats two times. It is another hint when evaluating the statistics for the next draw: Draw intervals with high repeat counts are likely - from statistical point of view - to repeat again in the coming draws.

▶ You can sort the *Interval Repeats* table by clicking its column headers.

Statistical Charts

Summary statistics are also available as bar charts where it's easier to make a better mental picture how many analyzed tickets have a given statistical property.

Use the toolbar at the top of *Analyzer* window to customize the chart:

- **Zoom** - by default each chart shows the whole horizontal axis. You can zoom any part of the axis by clicking into the chart and dragging the mouse cursor to the right. To reset the zoom either click this button or click the chart window and drag the mouse to the left.
- **Range Tool** - toggles adjustable chart ranges. There are two sliders to the right of chart window highlighting a portion of the vertical axis when toggled on. Use your mouse to move the sliders, hold down *CTRL* key to move both sliders at the same time. Alternatively you can enter chart ranges directly from keyboard into the spinner fields at the top and at the bottom of the sliders. The range tool helps when evaluating how many statistical properties fall into highlighted area.
- **Average Value** - displays a horizontal line in the chart which denotes the average occurrence of the given statistical property in analyzed tickets.
- **Additional axis** - when a chart window shows more than one data set this button can be used to toggle the display of additional vertical axis.
- - Sorts the chart in ascending order.
- - Sorts the chart in descending order.
- - opens [Statistical Properties Filter](#) window to accept/reject Package tickets that have the selected statistical property or properties. **Note:** This button is enabled only when the Package isn't empty and chart ranges are showing.
- **More** - this button shows a popup menu where you can toggle additional bars to be displayed in the chart: *Latest*, *AVG Interval* and *Due*. So you can compare occurrences of each statistical property with e.g. *Due* values.

▶ Hover mouse cursor above any bar in the chart window to see a tooltip with detailed information for the corresponding statistical property.

▶ You can export any chart as a JPG or PNG image using menu *File - Export*.

Custom Analyzer

Custom Analyzer window provides another way of filter [back-testing](#). You can build a list of ticket filters in this window and apply the filters to past winning numbers draws. *Custom Analyzer* will then show summary statistics and detailed breakdown of accepted and rejected draws.

Custom Analyzers can be saved to a file on your disk and reopened on next application startup.

To create a new *Custom Analyzer*, click menu *File - New - Custom Analyzer*. To open an existing *Custom Analyzer* click menu *File - Open File* and select *Analyzer Files* in *Files of type* combo box at the bottom of file browser window that opens from that menu command.

▶ You can also drag and drop a custom analyzer file into the main application window to open that analyzer. *Custom Analyzer* files have *.analyzer* extension.

You can reuse *Custom Analyzers* in various lotteries installed on your computer. The following rules apply:

- If *lottery A* has the same number pool(s), the same count of numbers in each ticket and the same draw schedule as *lottery B* then *Custom Analyzers* created for *lottery A* can be opened, executed and modified in *lottery B* without any restrictions.

- If *lottery A* has the same draw schedule, the same count of numbers in each ticket and all number pools are the same or bigger than in *lottery B* then *Custom Analyzers* created for *lottery A* can be opened and executed in *lottery B*. However the analyzer will open as read-only in *lottery B* and you cannot modify its settings. For example when playing a 6/40 lottery then it is possible to open and execute a *Custom Analyzer* created for a 6/49 lottery.
- Expert Lotto will refuse to open a *Custom Analyzer* if the lottery it was originally created for is not compatible with the current lottery - because it has a different count of main or bonus numbers, it has a different draw schedule or its number pool is bigger than the original lottery. For example *Custom Analyzer* created for a 6/49 Jackpot lottery won't open in a *Pick 3* lottery and vice versa.

Custom Analyzer window has three different modes. You can switch between the modes by clicking at appropriate buttons at the top of the *Custom Analyzer* window.

- Design - in this mode you can add/remove filters and modify filter settings.
- Summary mode shows summary statistics of draws that ticket filters in the analyzer window accepted.
- Details mode lists selected past draws and shows which ticket filters accept a given draw.

Design

In *Design* mode you add and customize filters to your custom analyzer. The *Design* screen is divided into two parts. At the top there is *Name & Description* pane where you can enter the name and a short description of your custom analyzer. The pane is collapsible by clicking on its header. The lower part of the *Design* screen is the actual filter list.

▶ You can collapse *Name & Description* pane to maximize the screen area available for the filter list.

When creating a new *Custom Analyzer* its filter list is initially empty. To add a new filter to your custom analyzer, click button *Add filter* at the top-right corner of *Custom Analyzer* window. This opens Select Filter window listing all available filters. Select the filter you wish to add and click *Select* button. The filter is added to the custom analyzer and its settings are available at the lower part of filter list area. Repeat the same steps to add another filter to the custom analyzer.

Another way of adding a filter is using Filters window - simply drag the desired filter from *Filters* window and drop it into the *Custom Analyzer* window.

To customize the settings of any filter in the list, click the filter in the table first. The lower part of the *Designer* window then shows controls for the modification of the settings of the selected filter. Note that filter's description updates automatically in the *Description* column as you make changes to filter's settings.

▶ You can drag the divider between filters table and filter settings area to enlarge the upper or the lower part of the *Designer* window as needed.

If you wish to remove a filter from custom analyzer select the filter(s) using your mouse then press *Delete* key. You can also use menu *Edit - Delete*.

Note: The filters in the list are numbered in ascending order for better orientation in *Summary* and *Details* modes respectively.

Summary

Click *Summary* button at the top of *Custom Analyzer* window to see summary statistics of ticket filters:
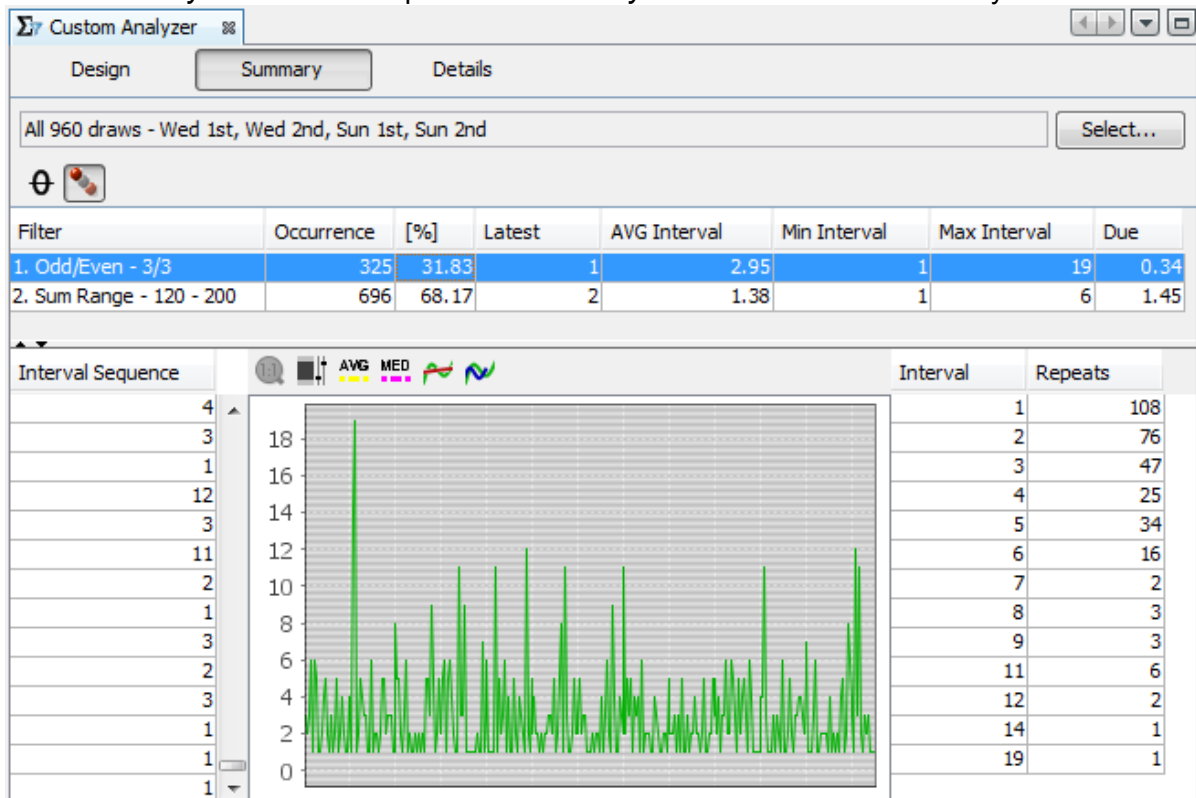
The screen shot above shows summary statistics of *Custom Analyzer* which contains two ticket filters:

1. Odd/Even filter which accepts tickets with 3 odd numbers and 3 even numbers.
2. Sum Range filter which accepts tickets whose sum of ticket numbers is in the range of 120 to 200.

The summary table is given for the whole winning numbers database in Expert Lotto 6/49 demo lottery. From the table you can see that *Odd/Even* filter accepts 325 past draws and *Sum Range* accepts 696 past draws.

The summary table has the same format as statistical tables in Analyzer window. You can click button 0 to hide rows with ticket filters that don't accepted any of the selected past draws. Clicking button shows draw intervals details for the selected ticket filter.

Click button *Select* to choose past draws the ticket filters will be applied to.

Details

Click *Details* button at the top of *Custom Analyzer* window to see a table of selected past draws showing which ticket filter(s) accept a given draw.

The first table column is draw date, the second table column are winning numbers of given draw. The rest of the table columns are ticket filters. A small **x** sign denotes that ticket filter accepts given draw while red background highlights draws rejected by the filter.

Note that column headers are too narrow to show full filter name and description so you should use index numbers in column headers to match the table columns with ticket filters in *Design* mode. You can also hover mouse cursor above any ticket filter column to see its full name and description.

Click button *Select* to choose past draws the ticket filters will be applied to.

▶ You can change the order of draws in the table by clicking *Date* column header.

▶ Use menu *Edit - Find* to search for a draw with given numbers.

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Ticket Properties

Menu command *Tools - Ticket Properties* opens *Ticket Properties* window which displays statistical properties of a single ticket or draw in currently active window:

1. Click menu *Tools - Ticket Properties* to open this window.
2. Click menu *Winning Numbers - Show As - Table*.
3. Click any draw in the Winning Numbers Table window - *Ticket Properties* window will show its statistical properties.
4. Click menu *Package - Show As - Table*.
5. If the Package is empty, click menu e.g. *Package - Insert - Random Numbers* to insert some tickets.
6. Click any ticket in Package Table window - *Ticket Properties* window will show its statistical properties.
7. Switch back to *Winning Numbers Table* window - *Ticket Properties* will again show the statistical properties of the selected draw.
8. Switching back to *Package Table* window makes the *Ticket Properties* window display the properties of the selected Package ticket.

This way you can display statistical properties of any ticket or draw selected in:

- Package Table window
- Package Matrix window
- Package Properties window
- Package Winnings window
- Winning Numbers Table window
- Winning Numbers Matrix window
- Winning Numbers Properties window
- Winning Numbers Charts window
- Complex Filter results table

▶ Column header in *Ticket Properties* window shows the winning numbers of the draw or the numbers of the Package ticket whose statistical properties are displayed in that window.

▶ You can customize the list of statistical properties using menu *Tools - Options - Statistics*.

Note: Some statistical properties are organized into categories. Double-click appropriate table row to expand or collapse that category.

Summary Statistics

Summary statistics provide an overview how many analyzed tickets or draws have given statistical property. For example when analyzing the ratio of odd and even numbers in a 6/49 lottery then the results for all possible combinations show the following:

Odd/Even	Ticket Count
0:6	134596
1:5	1062600
2:4	3187800
3:3	4655200
4:2	3491400
5:1	1275120
6:0	177100

The most common combination of odd and even numbers is 3:3. There are 4,655,200 such tickets in the full wheel of all possible combinations. So from the statistical point of view it should be safe to prefer tickets with this ratio of odd/even numbers when preparing your bet for the next draw.

The same information is available as a bar chart:
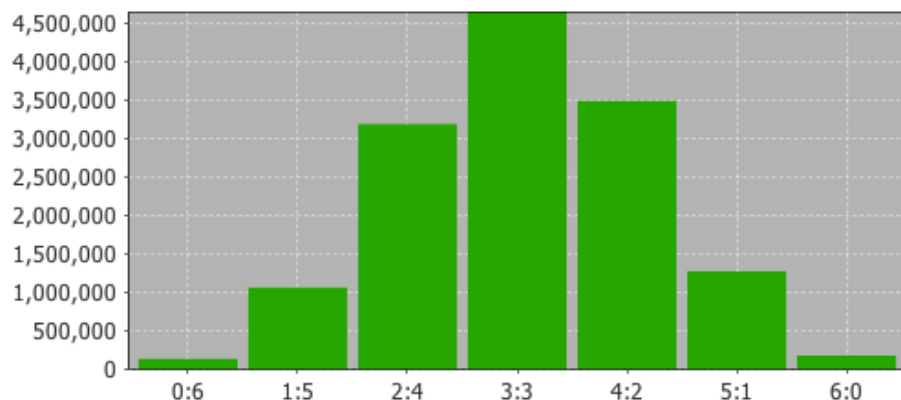
There are many types of summary statistics available in Expert Lotto and most of them have complementary ticket filter to reduce the tickets according to their statistical properties.

To calculate summary statistics, click menu *File - New - Analyzer*.

See also Statistical Properties.

Ticket Numbers

These statistics track the occurrences of pool number in analyzed tickets.

For example the analysis of *Ticket Numbers* for 10 latest draws in Expert Lotto 6/49 Demo lottery shows that the most frequent numbers are 32, 36, 40, 41 and 42. Each number occurs twice in the analyzed ten draws. On the other hand the analyzed draws do not contains numbers 3, 4, 7, 9, 10, 21, 27, 34, 39, 45 and 46. The analyzer table shows zero in *Occurrence* column for these numbers.

▶ When playing e.g. 6/xx lottery you can select six table rows (i.e. six pool numbers) and then click ✚ button in the toolbar to add the selected numbers as a new ticket into the Package.

See also Match Numbers ticket filter.

Bonus Numbers

Bonus numbers analysis shows the frequency of bonus or powerball numbers.

For example the latest 10 draws in Expert Lotto 6/49 Demo Lottery are:

2010/28 Sun 2nd	23	29	36	42	44	47	[07]
2010/28 Sun 1st	06	13	14	19	41	42	[29]
2010/28 Wed 2nd	02	13	16	17	25	40	[27]
2010/28 Wed 1st	16	18	22	23	28	29	[24]
2010/27 Sun 2nd	01	06	12	24	32	41	[44]
2010/27 Sun 1st	02	15	22	29	30	37	[42]
2010/27 Wed 2nd	20	23	25	30	33	35	[07]
2010/27 Wed 1st	08	11	19	26	48	49	[18]
2010/26 Sun 2nd	08	11	18	32	36	38	[06]
2010/26 Sun 1st	05	06	11	31	40	43	[32]

So the analyzer table shows occurrence value of 2 for bonus number 7 as it appear two times in the last 10 draws.

See also Bonus Numbers ticket filter.

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Mixed Pool Numbers

This statistical analyzer is available only when playing a Pick-N lottery where each winning number comes from a separate pool. It tracks the occurrences of numbers in analyzed tickets regardless of the pool they come from.

For example the analysis of *Mixed Pool Numbers* for 10 latest draws in Expert Lotto Pick 3 Demo lottery shows that for example number 0 came up twice - in the first position in draw 21.7.2010 and in draw 12.7.2010 (also in the first position). The most frequent number is 9 occurring five times in positions 1, 2 and 3. The least frequent numbers are 4 and 8.

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Bonus Pairs

Bonus numbers analysis shows the frequency of pairs of bonus or powerball numbers in analyzed tickets/draws.
Note: These statistics are available only in lotteries that draw two or more bonus/powerball numbers.
See also Bonus Numbers statistics.

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Odd/Even

These statistics track the occurrences of odd and even numbers in analyzed tickets.
These statistics are available in summary form and also as per-ticket properties.
See also Odd/Even ticket filter.

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Low/High

These statistics track the occurrences of low and high numbers in analyzed tickets.
Number is low when it is in the lower half of number pool, number is high when it is in the upper half of number pool.
For example in a x/40 lottery, numbers 1 to 20 are low, numbers 21 to 40 are high numbers. In a x/49 lottery, numbers 1 to 24 are low, numbers 25 to 49 are high.
These statistics are available in summary form and also as per-ticket properties.
See also Low/High ticket filter.

Sum Statistics

Ticket Sum

Ticket sum statistics track the occurrence of the sum main numbers in analyzed tickets. For example the winning numbers in the latest draw of Expert Lotto 6/49 Demo Lottery are 23-29-36-42-44-47-[07]. So the sum value for that draw is *23+29+36+42+44+47=221*.

Sum Root

Sum root is a single digit number ranging from 1 to 9. It is calculated from arithmetic sum of ticket's main numbers by repeatedly summing the digits of the sum value until only a single digit number is left. For example the sum of ticket 11-22-32-35-46-48 is 194. So the *Sum Root* value is *1+9+4=14 -> 1+4=5*.

If you analyze the whole list of all possible number combinations you will see that the Sum Root statistics divides the analyzed tickets into nine evenly-sized groups.

Odd/Even Numbers Sum

This is sum of odd or even numbers of the analyzed ticket. For example the winning numbers in the latest draw of Expert Lotto 6/49 Demo Lottery are 23-29-36-42-44-47-[07]. So the sum of odd numbers is *23+29 +47=99*. Sum of even numbers is *36 + 42 + 44 = 122*.

Low/High Numbers Sum

This is sum of low or high numbers of the analyzed ticket. For example the winning numbers in the latest draw of Expert Lotto 6/49 Demo Lottery are 23-29-36-42-44-47-[07]. So the sum of low numbers is *23* because that is the only low number in that draw. Sum of high numbers is *29 + 36 + 42 + 44 + 47 = 198*.

Odd/Even Numbers Sum Root

This is *sum root* of ticket's odd or even numbers. For example the winning numbers in the latest draw of Expert Lotto 6/49 Demo Lottery are 23-29-36-42-44-47-[07]. Sum of even numbers is *36 + 42 + 44 = 122*. The *root* of that sum is *1+2+2=5*.

Low/High Numbers Sum Root

This is sum root of ticket's low or high numbers. For example the winning numbers in the latest draw of Expert Lotto 6/49 Demo Lottery are 23-29-36-42-44-47-[07]. So the sum of low numbers is *23* because that is the only low number in that draw. The *root* of that sum is *2+3=5*. Sum of high numbers is *29 + 36 + 42 + 44 + 47 = 198*. And the *root* of that sum is *1+9+8=18 -> 1+8=9*.

Sum's Last Digit

This is the least significant (last) digit of the value of the sum of analyzed ticket numbers. So if the sum of winning numbers of the latest draw in Expert Lotto 6/49 Demo lottery is 221 (see above), then its last digit is *1*. Similar to *Sum Root* this statistics divides the full set of all possible number combinations into ten evenly sized groups.

First Digits Sum

This is the sum of all first digits of the analyzed ticket. For example the winning numbers in the latest draw of Expert Lotto 6/49 Demo Lottery are 23-29-36-42-44-47-[07]. So the first digits are 2, 2, 3, 4, 4, 4 and their sum is *19*.

Last Digits Sum

This is the sum of all last digits of the analyzed ticket. For example the winning numbers in the latest draw of Expert Lotto 6/49 Demo Lottery are 23-29-36-42-44-47-[07]. So the last digits are 3, 9, 6, 2, 4, 7 and their sum is *31*.

All Digits Sum

This is the sum of all first and last digits of the analyzed ticket. For example the winning numbers in the latest draw of Expert Lotto 6/49 Demo Lottery are 23-29-36-42-44-47-[07]. The sum of the first digits is 19, the sum of last digits is 31 so the sum of all digits is 19+31=*50*.

First Digits Sum Root

This is the sum root of all first digits of the analyzed ticket. For example the winning numbers in the latest draw of Expert Lotto 6/49 Demo Lottery are 23-29-36-42-44-47-[07]. So the first digits are 2, 2, 3, 4, 4, 4 and their sum is 19 with root value of *1*.

Last Digits Sum Root

This is the sum root of all last digits of the analyzed ticket. For example the winning numbers in the latest draw of Expert Lotto 6/49 Demo Lottery are 23-29-36-42-44-47-[07]. So the last digits are 3, 9, 6, 2, 4, 7 and their sum is 31 with root value of *4*.

Bonuses Sum

If the lottery draws two or more bonus numbers then this is the sum of all bonus numbers. If the the lottery has just one or no bonus number then these statistics are not available.

All these statistics are available in summary form and also as per-ticket properties.

See also Sum Range, Sum Root, Sum of Odd/Even Numbers, Sum of Low/High Numbers and Sum's Last Digit ticket filters.

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Repeating Numbers

These statistics track how many analyzed ticket numbers repeat from previous draws. The statistics show the count numbers repeating from *1, 3, 5* and *10* previous draws.

For example the latest 10 draws in Expert Lotto 6/49 Demo Lottery are:

| 2010/28 Sun 2nd | 23 | 29 | 36 | 42 | 44 | 47 | [07] |

2010/28 Sun 1st	06	13	14	19	41	42	[29]
2010/28 Wed 2nd	02	13	16	17	25	40	[27]
2010/28 Wed 1st	16	18	22	23	28	29	[24]
2010/27 Sun 2nd	01	06	12	24	32	41	[44]
2010/27 Sun 1st	02	15	22	29	30	37	[42]
2010/27 Wed 2nd	20	23	25	30	33	35	[07]
2010/27 Wed 1st	08	11	19	26	48	49	[18]
2010/26 Sun 2nd	08	11	18	32	36	38	[06]
2010/26 Sun 1st	05	06	11	31	40	43	[32]

When analyzing the latest draw *2010/28 Sun 2nd* we can see that one number repeats from the previous draw. It's number 42. So the column *Repeating Numbers [1]* in e.g. Winning Numbers Properties window shows value of 1 for this draw.

When comparing the latest draw with three previous draws, we can see that 3 numbers repeat. Number 42 from previous draw and numbers 23 and 29 from draw *2010/28 Wed 1st* (see numbers with blue background in the table above). Therefore the column *Repeating Numbers [3]* shows value of 3 for this draw.

Comparing the latest draw with 5 previous draws shows that only the same three numbers repeat. So column *Repeating Numbers [5]* also shows value of 3.

Looking at 10 previous draw we can see there are 5 repeating numbers: 42 from draw *2010/28 Sun 1st*, 23 and 29 from draw *2010/28 Wed 1st*, 36 from draw *2010/26 Sun 2nd* and 47 from draw *2010/26 Wed 2nd*. Therefore the column *Repeating Numbers [10]* shows value of 5 for this draw.

Note: *Repeating Numbers* properties of Package tickets apply to the selection of past winning numbers made in Options window.

These statistics are available in summary form and also as per-ticket properties.

See also Repeating Numbers ticket filter.

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Adjacent Numbers

Adjacent numbers are numbers that are one higher or one lower than the winning numbers from the previous draw.

There are two types of Adjacent Numbers statistics. Per ticket statistics compares ticket numbers with previously drawn numbers at any ticket position. Per position statistics compares the ticket numbers at the same ticket position only.

Additional categorization is the distance between adjacent numbers. The distance ranges from 1 to 5. It means *Adjacent Numbers [1]* are numbers that are one higher or one lower then previous winning numbers. *Adjacent Numbers [2]* are numbers that are two higher or two lower then previous winning numbers. For example number 15 is *adjacent [2]* to numbers 13 and 17 respectively. The same applies to *Adjacent Numbers [3]*, *[4]* and *[5]* respectively. For example number 31 is *adjacent [5]* to numbers 26 and 36 respectively.

Adjacent Numbers Per Ticket

For example the latest 10 draws in Expert Lotto 6/49 Demo Lottery are:

2010/28 Sun 2nd	23	29	36	42	44	47	[07]
2010/28 Sun 1st	06	13	14	19	41	42	[29]
2010/28 Wed 2nd	02	13	16	17	25	40	[27]
2010/28 Wed 1st	16	18	22	23	28	29	[24]
2010/27 Sun 2nd	01	06	12	24	32	41	[44]
2010/27 Sun 1st	02	15	22	29	30	37	[42]
2010/27 Wed 2nd	20	23	25	30	33	35	[07]
2010/27 Wed 1st	08	11	19	26	48	49	[18]
2010/26 Sun 2nd	08	11	18	32	36	38	[06]
2010/26 Sun 1st	05	06	11	31	40	43	[32]

In the latest draw *2010/28 Sun 2nd* there is only one number adjacent to the numbers of previous draw *2010/28 Sun 1st* - number **42** is adjacent to number **41** in the previous draw.
Draw *2010/28 Sun 1st* has two adjacent numbers - **14** and **41** which are adjacent to numbers **13** and **40** respectively.
Draw *2010/28 Wed 2nd* has only one adjacent number - **17** which is adjacent both to number **16** and to number **18** from the previous draw.
In total there are 7 cases of a single adjacent number and three draws have two numbers adjacent to numbers from previous draw. Adjacent numbers are highlighted with blue background in the table above.

When looking for *adjacent numbers [4]*, we can see that for example draw *2010/28 Wed 1st* has two such numbers. Number 16 is adjacent [4] to number 12 and number 28 is adjacent [4] to number 24 from previous draw. Highlighted with red background in the table above.

Adjacent Numbers Per Position

2010/28 Sun 2nd	23	29	36	42	44	47	[07]
2010/28 Sun 1st	06	13	14	19	41	42	[29]
2010/28 Wed 2nd	02	13	16	17	25	40	[27]
2010/28 Wed 1st	16	18	22	23	28	29	[24]
2010/27 Sun 2nd	01	06	12	24	32	41	[44]
2010/27 Sun 1st	02	15	22	29	30	37	[42]
2010/27 Wed 2nd	20	23	25	30	33	35	[07]
2010/27 Wed 1st	08	11	19	26	48	49	[18]
2010/26 Sun 2nd	08	11	18	32	36	38	[06]
2010/26 Sun 1st	05	06	11	31	40	43	[32]

Blue background in the table above highlights adjacent numbers [1] when comparing by ticket position. When looking for adjacent numbers [5], we can find two such numbers in e.g. draw *2010/26 Sun 2nd*. Number 11 is adjacent [5] to number 6 from previous and number 38 is adjacent to previous number 43 at the same position in previous draw. The numbers are highlighted with red background in the table above.

These statistics are available in summary form and also as per-ticket properties.

See also Adjacent Numbers filter.

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Adjacent Digits

Adjacent digits are first or last digits that are one higher or one lower than the appropriate digits from previous draw. Each pool number breaks down into two digits. The *first digit* is the leading digit of the number, the *last digit* is the second digit of the number. For example the first digit of number 23 is 2, the last digit of that number is 3. The first digit of number 9 is 0, the last digit of that number is 9.

There are two types of Adjacent Digits statistics. Per ticket statistics compares first/last digits with first/last digits at any position in the previous draw. Per position statistics compares the digits at the same ticket position only.

Adjacent Digits Per Ticket

For example the latest 2 draws in Expert Lotto 6/49 Demo Lottery are:

| 2010/28 Sun 2nd | 23 | 29 | 36 | 42 | 44 | 47 | [07] |
| 2010/28 Sun 1st | 06 | 13 | 14 | 19 | 41 | 42 | [29] |

There are four last digits in draw *2010/28 Sun 2nd* that are adjacent to previous draw *2010/28 Sun 1st*. Last digit 3 of number 23 is adjacent to previous numbers 14 and 42 (last digitis 4 and 2). Last digit of number 42 is adjacent to previous numbers 13 and 41 (last digits 3 and 1). Last digit 4 of number 44 is adjacent to previous number 13 (last digit 3). Last digit 7 of number 47 is adjacent to number 6 (last digit 6).

Adjacent Digits Per Position

When comparing the same two draws listed above per ticket positions, we can see that there no adjacent last digits. Only one first digit is adjacent to the first digits from previous draw at the same ticket position. The first digit of number 29 is 2 which is adjacent to the first digit 1 of number 13 from the previous draw at the same ticket position.

These statistics are available in summary form and also as per-ticket properties.

See also Adjacent Digits filter.

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Combined Statistics

With combined statistics it is possible to group up to five different statistics into a new, single statistical property and thus track the combination of statistical properties as a single event. Expert Lotto ships with three predefined combined statistics:

- Odd/Even + Low/High
- Sum Root + Odd/Even
- Sum Root + Low/High

Use menu *Tools - Options - Statistics* to define new combined statistics or to customize the existing ones.

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Odd/Even + Low/High

These statistics track the occurrence of combinations of *odd/even* numbers and *low/high* numbers.

Example

Ticket *1-2-3-4-5-6* has 3 odd numbers and 3 even numbers. All its numbers are low. So the *Odd/Even + Low/High* column in e.g. Package Properties window shows value *3:3 - 6:0* for this ticket.

The latest winning numbers in Expert Lotto 6/49 Demo Lottery are *23-29-36-42-44-47*-[07]. Three numbers are odd and three numbers are even, 1 number is low (23) and five numbers are high. So the *Odd/Even + Low/High* column in e.g. Winning Numbers Properties window shows value *3:3 - 1:5* for this draw.

These statistics are available in summary form and also as per-ticket properties.

See also Combined Statistics and Odd/Even and Low/High ticket filters.

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Sum Root + Odd/Even

These statistics track the occurrence of combinations of sum root values and odd/even numbers.

Example

The sum of ticket numbers 1-2-3-4-5-6 is 27. Sum root value is then 2+7=9. Three numbers are odd and three numbers are even. So the *Sum Root + Odd/Even* column in e.g. Package Properties window shows value *7 - 3:3* for this ticket.

The latest winning numbers in Expert Lotto 6/49 Demo Lottery are 23-29-36-42-44-47-[07]. The sum of these numbers is 221 therefore the sum root value is 2+2+1 = 5. Three numbers are odd and three numbers are even. So the *Sum Root + Odd/Even* column in e.g. Winning Numbers Properties window shows value *5 - 3:3* for this draw.

These statistics are available in summary form and also as per-ticket properties.

See also Combined Statistics and Sum Root and Odd/Even ticket filters.

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Sum Root + Low/High

These statistics track the occurrence of combinations of *sum root* values and *low/high numbers*.

Example

The sum of ticket numbers 1-2-3-4-5-6 is 27. Sum root value is then 2+7=9. All the numbers are low. So the *Sum Root + Low/High* column in e.g. Package Properties window shows value *7 - 6:0* for this ticket.

The latest winning numbers in Expert Lotto 6/49 Demo Lottery are 23-29-36-42-44-47-[07]. The sum of these numbers is 221 therefore the sum root value is 2+2+1 = 5. One number is low (23) and five numbers are high. So the *Sum Root + Low/High* column in e.g. Winning Numbers Properties window shows value *5 - 1:5* for this draw.

These statistics are available in summary form and also as per-ticket properties.

See also Combined Statistics and Sum Root and Low/High ticket filters.

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Match Previous Draws

These statistics show the best match of the analyzed ticket that was found in *5*, *10* and *15* latest draws.

For example the latest 10 draws in Expert Lotto 6/49 Demo Lottery are:

2010/28 Sun 2nd	**23**	**29**	36	42	44	47	[07]
2010/28 Sun 1st	06	13	14	19	41	42	[29]
2010/28 Wed 2nd	02	13	16	17	25	40	[27]
2010/28 Wed 1st	16	18	22	**23**	28	**29**	[24]
2010/27 Sun 2nd	01	06	12	24	32	41	[44]
2010/27 Sun 1st	02	15	22	29	30	37	[42]
2010/27 Wed 2nd	20	23	25	30	33	35	[07]
2010/27 Wed 1st	08	11	19	26	48	49	[18]
2010/26 Sun 2nd	08	11	18	32	36	38	[06]
2010/26 Sun 1st	05	06	11	31	40	43	[32]

When the latest draw *2010/28 Sun 2nd* (orange background) is compared to 5 previous draws (blue background) then the best match found is two numbers. Numbers *23* and *29* in the latest draw repeat in draw *2010/28 Wed 1st*. So the table cell in column *Match Previous 5* in [Winning Numbers Properties](#)window shows value of 2 for the latest draw.

When calculating the same property for draw *2010/28 Wed 2nd* then its winning numbers are compared with draws *2010/28 Wed 1st* to *2010/27 Wed 1st* and the best match found is just one number. For example number *16* from the previous draw or number *2* from draw *2010/27 Sun 1st*. So the table cell in column *Match Previous 5* in *Winning Numbers Properties* window shows value of 1 for this draw.

Column *Match Previous 10* shows the best match found in ten previous draws and column *Match Previous 15* shows the best match found in fifteen previous draws.

Note: The corresponding values in [Package Properties](#)window apply to the selection of past winning numbers made in [Options](#) window.

These statistics are available in [summary](#) form and also as per-ticket [properties](#).

See also [Match Winning Numbers](#) and [Highest Match](#) ticket filters.

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Ticket Panel

These statistics show the maximum count of numbers each analyzed ticket or draw has in ticket panel's row and in ticket panel's column.

For example when analyzing the latest draw in Expert Lotto 6/49 Demo Lottery with winning numbers 23-29-36-42-44-47-[7] then column *Max In Row* in e.g. Winning Numbers Properties window shows value 2 because there are at most two numbers at any row in Ticket Panel window. Column *Max In Column* in the same window shows value 2 because there are at most two numbers in any column in *Ticket Panel* window.

These statistics are available in summary form and also as per-ticket properties.

See also Ticket Panel filter.

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Consecutive Draws

This statistics count how many consecutive draws each pool numbers appear in.

For example the last 10 draws in Expert Lotto 6/49 Demo Lottery are:

2010/28 Sun 2nd	23	29	36	**42**	44	47	[07]
2010/28 Sun 1st	06	**13**	14	19	41	**42**	[29]
2010/28 Wed 2nd	02	**13**	**16**	17	25	40	[27]
2010/28 Wed 1st	**16**	18	22	23	28	29	[24]
2010/27 Sun 2nd	01	06	12	24	32	41	[44]
2010/27 Sun 1st	02	15	22	29	**30**	37	[42]
2010/27 Wed 2nd	20	23	25	**30**	33	35	[07]
2010/27 Wed 1st	**08**	**11**	19	26	48	49	[18]
2010/26 Sun 2nd	**08**	**11**	18	32	36	38	[06]
2010/26 Sun 1st	05	06	**11**	31	40	43	[32]

The table above shows that number 8 hit in two consecutive rows (*2010/26 Sun 2nd* and *2010/27 Wed 1st*), so the analyzer table for *Consecutive Draws* shows value 1 in column 2 for number 8.
Number 11 hit in three draws in a row (see numbers in bold in the table above) so the analyzer table for *Consecutive Draws* shows values 1 in column 3 for number 11.
Also numbers 13, 16, 30 and 42 hit in two consecutive draws to the analyzer table shows value 1 in column 2 in corresponding rows. Other table cells are empty because no other number hit again in the following draw in the selected section of winning numbers database.

When analyzing the whole winning numbers database of Expert Lotto 6/49 Demo Lottery you can see that the most repeating numbers is 17 which hit in six draws in a row. It happened in draws *2008/5 Sun 1st* to *2008/6 Sun 2nd*.

Number Matrix

These statistics track how many times each pool number was drawn with other pool numbers. It is very similar to Pairs analysis except that the results are presented as a number grid instead.

Let's analyze 10 latest draws in Expert Lotto 6/49 Demo Lottery:

2010/28 Sun 2nd	23	29	36	42	44	47	[07]
2010/28 Sun 1st	06	13	14	19	41	42	[29]
2010/28 Wed 2nd	02	13	16	17	25	40	[27]
2010/28 Wed 1st	16	18	22	23	28	29	[24]
2010/27 Sun 2nd	01	06	12	24	32	41	[44]
2010/27 Sun 1st	02	15	22	29	30	37	[42]
2010/27 Wed 2nd	20	23	25	30	33	35	[07]
2010/27 Wed 1st	08	11	19	26	48	49	[18]
2010/26 Sun 2nd	08	11	18	32	36	38	[06]
2010/26 Sun 1st	05	06	11	31	40	43	[32]

Number Matrix

Both row headers and column headers in this table are pool numbers. Values in appropriate table cells show how many times the given number was drawn with the other number. For example row 6 and column 41 show value of 2 which means that number 6 hit together with number 41 in two draws (*2010/28 Sun 1st* and *2010/27 Sun 2nd* - see blue cells in the table above). Table cell in row 41 and column 6 has the same meaning.
Table cell under row 1 and column 2 shows value zero which means that numbers 1 and 2 have never been drawn together in the analyzed 10 draws.

Latest Draws

Both row headers and column headers in this table are pool numbers. Table cell values show how many draws elapsed since the given numbers have been drawn together. For example row 6 and column 1 shows value of 5 which means that numbers 1 and 6 were drawn together five draws ago (draw *2010/27 Sun 2nd*). Table cell at coordinates 23 and 29 shows value 1 which means that numbers 23 and 29 were drawn together at the very latest draw. The same meaning has cell at coordinates 29 and 23.

Inverted Matrix

The cells in this table contain all possible number pairs. Column headers show how many times the pairs in given column were found in analyzed draws. Number pairs in column 0 have never been drawn in analyzed draws, pairs in column 1 hit just once in analyzed draws, pairs in column 2 hit twice etc. So this table is basically an inversion of *Number Matrix* table.

You can toggle *Column Range* button and then choose to display only a selected column range using *Min* and *Max* spinner fields.

Inverted Latest Draws

The cells in this table contain all possible number pairs. Column headers show how many draws elapsed since the last occurrence of the pairs in given column. Number pairs in column *n/a* have never been drawn, pairs in column 1 hit in the very latest draw, pairs in column 2 hit two draws ago etc. So this table is basically an inversion of *Latest Draws* table.

You can toggle *Column Range* button and then choose to display only a selected column range using *Min* and *Max* spinner fields.

▶ Click any column header in any table to sort it in ascending or descending order.

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Knight's Move

Knight's Move statistics compare the winning numbers of analyzed draw/ticket with the winning numbers from the previous draw. The statistics then show how many numbers from the previous draw made chess-like knight's move into the analyzed draw. Knight's move is defined as follows:

Let's arrange all pool numbers into a grid with 10 columns:

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	

As you can see, number 1 can make L-shaped knight's move to numbers 13 or 22 respectively. For example number 28 can jump to numbers 7, 9, 16, 20, 36, 40, 47, 49 - highlighted with blue background in the table above. The same rules apply to other pool numbers.

The statistics are given for the whole analyzed ticket and also per-position when the analyzed numbers are compared with previously drawn numbers at the same ticket positions.

Let's look at the following two draws in Expert Lotto 6/49 Demo lottery:

2010/28 Wed 1st	16	18	22	23	28	29	[24]

`2010/27 Sun 2nd` `01` `06` `12` `24` `32` `41` `[44]`

Per-ticket Knight's Move statistics for draw *2010/28 Wed 1st* show that there 3 numbers that knight-moved from the previous draw. Number 24 from previous draw jumped to number 16 in the analyzed draw. Number 6 made L-shaped move to number 18 and number 41 jumped to number 22.

When we compare the numbers at the same ticket positions then there's only number 6 at the second ticket position which jumped to number 18 at the same ticket position.

These statistics are available in summary form and also as per-ticket properties.

See also Knight's Move filter.

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Ticket Index Range

Ticket index is a number which uniquely identifies the ticket in the set of all possible number combinations. For example in 6/49 lottery, the ticket index 1 is equal to number combination 1-2-3-4-5-6, ticket index 2 equals to number combination 1-2-3-4-5-7, ticket index 3 is number combination 1-2-3-4-5-8 etc. Ticket numbers 44-45-46-47-48-49 have ticket index of 13,983,816.

Ticket Index Range statistics divide the whole interval of all possible ticket index values into several ranges. Each row in the analyzer table represents one ticket index range. The summary statistics then show how many analyzed tickets fall into each ticket index range.

- **100k** - The list of all possible ticket index values is divided into several chunks. Each chunk has 100,000 indexes. The first range includes ticket indexes from 1 to 100,000, the second range are indexes from 100,001 to 200,000, the next range are indexes from 200,001 to 300,000 etc. The count of table rows depends on how many combinations can be created for the given lottery.
- **[10]** - the whole range of ticket indexes is divided into ten equally sized parts. The first column in the table shows the range number and the second number in square brackets shows the ending ticket index within the given range.
- **[20]** - the whole range of ticket indexes is divided into twenty equally sized parts. The first column in the table shows the range number and the second number in square brackets shows the ending ticket index within the given range.
- **[50]** - the whole range of ticket indexes is divided into fifty equally sized parts. The first column in the table shows the range number and the second number in square brackets shows the ending ticket index within the given range.
- **[100]** - the whole range of ticket indexes is divided into one hundred equally sized parts. The first column in the table shows the range number and the second number in square brackets shows the ending ticket index within the given range.
- **[1000]** - the whole range of ticket indexes is divided into one thousand equally sized parts. The first column in the table shows the range number and the second number in square brackets shows the ending ticket index within the given range.

See also Ticket Index Range filter.

Ticket Index Movement

This summary statistics shows the relative distance of analyzed ticket from the latest draw (when analyzing Package tickets) or from the previous draw (when analyzing winning numbers draws) in the full list of all possible combinations.

For example in a 6/49 lottery there are 13,983,816 possible combinations starting with number combination 1-2-3-4-5-6 which has ticket index 1, then number combination 1-2-3-4-5-7 which has ticket index 2, up to the last possible combination 44-45-46-47-48-49 which has ticket index 13,983,816.

Ticket index movement than compares the index of the latest draw (or the index of previous draw) with the index of the analyzed ticket. The lowest possible value is 0.0 which means that the analyzed ticket has the same numbers as the latest/previous draw. The highest possible value is 0.999999999. This happens only if the analyzed ticket numbers are 1-2-3-4-5-6 and the latest winning numbers are 44-45-46-47-48-49 or vice versa.

The statistical table divides the whole possible range of ticket index movement values into 100 equal sub-ranges. The first table row shows how many analyzed tickets/draws fit into ticket index movement range 0.0 to 0.01 (exclusive), the second row shows the occurrence of ticket index movement in the range 0.01 (inclusive) to 0.02 (exclusive) etc.

See also Ticket Index Movement filter and Ticket Index Movement statistical property.

Ticket Index Positions

Ticket index is a number which uniquely identifies the ticket in the set of all possible number combinations. For example in 6/49 lottery, the ticket index 1 is equal to number combination 1-2-3-4-5-6, ticket index 2 equals to number combination 1-2-3-4-5-7, ticket index 3 is number combination 1-2-3-4-5-8 etc. Ticket numbers 44-45-46-47-48-49 have ticket index of 13,983,816.

That means there are 8 different positions. Positions of ticket index value of 1 are *0, 0, 0, 0, 0, 0, 0 and 1* and positions in ticket index 13,983,816 are *1,3,9,8,3,8,1 and 6*.

The statistics then show how many times a digit 0 to 9 appears at individual ticket index positions.

These statistics are available in summary form and also as per-ticket properties.

See also Ticket Index Position filter.

Prime Numbers

These statistics give the count of prime numbers in analyzed tickets.

Prime numbers in the range of 1 to 100 are *2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47, 53, 59, 61, 67, 71, 73, 79, 83, 89, 97*

These statistics are available in summary form and also as per-ticket properties.

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Arithmetic Complexity

Arithmetic complexity shows the variations of differences between the numbers of analyzed tickets. The formulae is:

Arithmetic Complexity(t) = D(t) - (r-1)

where *D(t)* is the count of unique differences between all ticket numbers and *r* is the count of numbers in the analyzed ticket.

In a 6/xx lottery the Arithmetic Complexity value ranges from 0 to 10. About 74% of all possible combinations have the Arithmetic Complexity value in the range of 8 to 10.

Example

Let's analyze ticket 1-2-3-4-5-6. The differences between all ticket numbers are:

2-1 = 1
3-1 = 2
4-1 = 3
5-1 = 4
6-1 = 5
3-2 = 1
4-2 = 2
5-2 = 3
6-2 = 4
4-3 = 1
5-3 = 2
6-3 = 3

5-4 = 1
6-4 = 2
6-5 = 1

There are 5 unique differences: 1, 2, 3, 4, 5 so the Arithmetic Complexity of this ticket is 5-(6-1) = 0

The same analysis of ticket 1-2-4-8-13-21 shows the following differences:

2-1 = 1
4-1 = 3
8-1 = 7
13-1 = 12
21-1 = 20
4-2 = 2
8-2 = 6
13-2 = 11
21-2 = 19
8-4 = 4
13-4 = 9
21-4 = 17
13-8 = 5
21-8 = 13
21-13 = 8

None of the differences above repeat so there are 15 unique differences so the Arithmetic Complexity of this ticket is 15-(6-1)=10

These statistics are available in summary form and also as per-ticket properties.

See also Arithmetic Complexity filter.

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Consecutive First/Last Digits In Any Order

This statistics gives the maximum count of first and last digits that are consecutive regardless of their order within the analyzed tickets.

Each pool number breaks down into two digits. The *first digit* is the leading digit of the number, the *last digit* is the second digit of the number. For example the first digit of number 23 is 2, the last digit of that number is 3. The first digit of number 9 is 0, the last digit of that number is 9.

For example the latest draw in Expert Lotto 6/49 Demo lottery is 23-29-36-42-44-47. The first digits of that draw are 2, 2, 3, 4, 4, 4. The longest sequence of consecutive digits is 2-3-4 so the value of *Consecutive First Digits (any order)* for the latest draw is *3*.

The last digits of the latest draw are 3, 9, 6, 2, 4, 7. When sorted in ascending order the last digits are 2, 3, 4, 6, 7, 9. We can see that the longest consecutive sequence is 2-3-4 so the value of *Consecutive Last Digits (any order)* for the latest draw is *3*.

These statistics are available in summary form and also as per-ticket properties.

See also Consecutive Digits In Any Order ticket filter.

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Digits Per Ticket

Digits Per Ticket summary statistics shows the frequency of first/last digits in analyzed tickets.

The table below shows the statistical analysis of First Digits of all draws in Expert Lotto 6/49 Demo lottery:

First Digits	Occurrence
0	1093
1	1162
2	1155
3	1210
4	1140
5	0
6	0
7	0
8	0
9	0

You can see that first digits 5 to 9 are not present because it is x/49 lottery and the highest possible number is 49. You can also see that the most frequent first digit is 3. That indicates that the most frequent winning numbers are from the range 30 to 39.

Similar table is available for the last digits.

See also First/Last Digits filter.

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Number Groups

These statistics track how numbers in analyzed tickets fall into user-defined number groups.

For example the default number groups in Expert Lotto 6/49 Demo Lottery are

- *Group 1* - numbers 1 to 10
- *Group 2* - numbers 11 to 20
- *Group 3* - numbers 21 to 30
- *Group 4* - numbers 31 to 40
- *Group 5* - numbers 41 to 49

When analyzing e.g. the latest draw in Expert Lotto 6/49 Demo Lottery with winning numbers 23-29-36-42-44-47-[07] then column *Number Groups Distribution* in e.g. Winning Numbers Properties windows shows value *0-0-2-1-3*. It means that analyzed draw has zero numbers from *Group 1*, zero numbers from *Group 2*, two numbers (23 and 29) from *Group 3*, one number (36) from *Group 4* and two numbers (44 and 47) from *Group 5*.

Number Group Count column in the same window shows how many groups the analyzed numbers fall in. In this case the latest draw has numbers from three different groups (*Group 3, Group 4* and *Group 5*) so that column shows value of 3 for the latest draw.

These statistics are available in summary form and also as per-ticket properties.

See also Number Group and Number Groups Patterns filters and Number Groups Distribution and Number Group Repeats statistics.

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Number Groups Distribution

These statistics show all possible number groups distributions that ticket numbers can create and how many times such distribution values have been found in analyzed tickets.

For example the default number groups in Expert Lotto 6/49 Demo Lottery are

- *Group 1* - numbers 1 to 10
- *Group 2* - numbers 11 to 20
- *Group 3* - numbers 21 to 30
- *Group 4* - numbers 31 to 40

- *Group 5* - numbers 41 to 49

When analyzing e.g. the latest draw in Expert Lotto 6/49 Demo Lottery with winning numbers 23-29-36-42-44-47-[07] then *Number Groups Distribution* analyzer will show value "1" in the *Latest* column for row labeled *0-0-2-1-3*. It means that the latest analyzed draw has zero numbers from *Group 1*, zero numbers from *Group 2*, two numbers (23 and 29) from *Group 3*, one number (36) from *Group 4* and two numbers (44 and 47) from *Group 5*.

These statistics are available in summary form and also as per-ticket properties.

See also Number Group and Number Groups Patterns filters and Number Groups and Number Group Repeats statistics.

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Positional Ticket Numbers

This statistical property tracks the occurrences of pool numbers at individual ticket positions.

When analyzing e.g. the latest draw in Expert Lotto 6/49 Demo Lottery with winning numbers 23-29-36-42-44-47-[7] then column *Position 1* in e.g. Winning Numbers Properties window shows value of 23. Column *Position 2* shows value of 29 because the second ticket number is 29 etc.

See also Numbers at Positions ticket filter and Ticket Numbers statistics.

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Positional First/Last Digit

These statistics track the occurrences of *first* and *last digits* at individual ticket positions. Each pool number breaks down into two digits. The first digit is the leading digit of the number, the last digit is the second digit of the number. For the first digit of number 23 is 2, the last digit of that number is 3. The first digit of number 9 is 0, the last digit of that number is 9.

For example in Expert Lotto 6/49 Demo Lottery the 10 latest draws are:

2010/28 Sun 2nd	23	29	36	42	44	47	[07]
2010/28 Sun 1st	06	13	14	19	41	42	[29]
2010/28 Wed 2nd	02	13	16	17	25	40	[27]
2010/28 Wed 1st	16	18	22	23	28	29	[24]

2010/27 Sun 2nd	01	06	12	24	32	41	[44]
2010/27 Sun 1st	02	15	22	29	30	37	[42]
2010/27 Wed 2nd	20	23	25	30	33	35	[07]
2010/27 Wed 1st	08	11	19	26	48	49	[18]
2010/26 Sun 2nd	08	11	18	32	36	38	[06]
2010/26 Sun 1st	05	06	11	31	40	43	[32]

First Digit analysis shows that the most frequent digit at the first ticket position is 0. It is because seven of the analyzed draws have the first drawn number lower than 10. That means the first digit is 0 - highlighted with blue background in the table above.

The same analysis of *Last Digits* shows that the most frequent last digits at ticket position 6 are digits 7 and 9 - highlighted with orange background in the table above.

These statistics are available in summary form and also as per-ticket properties.

See also Positional First/Last Digit filter.

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Positional Number Movement

These statistics compare the winning numbers of analyzed draw with winning numbers from previous draw. When analyzing Package tickets then the ticket numbers are compared with the latest draw from the selection of past winning numbers draws made in Options window.

For example the winning numbers of the latest draw in Expert Lotto 6/49 Demo Lottery are 23-29-36-42-44-47-[07], winning numbers from the previous draw are 06-13-14-19-41-42-[29]. So number movement at the first ticket position is *23-6=17*, number movement at the second ticket position is *29-13=16*, movement at the third ticket position is *36-14=22* etc. The sum of all number movement values is 17+16+22+23+3+5=86

When analyzing Package ticket, e.g. 21-27-36-38-41-48 then number movement corresponding to the latest draw will be *21-23=-2* at the first ticket position, *27-29=-2* at the second ticket position, *36-36=0* at the third position etc. The sum of all number movement values is -2-2+0-4-3+1=-10.

These statistics are available in summary form and also as per-ticket properties.

See also Number Movement filter.

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Number Movement Patterns

Number Movement Patterns compares the number of analyzed draw/ticket with the winning numbers of the previous draw.

For example the latest three draws in Expert Lotto 6/49 Demo lottery are:

2010/28 Sun 2nd	23	29	36	42	44	47	[07]
2010/28 Sun 1st	06	13	14	19	41	42	[29]
2010/28 Wed 2nd	02	13	16	17	25	40	[27]

The Number Movement Pattern for draw *2010/28 Sun 2nd* is ++++++ because all its winning numbers are greater than numbers at appropriate position in the previous draw.

The movement pattern for draw *2010/28 Sun 1st* is +=-+++. The first winning number is 6 which is greater than number 2 at previous draw, so the first part of number movement pattern value is "+". The second number, 13, is the same as in previous draw, so the pattern continues with "=" sign. Number 14 is lower than number 16 at the same position in previous draw, so the next part of movement pattern is "-". The rest of the winning numbers are greater than the numbers in previous draw, so the movement pattern ends with "+++".

These statistics are available in summary form and also as per-ticket properties.

See also Digits Movement Patterns statistics and Number Movement Pattern filter.

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Digits Movement Patterns

Digits Movement shows how first/last digits changed when compared with previous draw.

For example the latest two draws in Expert Lotto 6/49 Demo lottery are:

2010/28 Sun 2nd	23	29	36	42	44	47	[07]
2010/28 Sun 1st	06	13	14	19	41	42	[29]

So the movement of first digits in draw *2010/28 Sun 2nd* is **++++==**
That means the first digits at the first four ticket positions are greater than first digits at the same positions in previous draw. And that the last two first digits are the same as in previous draw.

The movement of last digits in the same draw is -++-++
That means the last digit at the first ticket position is lower than in the previous draw (see the last digit 3 in the latest draw and the last digit 6 in the previous

draw). The next two ticket positions have higher last digits. The last digit of number 42 in the latest draw is 2 which is lower than the last digit 9 of number 19 from the previous draw. Hence "-" sign in the property value. The last two last digits are greater than the last digits in the previous draw.

These statistics are available in summary form and also as per-ticket properties.

See also Number Movement Patterns and Digits Movement Patterns filter.

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Digits Movement Patterns

Digits Movement shows how first/last digits changed when compared with previous draw.

For example the latest two draws in Expert Lotto 6/49 Demo lottery are:

| 2010/28 Sun 2nd | 23 | 29 | 36 | 42 | 44 | 47 | [07] |
| 2010/28 Sun 1st | 06 | 13 | 14 | 19 | 41 | 42 | [29] |

So the movement of first digits in draw *2010/28 Sun 2nd* is **++++==**
That means the first digits at the first four ticket positions are greater than first digits at the same positions in previous draw. And that the last two first digits are the same as in previous draw.

The movement of last digits in the same draw is -++-++
That means the last digit at the first ticket position is lower than in the previous draw (see the last digit 3 in the latest draw and the last digit 6 in the previous draw). The next two ticket positions have higher last digits. The last digit of number 42 in the latest draw is 2 which is lower than the last digit 9 of number 19 from the previous draw. Hence "-" sign in the property value. The last two last digits are greater than the last digits in the previous draw.

These statistics are available in summary form and also as per-ticket properties.

See also Number Movement Patterns and Digits Movement Patterns filter.

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Positional Number Distance

These statistics analyze the difference of ticket numbers at neighboring ticket positions.

For example in Expert Lotto 6/49 Demo Lottery the 10 latest draws are:

2010/28 Sun 2nd	23	29	36	42	44	47	[07]
2010/28 Sun 1st	06	13	14	19	41	42	[29]
2010/28 Wed 2nd	02	13	16	17	25	40	[27]
2010/28 Wed 1st	16	18	22	23	28	29	[24]
2010/27 Sun 2nd	01	06	12	24	32	41	[44]
2010/27 Sun 1st	02	15	22	29	30	37	[42]
2010/27 Wed 2nd	20	23	25	30	33	35	[07]
2010/27 Wed 1st	08	11	19	26	48	49	[18]
2010/26 Sun 2nd	08	11	18	32	36	38	[06]
2010/26 Sun 1st	05	06	11	31	40	43	[32]

Number Distance analysis shows that the most frequent distance between numbers at the second and the first ticket positions is 3. It was found in three analyzed draws - see table cells with blue background above. The same analysis also shows that the most frequent distance between numbers at ticket position 6 and 5 is 1. It was found in 3 analyzed draws - see table cells with orange background above.

Number Distance statistical properties of the latest draw in e.g. Winning Numbers Properties window show the *Distance 2-1* is 6. Second number 29 minus the first number 23 equals 6. Value in *Distance 3-2* column is 7 because *36-29=7*. The same applies to other ticket positions.

Distance 1-0 is just a convenience value showing the number at the first ticket position.

Distance 6-1 is the distance between the last ticket number and the first ticket number (in a 6/xx lottery).

These statistics are available in summary form and also as per-ticket properties.

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Digits Sum at Positions

Shows the sum of the first digit and the last digit at all ticket positions.

For example the latest numbers in *Expert Lotto 6/49* demo lottery are 23-29-36-42-44-47-[7]. The digits sums for this ticket will be:

Digits Sum 1: 2+3=5
Digits Sum 2: 2+9=11
Digits Sum 3: 3+6=9
Digits Sum 4: 4+2=6

Digits Sum 5: 4+4=8
Digits Sum 6: 4+7=11

All these statistics are available in summary form and also as per-ticket properties.

Position Pairs Sum

Shows the sums of all number pairs in an analyzed ticket. The results will be the sum of number at the first ticket position and number at the second ticket position. Then the sum of the first number and the third number, the sum of first number and fourth number and so on up to the sum of the fifth number and the sixth number (in a 6/xx lottery).

For example the latest numbers in *Expert Lotto 6/49* demo lottery are 23-29-36-42-44-47-[7]. The position pairs sums for this ticket will be:

Positions 1+2: 23+29=52
Positions 1+3: 23+36=59
Positions 1+4: 23+42=65
Positions 1+5: 23+44=67
Positions 1+6: 23+47=70
Positions 2+3: 29+36=65
Positions 2+4: 29+42=71
Positions 2+5: 29+44=73
Positions 2+6: 29+47=76
Positions 3+4: 36+42=78
Positions 3+5: 36+44=80
Positions 3+6: 36+47=83
Positions 4+5: 42+44=86
Positions 4+6: 42+47=89
Positions 5+6: 44+47=93

All these statistics are available in summary form and also as per-ticket properties.

Positional Number Range

Number Range statistics divide the whole number pool into several chunks. Each chunk has either 5 or 10 numbers. So when playing e.g. x/49 lottery the pool will be divided into ten chunks of five numbers (1-5, 6-10, 11-15, ... , 41-45, 46-49) and five chunks of ten numbers (1-10, 11-20, ... , 41-49).

The statistics evaluate each ticket position and show which chunk the number at the given position fall into.

For example the latest draw in Expert Lotto 6/49 Demo Lottery is 23-29-36-42-44-47 so when using 5-number ranges the first number falls into range *21-25*. When using 10-number ranges the first number falls into range *21-30*.

These statistics are available in <u>summary</u> form and also as per-ticket <u>properties</u>.

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Vertical Pairs Sum

Vertical Pair Sum statistics track the sum of a ticket number at a given position and a number at the same position in selected previous draw. The distance between the draws being compared is adjustable in <u>Options</u> window.

When the draw distances are set to 1, 5 and 10 in the Options then Winning Numbers Properties window will show for example the following values in Expert Lotto 6/49 Demo Lottery:

								Vertical Pair Sum 1 [1]	Vertical Pair Sum 3 [5]	Vertical Pair Sum 6 [10]
2010/28 Sun 2nd	23	29	36	42	44	47	[07]	29	58	94
2010/28 Sun 1st	06	13	14	19	41	42	[29]	8	39	88
2010/28 Wed 2nd	02	13	16	17	25	40	[27]	18	35	83
2010/28 Wed 1st	16	18	22	23	28	29	[24]	17	40	75
2010/27 Sun 2nd	01	06	12	24	32	41	[44]	3	23	90
2010/27 Sun 1st	02	15	22	29	30	37	[42]	22	48	77
2010/27 Wed 2nd	20	23	25	30	33	35	[07]	28	50	84
2010/27 Wed 1st	08	11	19	26	48	49	[18]	16	47	88
2010/26 Sun 2nd	08	11	18	32	36	38	[06]	13	42	79
2010/26 Sun 1st	05	06	11	31	40	43	[32]	9	34	91

| 2010/26 Wed 2nd | 04 | 18 | 26 | 33 | 35 | 47 | [11] | 9 | 48 | 89 |

Value in column Vertical Pair Sum 1 [1] shows the sum of ticket numbers at the first ticket positions when the draw distance is 1.
Value in column Vertical Pair Sum 3 [5] shows the sum of ticket numbers at the third ticket positions when the draw distance is 5.
Value in column Vertical Pair Sum 6 [5] shows the sum of ticket numbers at the last ticket positions when the draw distance is 10.

These statistics are available in summary form and also as per-ticket properties.

See also Vertical Pairs Filter.

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Average Distance

This statistical property shows the average difference between ticket numbers at neighboring ticket positions.

For example the winning numbers in the latest draw of the *Expert Lotto 6/49 Demo* lottery are 23-29-36-42-44-47. The distance between the second and the first numbers is 29-23=6. The distance of the third number from the second number is 36-29=7. So the distance values are 6, 7, 6, 2, 5, the average distance value is then 4.8

See also Average Distance filter.

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Winning Numbers Ranges

Winning numbers of each draw divide the number pool into six consecutive ranges (applies to 6/xx lottery). If the latest winning numbers are for example 23-29-36-42-44-47 then the ranges are:1 to **23**, 24 to **29**, 30 to **36**, 37 to **42**, 43 to **44** and 45 to 49.
For example ticket 15-25-31-33-41-49 then has the following distribution pattern: XXX--X. The first number 15 fits into the first range (1 to 23) so the first part of the pattern is X. Second number 25 also fits into the second range (24 to 29) so the pattern continues with X. Number 31 is in the second range so the pattern has X at the third position. Numbers 31 and 41 do not fit into ranges at appropriate positions so the pattern shows - at fourth and fifth positions. The last number 49 fits into the last range so the last part of the distribution pattern is X. In total there are 4 numbers that fit into ranges of the previous draw.
Note: The first range always starts with the lowest pool number. The last number range always ends with the highest pool number.

Range Patterns

For example the latest 5 draws in Expert Lotto 6/49 Demo Lottery and their distribution patterns are:

2010/28 Sun 2nd, 23-29-36-42-44-47-[07] -----X
2010/28 Sun 1st, 06-13-14-19-41-42-[29] -XX--X
2010/28 Wed 2nd, 02-13-16-17-25-40-[27] X---XX
2010/28 Wed 1st, 16-18-22-23-28-29-[24] ---XX-
2010/27 Sun 2nd, 01-06-12-24-32-41-[44] XX-X-X

Looking at the table above we can see that for example only the last number (47) of the latest draw fits into ranges defined by the previous draw *2010/28 Sun 1st*. The matching range is 42 to 47. The distribution pattern of the latest draw is then -----X.

In Range Count

These statistics track how many analyzed ticket numbers fit into ranges defined by the numbers of the previous draw.

For example the latest 5 draws in Expert Lotto 6/49 Demo Lottery are:

Date	Numbers							In Range Count
2010/28 Sun 2nd	23	29	36	42	44	47	[07]	1
2010/28 Sun 1st	06	13	14	19	41	42	[29]	3
2010/28 Wed 2nd	02	13	16	17	25	40	[27]	3
2010/28 Wed 1st	16	18	22	23	28	29	[24]	2
2010/27 Sun 2nd	01	06	12	24	32	41	[44]	4

From the table above we can see that this statistics simply gives the count of X symbols in *Range Patterns* distribution.

For example the latest draw *2010/28 Sun 2nd* has only one number in the ranges defined by previous draw *2010/28 Sun 1st*. It is number 47 highlighted with blue color in the table above.

Draw *2010/28 Wed 2nd* has three such numbers. Number 2 is in the first range 1 to 16. Number 25 is in the range 18 to 25 and the last number 40 fits into range 26 to 49. The matching numbers are highlighted with orange color in the table above.

In Range Count statistics is available in summary form and also as per-ticket property.

See also Range Patterns ticket filter.

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Hot/Cold Numbers

These statistics show the count of hot numbers and the count of cold numbers in analyzed draws or tickets. Numbers are *hot* when they have been drawn very frequently in the last few draws, *cold* numbers are those which haven't been drawn at all or only once or twice in the last few draws.

The minimum count of hits of hot numbers and the maximum allowed hits of cold numbers are adjustable in application options under menu *Tools - Options - Number Coloring - Hot/Cold*.

If you analyze the whole winning numbers database of *Expert Lotto 6/49 Demo* lottery you will find out that winning numbers very frequently contain 0 to 2 cold numbers from previous draws. There are also very often 0 to 2 hot numbers in any past draw.
Note: the example above applies to Hot/Cold options set to *Maximum frequency of cold numbers: 1, Minimum frequency of hot numbers: 4, Scan for hot/cold numbers in 20 latest draws*.

These statistics are available in summary form and also as per-ticket properties.

See also Hot/Cold Numbers filter and Hot/Cold Numbers coloring.

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Matrix Distribution

Shows the distribution of ticket numbers into a matrix of all pool numbers. There are four ways to arrange pool numbers into a matrix. Each row of such matrix represents one group of numbers. The statistics show the distribution of analyzed ticket numbers into the groups.
The examples below are given for *Expert Lotto 6/49* demo lottery which has the latest drawn numbers 23-29-36-42-44-47-[7].

5 Vertical

This matrix has five columns, the numbers are arranged from the top to the bottom. The count of rows depends on the pool size.

1	11	21	31	41
2	12	22	32	42
3	13	23	33	43
4	14	24	34	44
5	15	25	35	45
6	16	26	36	46
7	17	27	37	47
8	18	28	38	48
9	19	29	39	49

10	20	30	40	

Each ticket number is on a separate table row so the *5 Vertical* matrix distribution for the latest winning numbers is 1-1-1-1-1-1

5 Horizontal

This matrix has five columns, the numbers are arranged from left to the right. The count of rows depends on the pool size.

1	2	3	4	5
6	7	8	9	10
11	12	13	14	15
16	17	18	19	20
21	22	**23**	24	25
26	27	28	**29**	30
31	32	33	34	35
36	37	38	39	40
41	**42**	43	**44**	45
46	**47**	48	49	

Two ticket numbers are on the same row so the *5 Horizontal* matrix distribution is 2-1-1-1-1.

9 Vertical

This matrix has 9 columns, the numbers are arranged from the top to the bottom. The count of rows depends on the pool size.

1	7	13	19	25	31	37	43	49
2	8	14	20	26	32	38	**44**	
3	9	15	21	27	33	39	45	
4	10	16	22	28	34	40	46	
5	11	17	**23**	**29**	35	41	**47**	
6	12	18	24	30	**36**	**42**	48	

Three analyzed numbers are on the same row (23,29 and 47), two numbers are on another row and a single number 44 is on another row. The *9 Vertical* matrix distribution value is then 3-2-1.

9 Horizontal

This matrix has 9 columns, the numbers are arranged from the left to the right. The count of rows depends on the pool size.

1	2	3	4	5	6	7	8	9
10	11	12	13	14	15	16	17	18
19	20	21	22	**23**	24	25	26	27
28	**29**	30	31	32	33	34	35	**36**
37	38	39	40	41	**42**	43	**44**	45
46	**47**	48	49					

Two numbers are on separate rows (23 and 47), the rest of the numbers are evenly distributed into two rows. So the *9 Horizontal* matrix distribution value is 2-2-1-1.

10 Vertical

This matrix has 10 columns, the numbers are arranged from the top to the bottom. The count of rows depends on the pool size.

1	6	11	16	21	26	31	**36**	41	46
2	7	12	17	22	27	32	37	**42**	**47**
3	8	13	18	**23**	28	33	38	43	48
4	9	14	19	24	**29**	34	39	**44**	49
5	10	15	20	25	30	35	40	45	

Two analyzed numbers are on the same row (42 and 47), two numbers are on another row (29 and 44) and two remaining numbers are each on another row. The *10 Vertical* matrix distribution value is then 2-2-1-1.

10 Horizontal

This matrix has 10 columns, the numbers are arranged from the left to the right. The count of rows depends on the pool size.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	**23**	24	25	26	27	28	**29**	30
31	32	33	34	35	**36**	37	38	39	40
41	**42**	43	**44**	45	46	**47**	48	49	

Three numbers are on the same row (42, 44 and 47), two numbers are on a different row (23 and 29) and a single number is on another row. So the *10 Horizontal* matrix distribution value is 3-2-1.

All these statistics are available in summary form and also as per-ticket properties.

Pairs

These statistics show the occurrences of all possible number pairs in analyzed tickets. In a x/49 lottery the pairs are *1-2*, *1-3, 1-4* and so on up to *47-48* and *48-49*.

For example in Expert Lotto 6/49 Demo Lottery the 10 latest draws are:

2010/28 Sun 2nd	23	29	36	42	44	47	[07]
2010/28 Sun 1st	06	13	14	19	41	42	[29]
2010/28 Wed 2nd	02	13	16	17	25	40	[27]
2010/28 Wed 1st	16	18	22	23	28	29	[24]
2010/27 Sun 2nd	01	06	12	24	32	41	[44]
2010/27 Sun 1st	02	15	22	29	30	37	[42]
2010/27 Wed 2nd	20	23	25	30	33	35	[07]
2010/27 Wed 1st	08	11	19	26	48	49	[18]
2010/26 Sun 2nd	08	11	18	32	36	38	[06]
2010/26 Sun 1st	05	06	11	31	40	43	[32]

Pairs analysis shows that the draws don't contain pair *1-2*. Also pairs *1-3, 1-4* and *1-5* are not found in analyzed tickets. Pair *1-6* occurs just once (see cells with blue background in the table above).

For example pair *22-29* has been found twice in the analyzed tickets (see cells with orange background) so the analyzer table shows *Occurrence* value of 2 in the corresponding table row.

See also Consecutive Pairs statistics.

Triplets

These statistics show the occurrences of all possible number triplets in analyzed tickets. In a x/49 the triplets are *1-2-3, 1-2-4, 1-2-5* and so on up to *46-48-49* and *47-48-49*.

See also [Consecutive Triplets](#) statistics.

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Quads

These statistics show the occurrences of all possible number quads in analyzed tickets. In a x/49 the quads are *1-2-3-4, 1-2-3-5, 1-2-3-6* and so on up to *45-47-48-49* and *46-47-48-49*.

Note: These statistics are available only in lotteries which draw five or more numbers.

See also [Consecutive Quads](#) statistics.

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Pentads

These statistics show the occurrences of all possible number pentads in analyzed tickets. In a x/49 lottery the pentads are *1-2-3-4-5, 1-2-3-4-6, 1-2-3-4-7* and so on up to *44-46-47-48-49* and *45-46-47-48-49*.

Note: These statistics are available only in lotteries which draw six or more numbers.

See also [Consecutive Pentads](#) statistics.

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2/3 - "Two If Three"

This analyzer lists all possible combinations of three numbers and counts occurrences of any of two numbers from the threer. For example the analysis of the latest draw in *Expert Lotto 6/49 Demo* lottery shows one occurrence of combination 1-2-12. The ticket numbers in the latest draw are 2-12-13-27-29-31 [7]. So we can see that two numbers of those three are present in the analyzed ticket: 2-12.

Note: This analyzer is not available for Pick-N lotteries.

See also Three if Four statistics.

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3/4 - "Three If Four"

This analyzer lists all possible combinations of four numbers and counts occurrences of any of three numbers from the four. For example the analysis of the latest draw in *Expert Lotto 6/49 Demo* lottery shows one occurrence of combination 1-2-12-13. The ticket numbers in the latest draw are 2-12-13-27-29-31 [7]. So we can see that three numbers of those four are present in the analyzed ticket: 2-12-13.

Note: This analyzer is not available for Pick-N lotteries.

See also Two if Three statistics.

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Number Combinations

The statistics show the occurrences of combinations of six and more numbers. The statistics are available only for lotteries that draw 7 and more numbers.

Note: The statistics are not available if there are too many possible combinations. For example in a x/80 Keno lottery there are over 300 millions of possible combinations of six numbers. It is possible to override this limit by starting Expert Lotto with *-J-Dstats.combo.nolimit=true* command line switch. However in that case the application may refuse to calculate the statistics if there is not enough free RAM memory.

See also Pairs, Triplets, Quads and Pentads statistics.

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Consecutive Summary

Consecutive numbers are numbers where each number is one higher than the previous one. For example *1-2* or *30-31-32* etc. *Consecutive Summary* statistics show how many combinations of consecutive numbers each analyzed ticket/draw has.

For example the latest 10 draws in Expert Lotto 6/49 Demo Lottery are:

2010/28 Sun 2nd	23	29	36	42	44	47	[07]
2010/28 Sun 1st	06	13	14	19	41	42	[29]
2010/28 Wed 2nd	02	13	16	17	25	40	[27]
2010/28 Wed 1st	16	18	22	23	28	29	[24]
2010/27 Sun 2nd	01	06	12	24	32	41	[44]
2010/27 Sun 1st	02	15	22	29	30	37	[42]
2010/27 Wed 2nd	20	23	25	30	33	35	[07]
2010/27 Wed 1st	08	11	19	26	48	49	[18]
2010/26 Sun 2nd	08	11	18	32	36	38	[06]
2010/26 Sun 1st	05	06	11	31	40	43	[32]

The analyzer table of *consecutive pairs* shows that two pairs of consecutive numbers were found in two analyzed draws (*2010/28 Sun 1st* and *2010/28 Wed 1st*). One pair of consecutive numbers was found in four draws (blue background in the table above) and four draws have no pair of consecutive numbers.

None of the 10 latest draws has any triplet of consecutive numbers, any quad or pentad of consecutive numbers.

Note: Ticket with numbers e.g. *10-15-16-17-18-20* is always evaluated as one quad of consecutive numbers (*15-16-17-18*). It never shows in the statistics of consecutive pairs as having two pairs of consecutive numbers (*15-16* and *17-18*). The same applies for tickets containing triplets or pentads of consecutive numbers.

See also Consecutive Numbers ticket filter and Consecutive Number Combinations statistics.

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Consecutive Number Combinations

Consecutive numbers are numbers where each number is one higher than the previous one.

- *Consecutive pairs* are number combinations from *1-2, 2-3, 3-4* up to *47-48* and *48-49* (in a x/49 lottery).
- *Consecutive triplets* are number combinations from *1-2-3, 2-3-4, 3-4-5* up to *46-47-48* and *47-48-49* (in a x/49 lottery).
- *Consecutive quads* are number combinations from *1-2-3-4, 2-3-4-5* up to *46-47-48-49* (in a x/49 lottery).
- *Consecutive pentads* are number combinations from *1-2-3-4-5, 2-3-4-5-6* up to *45-46-47-48-49* (in a x/49 lottery).

These statistics show the occurrences of combinations of consecutive numbers in analyzed ticket/draw.

Note: Ticket with numbers e.g. *10-15-16-17-18-20* is always evaluated as a single occurrence of a quad of consecutive numbers (*15-16-17-18*). It never shows in the statistics of consecutive pairs as an occurrence of pair *15-16* and an occurrence of pair *17-18*. The same applies for tickets containing triplets or pentads of consecutive numbers.

See also Consecutive Pairs, Consecutive Triplets and Consecutive Quads ticket filters.

See also Consecutive Summary statistics.

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Number Announcers

Number Announcers show which numbers hit most frequently in the next draw after numbers - *announcers* - from the latest draw. The statistics always apply to the latest draw in the selection of past winning numbers that have been selected for analysis.

The summary statistics show numbers hitting in the next draw when any of the numbers of the latest draw were drawn. The positional statistics show numbers hitting in the next draw at a given ticket position when a given announcer was drawn at the same position as in the latest draw.

For example in Expert Lotto 6/49 Demo Lottery the 10 latest draws are:

2010/28 Sun 2nd	**23**	**29**	**36**	**42**	**44**	**47**	[07]
2010/28 Sun 1st	06	13	14	19	41	**42**	[29]
2010/28 Wed 2nd	02	13	16	17	25	40	[27]
2010/28 Wed 1st	16	18	22	**23**	28	**29**	[24]
2010/27 Sun 2nd	01	06	12	24	32	41	[44]
2010/27 Sun 1st	02	15	22	**29**	30	37	[42]
2010/27 Wed 2nd	20	**23**	25	30	33	35	[07]
2010/27 Wed 1st	08	11	19	26	48	49	[18]
2010/26 Sun 2nd	08	11	18	32	36	38	[06]
2010/26 Sun 1st	05	06	11	31	40	43	[32]

The latest draw in the selection above is *2010/28 Sun 2nd* so the announcing numbers are *23-29-36-42-44-47*-[7]. The announcers are shown in bold font in the table above.

The summary table in *Number Announcers* statistics of the 10 latest draws shows that number 2 hits most frequently after any of the announcing numbers. Number two hit in draw *2010/27 Sun 1st* where it was announced by number 23 from the previous draw. See the cells with blue background in the table above. Number two also hit in draw *2010/28 Wed 2nd* where it was announced by number 23 and number 29 from the previous draw. Hence the summary table shows *Occurrence* value of 3 for number 2.

When *Number Announcers* statistics is calculated for the whole lottery database then the announcing numbers are again *23, 29, 36, 42, 44* and *47*. The summary statistics then for example show that number 9 followed one of the announcing numbers in the next draw most frequently when one of the announcers was drawn. It was 'announced' 112 times in the whole lottery history. On the other hand number 26 was the least frequent number in the next draw when one of the announcers was drawn, it was announced only 61 times.

The same analysis for ticket position e.g. 5 shows that numbers 34, 35 and 38 hit in the next draw at ticket position 5 most frequently (four times) when announcing number 44 was drawn at ticket position 5 in the latest draw. Statistics for ticket position 1 where the announcing number is 23 shows that only numbers 1, 8 and 17 hit in the next draw on the same first ticket position.

Note: These statistics are available only when analyzing past winning numbers draws.

See also Bonus Number Announcers, Pair Announcers and Triplet Announcers.

Bonus Number Announcers

Bonus Number Announcers show which bonus numbers hit most frequently in the next draw after bonus numbers - *announcers* - from the latest draw. The statistics always apply to the latest draw in the selection of past winning numbers that have been selected for analysis.

The summary statistics show bonus numbers hitting in the next draw when the bonus numbers of the latest draw was drawn.

See also Number Announcers.

Pair Announcers

Pair Announcers statistics is very similar to Number Announcers. Except that *Pair Announcers* track which numbers follow most frequently in the next draw when the previous draw contains at least one pair of numbers (announcing pair) from the latest draw.

For example in Expert Lotto 6/49 Demo Lottery the 10 latest draws are:

2010/28 Sun 2nd	**23**	**29**	**36**	**42**	**44**	**47**	[07]
2010/28 Sun 1st	06	13	14	19	41	42	[29]
2010/28 Wed 2nd	02	13	16	17	25	40	[27]
2010/28 Wed 1st	16	18	22	**23**	28	**29**	[24]
2010/27 Sun 2nd	01	06	12	24	32	41	[44]
2010/27 Sun 1st	02	15	22	29	30	37	[42]
2010/27 Wed 2nd	20	23	25	30	33	35	[07]
2010/27 Wed 1st	08	11	19	26	48	49	[18]
2010/26 Sun 2nd	08	11	18	32	36	38	[06]
2010/26 Sun 1st	05	06	11	31	40	43	[32]

The latest draw in the selection above is *2010/28 Sun 2nd* with winning numbers are 23-29-36-42-44-47-[7]. So the announcing pairs are *23-29, 23-36, 23-42, 23-44, 23-47, 29-36* and so on up to the last pair *44-47*. Only one of the latest 10 draws contain an announcing pair - draw *2010/28 Wed 1st* (see numbers in bold in the table above). The numbers following this announcing pair are 2, 13, 16, 17, 25, 40. Therefore the analyzer table shows occurrence value of 1 for these numbers.

Analysis of the whole lottery database shows that if one of the pairs *23-29* to *44-47* is drawn then most frequently following numbers are 36 and 46. The numbers were announced 32 times. On the other hand, numbers 32 and 33 are the least frequent as they were announced only 12 times by one of the pairs of latest winning numbers.

See also Number Announcers and Triplet Announcers.

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Triplet Announcers

Triplet Announcers statistics is the same as Pair Announcers except that it tracks which numbers follow most frequently in the next draw when the previous draw contains at least one triplet of numbers (announcing triplet) from the latest draw.

For example in Expert Lotto 6/49 Demo Lottery the 10 latest draws are:

2010/28 Sun 2nd	**23**	**29**	**36**	**42**	**44**	**47**	[07]
2010/28 Sun 1st	06	13	14	19	41	42	[29]
2010/28 Wed 2nd	02	13	16	17	25	40	[27]
2010/28 Wed 1st	16	18	22	23	28	29	[24]
2010/27 Sun 2nd	01	06	12	24	32	41	[44]
2010/27 Sun 1st	02	15	22	29	30	37	[42]
2010/27 Wed 2nd	20	23	25	30	33	35	[07]
2010/27 Wed 1st	08	11	19	26	48	49	[18]
2010/26 Sun 2nd	08	11	18	32	36	38	[06]
2010/26 Sun 1st	05	06	11	31	40	43	[32]

The latest draw in the selection above is *2010/28 Sun 2nd* with winning numbers are 23-29-36-42-44-47-[7]. So the announcing triplets are 23-29-36, 23-29-42 and so on up to the last triplet *42-44-47*. There is no such triplet in the latest 10 draws so the analyzer table shows zero occurrence for all pool numbers.

Analysis of the whole lottery database shows that if one of the triplets *23-29-36* to *42-44-47* is drawn then most frequently following number is 6, which has been announced 6 times. On the other hand, numbers 2, 24, 32 and 33 never hit in the next draw when one of the announcing triplets was drawn in the previous draw.

See also Number Announcers and Pair Announcers.

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Negative/Positive History Differences

Negative and Positive History Differences statistics track how many analyzed draws/tickets produce negative and positive *History sum differences* in a given *Level*. The analyzer shows collected data in three ways - discrete values, values grouped by range of 5 and values grouped by range of 10.

For example 10 latest draws in Expert Lotto 6/49 Demo Lottery produce the following History sum differences in Level 0:

2010/28 Sun 2nd	+13
2010/28 Sun 1st	-3
2010/28 Wed 2nd	-13
2010/28 Wed 1st	+18
2010/27 Sun 2nd	-1

2010/27 Sun 1st	-9
2010/27 Wed 2nd	+6
2010/27 Wed 1st	+15
2010/26 Sun 2nd	+13
2010/26 Sun 1st	+22

Positive History Differences analysis shows that the most frequent positive difference is +13 which occurs in two analyzed draws. The same analysis grouped by range of 5 shows that no analyzed draw has positive difference in the range of **0 to 5**, there's one draw with the difference in the range of **6 to 10** (*2010/27 Wed 2nd*), three draws with the difference in the range of **11 to 15** etc. The same analysis grouped by range of 10 shows that the most frequent range of positive history differences is **11 to 20** as there are four such analyzed draws.

Negative History Differences analysis shows that there are four different negative values (*-3, -13, -1* and *- 9*). When the analysis results are grouped by range of 5 then the most frequent negative history difference range is **1 to 5** as there are two such draws (*2010/28 Sun 1st* and *2010/27 Sun 2nd*). Results grouped by range of 10 show that the range **1 to 10** was found in three analyzed draws.

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Segment Combinations

These statistics track the occurrences of *History segment combinations* in analyzed draws/tickets.

For example 10 latest draws in Expert Lotto 6/49 Demo Lottery produce the following segment combinations in *Level 0*:

2010/28 Sun 2nd	n/a
2010/28 Sun 1st	3-3-0
2010/28 Wed 2nd	4-0-2
2010/28 Wed 1st	3-1-2
2010/27 Sun 2nd	4-2-0
2010/27 Sun 1st	2-3-1
2010/27 Wed 2nd	1-4-1
2010/27 Wed 1st	4-1-1
2010/26 Sun 2nd	3-3-0
2010/26 Sun 1st	3-3-0

See *Segmentation* tab in [Summary History](#) window for segment combinations at other *Levels*.

Segment Combinations analysis of *Level 0* for 10 latest draws then shows that the most frequent segment combination is *3-3-0*. It hit three times in the analyzed draws and its latest occurrence was just two draws ago. Other segment combinations hit just once and many segment combination haven't been found at all in the analyzed draws, e.g. *6-0-0* or *0-0-6*. So the Occurrence column shows value of 0 in corresponding table rows.

See also [Segment Combinations](#) filter.

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Unique Sum Differences

These statistics track the count of unique *History Sum differences* in analyzed tickets. A sum difference is unique if it appears in a single *Level* only.

For example the *History differences* for the latest draw in Expert Lotto 6/49 Demo Lottery are: +13, -14, -27, +17, +3, +8, +12, -5, +23, +11, +31 in *Levels 0* to *10*. None of the values repeat in any other *Level* so there are 11 unique sum differences for this draw. The analysis of 10 latest draws in that lottery then shows that the most frequent count of unique sum differences is 10 as it was found in five out of ten analyzed draw.

The count of unique sum differences for a single draw is also available in [Summary History](#) window under *Sums* tab in *Unique Differences* column.

See also [Unique Sum Differences](#) filter.

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Unique Number Differences

These statistics track how many numbers from analyzed draws/tickets have unique [History number difference](#) value in a given *Level*. A ticket number has unique *History difference* if it appears alone on a row *Segmentation* table for given *Level*.

For example the winning numbers of the latest draw in Expert Lotto 6/49 Demo Lottery look like this in [Segmentation](#) table for *Level 0* of previous draw:

1	6x	6	13	14	19	41	42
2	5x	2	16	17	25	40	
3	5x	18	22	23	28	29	
4	4x	1	12	24	32		
5	3x	15	30	37			
6	3x	20	33	35			
7	5x	8	11	26	48	49	
8	2x	36	38				
9	3x	5	31	43			
10	2x	4	47				
11	2x	44	46				
12	1x	10					
13	1x	21					
14	3x	9	34	39			
15							

Numbers 23 and 29 have the same *History difference* of 3 so there are only 5 numbers with unique *History number difference* value in that draw.

Summary analysis of *Unique Number Differences* of 10 latest draws in that lottery then shows that the most frequent count of numbers with unique differences is 5 numbers as it was found in five of the analyzed draws.

See also [Unique Number Differences](#) filter.

These statistics are available in [summary](#) form and also as per-ticket [properties](#).

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Segment Size

These statistics track the count of pool numbers in [History segments](#) generated by analyzed tickets/draws. To count pool numbers in *History segments* for past winning numbers draws, open [Summary History](#)window, switch e.g. to *Sums* tab and toggle *Details* button. The lower part of *Summary History* window will show *Number History* and *Segmentation* details for selected draw. Switch to *Segmentation* details and the table will show numbers from the first segment with white background. Numbers from the second background have pink background and numbers from the last segment have red background.

Summary History ✖

10 latest draws - Wed 1st, Wed 2nd, Sun 1st, Sun 2nd   Select...

Sums | Segmentation | Charts | Simulation   Show as: History And Difference ▾ Details

Date	Numbers	Level 0	Level 1	Level 2	Level 3
2010/28 Sun 2nd	23,29,36,42,44,47 [7]	376 [+13]	744 [-14]	1186 [-27]	1670 [+1
2010/28 Sun 1st	6,13,14,19,41,42 [29]	363 [-3]	758 [-28]	1213 [-16]	1653 [+1
2010/28 Wed 2nd	2,13,16,17,25,40 [27]	366 [-13]	786 [+7]	1229 [-10]	1637 [0]
2010/28 Wed 1st	16,18,22,23,28,29 [24]	379 [+18]	779 [-17]	1239 [0]	1637 [-3
2010/27 Sun 2nd	1,6,12,24,32,41 [44]	361 [-1]	796 [+7]	1239 [+22]	1674 [-18
2010/27 Sun 1st	2,15,22,29,30,37 [42]	362 [-9]	789 [-42]	1217 [-10]	1692 [+1
2010/27 Wed 2nd	20,23,25,30,33,35 [7]	371 [+6]	831 [+15]	1227 [+29]	1678 [+2
2010/27 Wed 1st	8,11,19,26,48,49 [18]	365 [+15]	816 [+3]	1198 [+14]	1656 [-1
2010/26 Sun 2nd	8.11.18.32.36.38 [6]	350 [+13]	813 [-18]	1184 [-15]	1669 [+1

Number History | Segmentation | Level: 0 ▾

Difference	Count	1	2	3	4	5	6
1	6x	23	29	36	42	44	47
2	5x	6	13	14	19	41	
3	5x	2	16	17	25	40	
4	3x	18	22	28			
5	4x	1	12	24	32		
6	3x	15	30	37			
7	3x	20	33	35			
8	5x	8	11	26	48	49	
9	1x	38					
10	3x	5	31	43			
11	1x	4					
12	1x	46					
13	1x	10					

Sum differences: Min=-81 Max=43

The example above shows that the latest draw in Expert Lotto 6/49 Demo Lottery has 26 numbers in *Segment 1* (there are 26 numbers with white background) and 14 numbers in *Segment 2* (numbers with pink background) and 9 numbers from *Segment 3*. *Segment Size* analysis of 10 latest draws in that lottery then for example shows that the most common size of *Segment 1* in *Level 0* is 26 numbers.

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Segment Size Repeats

The statistics show how many levels have the same segment size as 1, 2, 3 or 4 previous draws.

For example ten latest draws in the demo *Expert Lotto 6/49* lottery produce the following segment sizes in Level 2:

Draw	Segment Size 2
2010/26 Sun 1st	27-13-9
2010/26 Sun 2nd	25-15-9
2010/27 Wed 1st	26-14-9
2010/27 Wed 2nd	24-15-10
2010/27 Sun 1st	24-15-10
2010/27 Sun 2nd	23-15-11
2010/28 Wed 1st	23-15-11
2010/28 Wed 2nd	24-15-10
2010/28 Sun 1st	22-17-10
2010/28 Sun 2nd	25-13-11

From the table above we can see that the size 23 of *segment 1* in draw *2010/28 Wed 1st* repeats from the previous draw *2010/27 Sun 2nd*.

The size 15 of *segment 2* in draw *2010/28 Wed 2nd* repeats in four previous draws - from *2010/28 Wed 1st* to *2010/27 Wed 2nd*. So when analyzing Segment Size Repeats of the latest 10 draw in the demo lottery the table for *Segment 2, Repeats 4* will show *Occurrence 1* for row labeled "1". It means there is just one level (2) that has the size of segment 2 repeated in four previous draws.

See also Segment Size statistics.

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History Number Differences

This summary statistics shows the frequency of History differences of winning numbers in analyzed draws or tickets.

Example - Expert Lotto 6/49 Demo Lottery

If we analyze all past draws in *Expert Lotto 6/49 Demo* lottery we will see that the most frequent History Number Difference in Level 0 is 1. It has been found in 750 analyzed past draws. Its latest occurrence is in the very latest draw (*2010/28 Sun 2nd*, winning number 42).
On the other hand History Number Difference 46 haven't hit yet.

You can also note that History Number Difference of value 1 is the most frequent one in all History Levels. It is because at least one winning number is very often repeated from the previous draw.

See also History Number Differences filter.

Number Differences Sum

Shows the sum of History differences of the winning numbers of analyzed draw or ticket. The statistics are available for each History level and there is also the total sum across all levels.

Example - Expert Lotto 6/49 Demo Lottery

The latest winning numbers in Expert Lotto 6/49 Demo lottery are 23-29-36-42-44-47-[7] (draw *2010/28 Sun 2nd*). To find their History differences we must click menu *History - Summary History*, make sure *Sums* table is showing and then highlight **preceding** draw, i.e. draw *2010/28 Sun 1st*. Then toggle *Details* button to show *Number History* details for that draw in the lower part of the *Summary History* window. We can see that the winning numbers of the latest draw are highlighted with a black border. The number differences of the latest draw in Level 0 are:

Winning Number	Number Difference in Level 0
23	3
29	3
36	8
42	1
44	11
47	10
Sum:	**36**

The sum of all Number differences in Level 0 is 36 so the statistical property will be showing value *36* in column *Number Differences Sum 0*.

These statistics are available in summary form and also as per-ticket properties.

See also Number Differences Sum filter.

Number Differences Sum Range

This statistics is similar to Number Differences Sum statistics except that it divides all the possible sum values into several ranges.

The values are divided into chunks of ten (1-10, 11-20, 21-30, etc), chunks of 30 (1-30, 31-60, 61-90, etc) and chunks of 50 (1-50, 51-100, 101-150, etc).

See also Number Differences Sum filter and Number Differences Sum statistics.

In Range Differences

This statistics show how many History Differences fit into +/-10 range.

For example the latest two draws in *Expert Lotto 6/49 Demo* lottery have the following History differences:

							Level 0	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	Level 8	Level 9	Level 10
2010/28 Sun 2nd	23	29	36	42	44	47	[07]	+13	-14	-27	+17	+3	+8	+12	-5	+23	+11	+31
2010/28 Sun 1st	06	13	14	19	41	42	[29]	-3	-28	-16	+16	-35	-7	+9	+7	+25	+16	+21

You can see that in the latest draw *2010/28 Sun 2nd* there are three Levels where the History difference is in the range of -10 to +10 (highlighted with blue background). In previous draw *2010/28 Sun 1st* there are four such Levels (highlighted with green background).

If you analyze the whole winning numbers database of the *Expert Lotto 6/49 Demo* lottery you will find out that very frequently there are 4 to 5 Levels where the History differences are in the range -10 to +10.

▶ The range values are adjustable in application options under menu *Tools - Options - History - Ranges*. The default values are -10 to +10.

These statistics are available in summary form and also as per-ticket properties.

See also Sums History ticket filter - condition *The difference in X to Y levels is at most A to B* - and Difference Ranges statistics.

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History Sum Movement

Shows whether the History sum value in a given draw and in given Level is greater or lower than the History sum value in previous draw. A plus sign (+) means the History sum is greater than the previous value, a minus sign (-) means the sum is lower. An equals sign (=) means the History sum is the same as in previous draw.

These statistics are available in summary form and also as per-ticket properties.

See also History Sum Movement filter and History Diff Movement statistics.

History Diff Movement

Shows whether the History difference value in a given draw and in given Level is greater or lower than the History difference value in previous draw. A plus sign (+) means the History difference is greater than the previous value, a minus sign (-) means the difference is lower. An equals sign (=) means the History difference is the same as in previous draw.

These statistics are available in summary form and also as per-ticket properties.

See also History Difference Movement filter and History Sum Movement statistics.

Consecutive Negative/Positive Differences

The statistics show the maximum count of consecutive History Levels that have either only negative or only positive *History differences*.

For example that latest draw *2010/28 Sun 2nd* in the demo *Expert Lotto 6/49* lottery has the following History difference values:

Level	Diff
0	13
1	-14
2	-27
3	17
4	3
5	8
6	12
7	-5
8	23
10	11
11	31

You can see that the longest section of the table above that has only negative differences is between Levels 1 and 2 (orange background). So the *Consecutive Neg Diffs* for draw *2010/28 Sun 2nd* is **2**.

The longest section of the table that has only positive differences is between Levels 3 and 6 (blue background). So the *Consecutive Pos Diffs* for draw *2010/28 Sun 2nd* is **4**.

These statistics are available in summary form and also as per-ticket properties.

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Number Differences Sum

Shows the sum of History differences of the winning numbers of analyzed draw or ticket. The statistics are available for each History level and there is also the total sum across all levels.

Example - Expert Lotto 6/49 Demo Lottery

The latest winning numbers in Expert Lotto 6/49 Demo lottery are 23-29-36-42-44-47-[7] (draw *2010/28 Sun 2nd*). To find their History differences we must click menu *History - Summary History*, make sure *Sums* table is showing and then highlight **preceding** draw, i.e. draw *2010/28 Sun 1st*. Then toggle *Details* button to show *Number History* details for that draw in the lower part of the *Summary History* window. We can see that the winning numbers of the latest draw are highlighted with a black border. The number differences of the latest draw in Level 0 are:

Winning Number	Number Difference in Level 0
23	3
29	3
36	8
42	1
44	11
47	10
Sum:	**36**

The sum of all Number differences in Level 0 is 36 so the statistical property will be showing value *36* in column *Number Differences Sum 0*.

These statistics are available in summary form and also as per-ticket properties.
See also Number Differences Sum filter.

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History Differences Repeat

The statistics show how many History differences repeat in the same Level from previous draws. The statistics are given for repeats from a single previous draw and for repeats from 5, 10, 15, 30 and 50 previous draws.

For example draw *2010/27 Sun 1st* in the demo *Expert Lotto 6/49* lottery has two History differences repeated from the previous five draws. The History difference 14 in Level 3 repeats from draw *2010/26 Sun 2nd* and History difference 6 in Level 6 repeats from the previous draw *2010/27 Wed 2nd*.

These statistics are available in summary form and also as per-ticket properties.

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History Difference Ranges

The statistics show whether a *History difference* in a given Level is in pre-defined of -10 to +10, above that range or below that range. The value range is adjustable in application options under menu *Tools - Options - History - Ranges*. The default values are -10 to +10.

Value *"in range"* means that the History difference value is in pre-defined range. Value *">"* means the difference is above the pre-defined range, value *"<"* means the differences is below the pre-defined range.

These statistics are available in summary form and also as per-ticket properties.

See also In Range Differences statistics.

Statistical Properties

The winning numbers of each draw define various properties that can be tracked and evaluated from the statistical point of view. The statistical properties are based either solely on winning numbers of a given draw, for example the ratio of odd and even numbers or the sum of all winning numbers, or the statistical properties may relate to other winning numbers draws, for example how many numbers repeat from previous draw(s).

Most of the statistical properties have corresponding ticket filter which allows removing tickets that do (not) have the desired properties. You can see the statistical properties of past draws in a table using menu *Winning Numbers - Show As - Properties*.

Some statistical properties are available in charts where you can see the progression of the property over the selected past draws. It is usually more convenient and easier to estimate the statistical properties for the coming draws using these charts. Click menu *Winning Numbers - Show As - Charts* to open the charts window.

To see statistical properties of tickets in the Package, click menu *Package - Show As - Properties*.

You can also use menu *Tools - Ticket Properties* to open Ticket Properties window which displays the statistical properties of a ticket/draw selected in currently active window. Just click a ticket/draw in any of the following windows to see the statistical properties of that ticket/draw in *Ticket Properties* window:

- Package Table
- Package Matrix
- Package Winnings
- Package Properties

- [Winning Numbers Table](#)
- [Winning Numbers Matrix](#)
- [Winning Numbers Properties](#)
- *Complex Filter* [results table](#)

See also [Summary Statistics](#).

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Odd/Even

These statistics track the occurrences of odd and even numbers in analyzed tickets.

These statistics are available in [summary](#) form and also as per-ticket [properties](#).

See also [Odd/Even](#) ticket filter.

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Low/High

These statistics track the occurrences of low and high numbers in analyzed tickets.

Number is low when it is in the lower half of number pool, number is high when it is in the upper half of number pool.
For example in a x/40 lottery, numbers 1 to 20 are low, numbers 21 to 40 are high numbers. In a x/49 lottery, numbers 1 to 24 are low, numbers 25 to 49 are high.

These statistics are available in [summary](#) form and also as per-ticket [properties](#).

See also [Low/High](#) ticket filter.

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Sum Statistics

Ticket Sum

Ticket sum statistics track the occurrence of the sum main numbers in analyzed tickets. For example the winning numbers in the latest draw of Expert Lotto 6/49 Demo Lottery are 23-29-36-42-44-47-[07]. So the sum value for that draw is *23+29+36+42+44+47=221*.

Sum Root

Sum root is a single digit number ranging from 1 to 9. It is calculated from arithmetic sum of ticket's main numbers by repeatedly summing the digits of the sum value until only a single digit number is left. For example the sum of ticket 11-22-32-35-46-48 is 194. So the *Sum Root* value is *1+9+4=14 -> 1+4=5*.

If you analyze the whole list of all possible number combinations you will see that the Sum Root statistics divides the analyzed tickets into nine evenly-sized groups.

Odd/Even Numbers Sum

This is sum of odd or even numbers of the analyzed ticket. For example the winning numbers in the latest draw of Expert Lotto 6/49 Demo Lottery are 23-29-36-42-44-47-[07]. So the sum of odd numbers is *23+29 +47=99*. Sum of even numbers is *36 + 42 + 44 = 122*.

Low/High Numbers Sum

This is sum of low or high numbers of the analyzed ticket. For example the winning numbers in the latest draw of Expert Lotto 6/49 Demo Lottery are 23-29-36-42-44-47-[07]. So the sum of low numbers is *23* because that is the only low number in that draw. Sum of high numbers is *29 + 36 + 42 + 44 + 47 = 198*.

Odd/Even Numbers Sum Root

This is *sum root* of ticket's odd or even numbers. For example the winning numbers in the latest draw of Expert Lotto 6/49 Demo Lottery are 23-29-36-42-44-47-[07]. Sum of even numbers is *36 + 42 + 44 = 122*. The *root* of that sum is *1+2+2=5*.

Low/High Numbers Sum Root

This is sum root of ticket's low or high numbers. For example the winning numbers in the latest draw of Expert Lotto 6/49 Demo Lottery are 23-29-36-42-44-47-[07]. So the sum of low numbers is *23* because that is the only low number in that draw. The *root* of that sum is *2+3=5*. Sum of high numbers is *29 + 36 + 42 + 44 + 47 = 198*. And the *root* of that sum is *1+9+8=18 -> 1+8=9*.

Sum's Last Digit

This is the least significant (last) digit of the value of the sum of analyzed ticket numbers. So if the sum of winning numbers of the latest draw in Expert Lotto 6/49 Demo lottery is 221 (see above), then its last digit is *1*. Similar to *Sum Root* this statistics divides the full set of all possible number combinations into ten evenly sized groups.

First Digits Sum

This is the sum of all first digits of the analyzed ticket. For example the winning numbers in the latest draw of Expert Lotto 6/49 Demo Lottery are 23-29-36-42-44-47-[07]. So the first digits are 2, 2, 3, 4, 4, 4 and their sum is *19*.

Last Digits Sum

This is the sum of all last digits of the analyzed ticket. For example the winning numbers in the latest draw of Expert Lotto 6/49 Demo Lottery are 23-29-36-42-44-47-[07]. So the last digits are 3, 9, 6, 2, 4, 7 and their sum is *31*.

All Digits Sum

This is the sum of all first and last digits of the analyzed ticket. For example the winning numbers in the latest draw of Expert Lotto 6/49 Demo Lottery are 23-29-36-42-44-47-[07]. The sum of the first digits is 19, the sum of last digits is 31 so the sum of all digits is 19+31=*50*.

First Digits Sum Root

This is the sum root of all first digits of the analyzed ticket. For example the winning numbers in the latest draw of Expert Lotto 6/49 Demo Lottery are 23-29-36-42-44-47-[07]. So the first digits are 2, 2, 3, 4, 4, 4 and their sum is 19 with root value of *1*.

Last Digits Sum Root

This is the sum root of all last digits of the analyzed ticket. For example the winning numbers in the latest draw of Expert Lotto 6/49 Demo Lottery are 23-29-36-42-44-47-[07]. So the last digits are 3, 9, 6, 2, 4, 7 and their sum is 31 with root value of *4*.

Bonuses Sum

If the lottery draws two or more bonus numbers then this is the sum of all bonus numbers. If the the lottery has just one or no bonus number then these statistics are not available.

All these statistics are available in summary form and also as per-ticket properties.

See also Sum Range, Sum Root, Sum of Odd/Even Numbers, Sum of Low/High Numbers and Sum's Last Digit ticket filters.

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Repeating Numbers

These statistics track how many analyzed ticket numbers repeat from previous draws. The statistics show the count numbers repeating from *1, 3, 5* and *10* previous draws.

For example the latest 10 draws in Expert Lotto 6/49 Demo Lottery are:

2010/28 Sun 2nd	23	29	36	42	44	47	[07]
2010/28 Sun 1st	06	13	14	19	41	42	[29]
2010/28 Wed 2nd	02	13	16	17	25	40	[27]
2010/28 Wed 1st	16	18	22	23	28	29	[24]

2010/27 Sun 2nd	01	06	12	24	32	41	[44]
2010/27 Sun 1st	02	15	22	29	30	37	[42]
2010/27 Wed 2nd	20	23	25	30	33	35	[07]
2010/27 Wed 1st	08	11	19	26	48	49	[18]
2010/26 Sun 2nd	08	11	18	32	36	38	[06]
2010/26 Sun 1st	05	06	11	31	40	43	[32]

When analyzing the latest draw *2010/28 Sun 2nd* we can see that one number repeats from the previous draw. It's number 42. So the column *Repeating Numbers [1]* in e.g. Winning Numbers Properties window shows value of 1 for this draw.

When comparing the latest draw with three previous draws, we can see that 3 numbers repeat. Number 42 from previous draw and numbers 23 and 29 from draw *2010/28 Wed 1st* (see numbers with blue background in the table above). Therefore the column *Repeating Numbers [3]* shows value of 3 for this draw.

Comparing the latest draw with 5 previous draws shows that only the same three numbers repeat. So column *Repeating Numbers [5]* also shows value of 3.

Looking at 10 previous draw we can see there are 5 repeating numbers: 42 from draw *2010/28 Sun 1st*, 23 and 29 from draw *2010/28 Wed 1st*, 36 from draw *2010/26 Sun 2nd* and 47 from draw *2010/26 Wed 2nd*. Therefore the column *Repeating Numbers [10]* shows value of 5 for this draw.

Note: *Repeating Numbers* properties of Package tickets apply to the selection of past winning numbers made in Options window.

These statistics are available in summary form and also as per-ticket properties.

See also Repeating Numbers ticket filter.

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Ticket Index

This statistical property shows the *ticket index* of each analyzed ticket. The ticket index corresponds to ticket's position in the list of all possible combinations. For example in a 6/49 lottery there are 13,983,816 possible combinations starting with number combination *1-2-3-4-5-6* which has ticket index 1, then number combination *1-2-3-4-5-7* which has ticket index 2, up to the last possible combination *44-45-46-47-48-49* which has ticket index 13,983,816.

For example when analyzing the latest draw in Expert Lotto 6/49 Demo Lottery with winning numbers 23-29-36-42-44-47-[7] then column *Ticket Index* in e.g. Winning Numbers Properties window shows value 13,737,320. So this draw is very close to the end of the list of all possible combinations.

See also Ticket Index filter and Ticket Index Movement statistics.

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Ticket Index Movement

This [statistical property](#) shows the relative distance of analyzed ticket from the latest draw (when analyzing Package tickets) or from the previous draw (when analyzing winning numbers draws) in the full list of all possible combinations.

For example in a 6/49 lottery there are 13,983,816 possible combinations starting with number combination 1-2-3-4-5-6 which has ticket index 1, then number combination 1-2-3-4-5-7 which has ticket index 2, up to the last possible combination 44-45-46-47-48-49 which has ticket index 13,983,816.

Ticket index movement than compares the index of the latest draw (or the index of previous draw) with the index of the analyzed ticket. The lowest possible value is 0.0 which means that the analyzed ticket has the same numbers as the latest/previous draw. The highest possible value is 0.999999999. This happens only if the analyzed ticket numbers are 1-2-3-4-5-6 and the latest winning numbers are 44-45-46-47-48-49 or vice versa.

The winning numbers in the latest draw of Expert Lotto 6/49 Demo Lottery are: 23-29-36-42-44-47-[07], the corresponding ticket index is 13,737,320, the winning numbers in the previous draw are 06-13-14-19-41-42-[29] with ticket index of 7,453,915. So the ticket index movement in the latest draw is *(13,737,320 - 7,453,915) / 13,983,816 = 0.45* - see [Winning Numbers Properties](#) window. That means the latest ticket index 'jumped' almost half of the whole possible range.

The ticket index of number combination 1-2-3-4-5-6 is 1. So when analyzing Package tickets the ticket index movement will show *(13,737,320 - 1) / 13,983,816 = 0.98* - see [Package Properties](#) window.

Note: the ticket index movement property of Package tickets applies to the latest draw from the selection of past winning numbers made in [Options](#) window.

Negative/Positive Ticket Index Movement

This statistical property is an extension of the default ticket index movement value. However in this case the index movement value can be either negative or positive. The ticket index of the latest draw in Expert Lotto 6/49 Demo Lottery is 13,737,320 so when looking at the Negative/Positive Ticket Index Movement of Package ticket 1-2-3-4-5-6 with ticket index 1 we will see negative value -0.98.

See also [Ticket Index Movement](#) ticket filter.

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Ticket Index Positions

Ticket index is a number which uniquely identifies the ticket in the set of all possible number combinations. For example in 6/49 lottery, the ticket index 1 is equal to number combination 1-2-3-4-5-6, ticket index 2 equals to number combination 1-2-3-4-5-7, ticket index 3 is number combination 1-2-3-4-5-8 etc. Ticket numbers 44-45-46-47-48-49 have ticket index of 13,983,816.

That means there are 8 different positions. Positions of ticket index value of 1 are *0, 0, 0, 0, 0, 0, 0 and 1* and positions in ticket index 13,983,816 are *1,3,9,8,3,8,1 and 6*.

The statistics then show how many times a digit 0 to 9 appears at individual ticket index positions.

These statistics are available in summary form and also as per-ticket properties.

See also Ticket Index Position filter.

Adjacent Numbers

Adjacent numbers are numbers that are one higher or one lower than the winning numbers from the previous draw.

There are two types of Adjacent Numbers statistics. Per ticket statistics compares ticket numbers with previously drawn numbers at any ticket position. Per position statistics compares the ticket numbers at the same ticket position only.

Additional categorization is the distance between adjacent numbers. The distance ranges from 1 to 5. It means *Adjacent Numbers [1]* are numbers that are one higher or one lower then previous winning numbers. *Adjacent Numbers [2]* are numbers that are two higher or two lower then previous winning numbers. For example number 15 is *adjacent [2]* to numbers 13 and 17 respectively. The same applies to *Adjacent Numbers [3], [4]* and *[5]* respectively. For example number 31 is *adjacent [5]* to numbers 26 and 36 respectively.

Adjacent Numbers Per Ticket

For example the latest 10 draws in Expert Lotto 6/49 Demo Lottery are:

2010/28 Sun 2nd	23	29	36	42	44	47	[07]
2010/28 Sun 1st	06	13	14	19	41	42	[29]
2010/28 Wed 2nd	02	13	16	17	25	40	[27]
2010/28 Wed 1st	16	18	22	23	28	29	[24]
2010/27 Sun 2nd	01	06	12	24	32	41	[44]
2010/27 Sun 1st	02	15	22	29	30	37	[42]
2010/27 Wed 2nd	20	23	25	30	33	35	[07]
2010/27 Wed 1st	08	11	19	26	48	49	[18]
2010/26 Sun 2nd	08	11	18	32	36	38	[06]
2010/26 Sun 1st	05	06	11	31	40	43	[32]

In the latest draw *2010/28 Sun 2nd* there is only one number adjacent to the numbers of previous draw *2010/28 Sun 1st* - number **42** is adjacent to number **41** in the previous draw.

Draw *2010/28 Sun 1st* has two adjacent numbers - **14** and **41** which are adjacent to numbers **13** and **40** respectively.

Draw *2010/28 Wed 2nd* has only one adjacent number - **17** which is adjacent both to number **16** and to number **18** from the previous draw.

In total there are 7 cases of a single adjacent number and three draws have two numbers adjacent to numbers from previous draw. Adjacent numbers are highlighted with blue background in the table above.

When looking for *adjacent numbers [4]*, we can see that for example draw *2010/28 Wed 1st* has two such numbers. Number 16 is adjacent [4] to number 12 and number 28 is adjacent [4] to number 24 from previous draw. Highlighted with red background in the table above.

Adjacent Numbers Per Position

2010/28 Sun 2nd	23	29	36	42	44	47	[07]
2010/28 Sun 1st	06	13	14	19	41	42	[29]
2010/28 Wed 2nd	02	13	16	17	25	40	[27]
2010/28 Wed 1st	16	18	22	23	28	29	[24]
2010/27 Sun 2nd	01	06	12	24	32	41	[44]
2010/27 Sun 1st	02	15	22	29	30	37	[42]
2010/27 Wed 2nd	20	23	25	30	33	35	[07]
2010/27 Wed 1st	08	11	19	26	48	49	[18]
2010/26 Sun 2nd	08	11	18	32	36	38	[06]
2010/26 Sun 1st	05	06	11	31	40	43	[32]

Blue background in the table above highlights adjacent numbers [1] when comparing by ticket position. When looking for adjacent numbers [5], we can find two such numbers in e.g. draw *2010/26 Sun 2nd*. Number 11 is adjacent [5] to number 6 from previous and number 38 is adjacent to previous number 43 at the same position in previous draw. The numbers are highlighted with red background in the table above.

These statistics are available in summary form and also as per-ticket properties.

See also Adjacent Numbers filter.

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Adjacent Digits

Adjacent digits are first or last digits that are one higher or one lower than the appropriate digits from previous draw. Each pool number breaks down into two digits. The *first digit* is the leading digit of the number, the *last digit* is the second digit of the number. For example the first digit of number 23 is 2, the last digit of that number is 3. The first digit of number 9 is 0, the last digit of that number is 9.

There are two types of Adjacent Digits statistics. Per ticket statistics compares first/last digits with first/last digits at any position in the previous draw. Per position statistics compares the digits at the same ticket position only.

Adjacent Digits Per Ticket

For example the latest 2 draws in Expert Lotto 6/49 Demo Lottery are:

2010/28 Sun 2nd	23	29	36	42	44	47	[07]
2010/28 Sun 1st	06	13	14	19	41	42	[29]

There are four last digits in draw *2010/28 Sun 2nd* that are adjacent to previous draw *2010/28 Sun 1st*. Last digit 3 of number 23 is adjacent to previous numbers 14 and 42 (last digitis 4 and 2). Last digit of number 42 is adjacent to previous numbers 13 and 41 (last digits 3 and 1). Last digit 4 of number 44 is adjacent to previous number 13 (last digit 3). Last digit 7 of number 47 is adjacent to number 6 (last digit 6).

Adjacent Digits Per Position

When comparing the same two draws listed above per ticket positions, we can see that there no adjacent last digits. Only one first digit is adjacent to the first digits from previous draw at the same ticket position. The first digit of number 29 is 2 which is adjacent to the first digit 1 of number 13 from the previous draw at the same ticket position.

These statistics are available in summary form and also as per-ticket properties.

See also Adjacent Digits filter.

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Number Movement Patterns

Number Movement Patterns compares the number of analyzed draw/ticket with the winning numbers of the previous draw.

For example the latest three draws in Expert Lotto 6/49 Demo lottery are:

2010/28 Sun 2nd	23	29	36	42	44	47	[07]
2010/28 Sun 1st	06	13	14	19	41	42	[29]
2010/28 Wed 2nd	02	13	16	17	25	40	[27]

The Number Movement Pattern for draw *2010/28 Sun 2nd* is ++++++ because all its winning numbers are greater than numbers at appropriate position in the previous draw.

The movement pattern for draw *2010/28 Sun 1st* is +=-+++. The first winning number is 6 which is greater than number 2 at previous draw, so the first part of number movement pattern value is "+". The second number, 13, is the same as in previous draw, so the pattern continues with "=" sign. Number 14 is lower than

number 16 at the same position in previous draw, so the next part of movement pattern is "-". The rest of the winning numbers are greater than the numbers in previous draw, so the movement pattern ends with "+++".

These statistics are available in summary form and also as per-ticket properties.

See also Digits Movement Patterns statistics and Number Movement Pattern filter.

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Combined Statistics

With combined statistics it is possible to group up to five different statistics into a new, single statistical property and thus track the combination of statistical properties as a single event. Expert Lotto ships with three predefined combined statistics:

- Odd/Even + Low/High
- Sum Root + Odd/Even
- Sum Root + Low/High

Use menu *Tools - Options - Statistics* to define new combined statistics or to customize the existing ones.

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Odd/Even + Low/High

These statistics track the occurrence of combinations of *odd/even* numbers and *low/high* numbers.

Example

Ticket *1-2-3-4-5-6* has 3 odd numbers and 3 even numbers. All its numbers are low. So the *Odd/Even + Low/High* column in e.g. Package Properties window shows value *3:3 - 6:0* for this ticket.

The latest winning numbers in Expert Lotto 6/49 Demo Lottery are *23-29-36-42-44-47*-[07]. Three numbers are odd and three numbers are even, 1 number is low (23) and five numbers are high. So the *Odd/Even + Low/High* column in e.g. Winning Numbers Properties window shows value *3:3 - 1:5* for this draw.

These statistics are available in summary form and also as per-ticket properties.

See also Combined Statistics and Odd/Even and Low/High ticket filters.

Sum Root + Odd/Even

These statistics track the occurrence of combinations of sum root values and odd/even numbers.

Example

The sum of ticket numbers 1-2-3-4-5-6 is 27. Sum root value is then 2+7=9. Three numbers are odd and three numbers are even. So the *Sum Root + Odd/Even* column in e.g. Package Properties window shows value *7 - 3:3* for this ticket.

The latest winning numbers in Expert Lotto 6/49 Demo Lottery are 23-29-36-42-44-47-[07]. The sum of these numbers is 221 therefore the sum root value is 2+2+1 = 5. Three numbers are odd and three numbers are even. So the *Sum Root + Odd/Even* column in e.g. Winning Numbers Properties window shows value *5 - 3:3* for this draw.

These statistics are available in summary form and also as per-ticket properties.

See also Combined Statistics and Sum Root and Odd/Even ticket filters.

Sum Root + Low/High

These statistics track the occurrence of combinations of *sum root* values and *low/high numbers*.

Example

The sum of ticket numbers 1-2-3-4-5-6 is 27. Sum root value is then 2+7=9. All the numbers are low. So the *Sum Root + Low/High* column in e.g. Package Properties window shows value *7 - 6:0* for this ticket.

The latest winning numbers in Expert Lotto 6/49 Demo Lottery are 23-29-36-42-44-47-[07]. The sum of these numbers is 221 therefore the sum root value is 2+2+1 = 5. One number is low (23) and five numbers are high. So the *Sum Root + Low/High* column in e.g. Winning Numbers Properties window shows value *5 - 1:5* for this draw.

These statistics are available in summary form and also as per-ticket properties.

See also Combined Statistics and Sum Root and Low/High ticket filters.

Number Groups

These statistics track how numbers in analyzed tickets fall into user-defined number groups.

For example the default number groups in Expert Lotto 6/49 Demo Lottery are

- *Group 1* - numbers 1 to 10
- *Group 2* - numbers 11 to 20
- *Group 3* - numbers 21 to 30
- *Group 4* - numbers 31 to 40
- *Group 5* - numbers 41 to 49

When analyzing e.g. the latest draw in Expert Lotto 6/49 Demo Lottery with winning numbers 23-29-36-42-44-47-[07] then column *Number Groups Distribution* in e.g. Winning Numbers Properties windows shows value *0-0-2-1-3*. It means that analyzed draw has zero numbers from *Group 1*, zero numbers from *Group 2*, two numbers (23 and 29) from *Group 3*, one number (36) from *Group 4* and two numbers (44 and 47) from *Group 5*.

Number Group Count column in the same window shows how many groups the analyzed numbers fall in. In this case the latest draw has numbers from three different groups (*Group 3, Group 4* and *Group 5*) so that column shows value of 3 for the latest draw.

These statistics are available in summary form and also as per-ticket properties.

See also Number Group and Number Groups Patterns filters and Number Groups Distribution and Number Group Repeats statistics.

Number Groups Repeats

Number Group Repeats statistical property shows how many number within each number group repeat from previous draw.

For example the latest 2 draws in Expert Lotto 6/49 Demo Lottery are:

| 2010/28 Sun 2nd | 23 | 29 | 36 | 42 | 44 | 47 | [07] |
| 2010/28 Sun 1st | 06 | 13 | 14 | 19 | 41 | 42 | [29] |

When using the default Number Groups defined for x/49 lottery (1-10, 11-20, 21-30, 31-40 and 41-49), we can see that only one number in draw *2010/28 Sun 2nd* repeats from the previous draw. It is number 42 which comes from the last number group. So the Number Groups Repeats statistical property of the latest draw is **0-0-0-0-1**

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Match Previous Draws

These statistics show the best match of the analyzed ticket that was found in *5*, *10* and *15* latest draws.

For example the latest 10 draws in Expert Lotto 6/49 Demo Lottery are:

Draw	Numbers						Bonus
2010/28 Sun 2nd	23	29	36	42	44	47	[07]
2010/28 Sun 1st	06	13	14	19	41	42	[29]
2010/28 Wed 2nd	02	13	16	17	25	40	[27]
2010/28 Wed 1st	16	18	22	23	28	29	[24]
2010/27 Sun 2nd	01	06	12	24	32	41	[44]
2010/27 Sun 1st	02	15	22	29	30	37	[42]
2010/27 Wed 2nd	20	23	25	30	33	35	[07]
2010/27 Wed 1st	08	11	19	26	48	49	[18]
2010/26 Sun 2nd	08	11	18	32	36	38	[06]
2010/26 Sun 1st	05	06	11	31	40	43	[32]

When the latest draw *2010/28 Sun 2nd* (orange background) is compared to 5 previous draws (blue background) then the best match found is two numbers. Numbers *23* and *29* in the latest draw repeat in draw *2010/28 Wed 1st*. So the table cell in column *Match Previous 5* in Winning Numbers Properties window shows value of 2 for the latest draw.

When calculating the same property for draw *2010/28 Wed 2nd* then its winning numbers are compared with draws *2010/28 Wed 1st* to *2010/27 Wed 1st* and the best match found is just one number. For example number *16* from the previous draw or number *2* from draw *2010/27 Sun 1st*. So the table cell in column *Match Previous 5* in *Winning Numbers Properties* window shows value of 1 for this draw.

Column *Match Previous 10* shows the best match found in ten previous draws and column *Match Previous 15* shows the best match found in fifteen previous draws.

Note: The corresponding values in Package Properties window apply to the selection of past winning numbers made in Options window.

These statistics are available in summary form and also as per-ticket properties.

See also Match Winning Numbers and Highest Match ticket filters.

Ticket Panel

These statistics show the maximum count of numbers each analyzed ticket or draw has in ticket panel's row and in ticket panel's column.

For example when analyzing the latest draw in Expert Lotto 6/49 Demo Lottery with winning numbers 23-29-36-42-44-47-[7] then column *Max In Row* in e.g. Winning Numbers Properties window shows value 2 because there are at most two numbers at any row in Ticket Panel window. Column *Max In Column* in the same window shows value 2 because there are at most two numbers in any column in *Ticket Panel* window.

These statistics are available in summary form and also as per-ticket properties.

See also Ticket Panel filter.

Standard Deviation

This statistical property shows the *standard deviation* of analyzed ticket numbers. Standard deviation is a mathematical formula, which evaluates how close are the ticket numbers to each other. Low standard deviation values mean that ticket numbers are very close to each other in the number pool. High standard deviation values mean that ticket numbers are from different parts of number pool.

See also Standard Deviation ticket filter.

Draw Intervals

Draw Interval [statistical properties](#) how many draws the winning numbers skipped before being drawn in the analyzed draw.

Number Intervals

The latest two draws in Expert Lotto 6/49 Demo lottery are:

| 2010/28 Sun 2nd | 23 | 29 | 36 | 42 | 44 | 47 | [07] |
| 2010/28 Sun 1st | 06 | 13 | 14 | 19 | 41 | 42 | [29] |

Number intervals for draw *2010/28 Sun 2nd* are **3-3-8-1-11-10**. It means that numbers 23 and 29 were last drawn three draws ago (draw *2010/28 Wed 1st*). Previous occurrence of number 36 is eight draws ago (*2010/26 Sun 2nd*). Number 42 was last drawn in the previous draw, hence value "1" at appropriate position in the statistical value. The same applies for other ticket numbers.

Ticket Interval

Ticket interval is the average count of draws that elapsed since the previous occurrence of each ticket number. Individual number intervals for draw *2010/28 Sun 2nd* are 3-3-8-1-11-10. So the ticket interval value is (3+3+8+1+11+10)/6 = **6.0**

Interval Sum

Interval sum is the sum of the count of draws that elapsed since the previous occurrence of each ticket number. Individual number intervals for draw *2010/28 Sun 2nd* are 3-3-8-1-11-10. So the interval sum value is 3+3+8+1+11+10 = **36**

Positional Ticket Interval

Positional ticket interval is the average count of draws that elapsed since the previous occurrence of each ticket number at the same ticket position. Individual number intervals for draw *2010/28 Sun 2nd* are 281-164-50-200-11-10. So the positional ticket interval value is (281-164-50-200-11-10)/6 = **119.33**

Positional Interval Sum

Positional inteval sum is the sum of the count of draws that elapsed since the previous occurrence of each ticket number at the same ticket position. Individual number intervals for draw *2010/28 Sun 2nd* are 281-164-50-200-11-10. So the positional interval value is 281-164-50-200-11-10 = **716**

Positional Number Intervals

This property shows how many draws elapsed since the previous occurrence of each ticket number at the same position. Positional number intervals for the latest draw *2010/28 Sun 2nd* are 281-164-50-200-11-10. It means that for example number 23 was last draw at the first ticket position 281 draws ago.

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Knight's Move

Knight's Move statistics compare the winning numbers of analyzed draw/ticket with the winning numbers from the previous draw. The statistics then show how many numbers from the previous draw made chess-like knight's move into the analyzed draw. Knight's move is defined as follows:

Let's arrange all pool numbers into a grid with 10 columns:

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	**28**	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	

As you can see, number 1 can make L-shaped knight's move to numbers 13 or 22 respectively. For example number 28 can jump to numbers 7, 9, 16, 20, 36, 40, 47, 49 - highlighted with blue background in the table above. The same rules apply to other pool numbers.

The statistics are given for the whole analyzed ticket and also per-position when the analyzed numbers are compared with previously drawn numbers at the same ticket positions.

Let's look at the following two draws in Expert Lotto 6/49 Demo lottery:

2010/28 Wed 1st	16	18	22	23	28	29	[24]
2010/27 Sun 2nd	01	06	12	24	32	41	[44]

Per-ticket Knight's Move statistics for draw *2010/28 Wed 1st* show that there 3 numbers that knight-moved from the previous draw. Number 24 from previous draw jumped to number 16 in the analyzed draw. Number 6 made L-shaped move to number 18 and number 41 jumped to number 22.

When we compare the numbers at the same ticket positions then there's only number 6 at the second ticket position which jumped to number 18 at the same ticket position.

These statistics are available in summary form and also as per-ticket properties.

See also Knight's Move filter.

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Prime Numbers

These statistics give the count of prime numbers in analyzed tickets.

Prime numbers in the range of 1 to 100 are *2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47, 53, 59, 61, 67, 71, 73, 79, 83, 89, 97*

These statistics are available in summary form and also as per-ticket properties.

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Arithmetic Complexity

Arithmetic complexity shows the variations of differences between the numbers of analyzed tickets. The formulae is:

Arithmetic Complexity(t) = D(t) - (r-1)

where *D(t)* is the count of unique differences between all ticket numbers and *r* is the count of numbers in the analyzed ticket.

In a 6/xx lottery the Arithmetic Complexity value ranges from 0 to 10. About 74% of all possible combinations have the Arithmetic Complexity value in the range of 8 to 10.

Example

Let's analyze ticket 1-2-3-4-5-6. The differences between all ticket numbers are:

2-1 = 1
3-1 = 2
4-1 = 3
5-1 = 4
6-1 = 5
3-2 = 1
4-2 = 2
5-2 = 3
6-2 = 4
4-3 = 1
5-3 = 2
6-3 = 3
5-4 = 1
6-4 = 2
6-5 = 1

There are 5 unique differences: 1, 2, 3, 4, 5 so the Arithmetic Complexity of this ticket is 5-(6-1) = 0

The same analysis of ticket 1-2-4-8-13-21 shows the following differences:

2-1 = 1
4-1 = 3
8-1 = 7
13-1 = 12
21-1 = 20
4-2 = 2
8-2 = 6

13-2 = 11
21-2 = 19
8-4 = 4
13-4 = 9
21-4 = 17
13-8 = 5
21-8 = 13
21-13 = 8

None of the differences above repeat so there are 15 unique differences so the Arithmetic Complexity of this ticket is 15-(6-1)=10

These statistics are available in summary form and also as per-ticket properties.

See also Arithmetic Complexity filter.

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Consecutive First/Last Digits In Any Order

This statistics gives the maximum count of first and last digits that are consecutive regardless of their order within the analyzed tickets.

Each pool number breaks down into two digits. The *first digit* is the leading digit of the number, the *last digit* is the second digit of the number. For example the first digit of number 23 is 2, the last digit of that number is 3. The first digit of number 9 is 0, the last digit of that number is 9.

For example the latest draw in Expert Lotto 6/49 Demo lottery is 23-29-36-42-44-47. The first digits of that draw are 2, 2, 3, 4, 4, 4. The longest sequence of consecutive digits is 2-3-4 so the value of *Consecutive First Digits (any order)* for the latest draw is *3*.

The last digits of the latest draw are 3, 9, 6, 2, 4, 7. When sorted in ascending order the last digits are 2, 3, 4, 6, 7, 9. We can see that the longest consecutive sequence is 2-3-4 so the value of *Consecutive Last Digits (any order)* for the latest draw is *3*.

These statistics are available in summary form and also as per-ticket properties.

See also Consecutive Digits In Any Order ticket filter.

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Digits Movement Patterns

Digits Movement shows how first/last digits changed when compared with previous draw.

For example the latest two draws in Expert Lotto 6/49 Demo lottery are:

2010/28 Sun 2nd	23	29	36	42	44	47	[07]
2010/28 Sun 1st	06	13	14	19	41	42	[29]

So the movement of first digits in draw *2010/28 Sun 2nd* is **++++==**

That means the first digits at the first four ticket positions are greater than first digits at the same positions in previous draw. And that the last two first digits are the same as in previous draw.

The movement of last digits in the same draw is -++-++

That means the last digit at the first ticket position is lower than in the previous draw (see the last digit 3 in the latest draw and the last digit 6 in the previous draw). The next two ticket positions have higher last digits. The last digit of number 42 in the latest draw is 2 which is lower than the last digit 9 of number 19 from the previous draw. Hence "-" sign in the property value. The last two last digits are greater than the last digits in the previous draw.

These statistics are available in summary form and also as per-ticket properties.

See also Number Movement Patterns and Digits Movement Patterns filter.

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Positional Ticket Numbers

This statistical property tracks the occurrences of pool numbers at individual ticket positions.

When analyzing e.g. the latest draw in Expert Lotto 6/49 Demo Lottery with winning numbers 23-29-36-42-44-47-[7] then column *Position 1* in e.g. Winning Numbers Properties window shows value of 23. Column *Position 2* shows value of 29 because the second ticket number is 29 etc.

See also Numbers at Positions ticket filter and Ticket Numbers statistics.

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Positional Bonus Numbers

This statistical property tracks the occurrences of bonus and powerball numbers.

When analyzing e.g. the latest draw in Expert Lotto 6/49 Demo Lottery with winning numbers 23-29-36-42-44-47-[7] then column *Bonus* in e.g. Winning Numbers Properties window shows value of 7.

Note: Bonus numbers statistics are available only when analyzing tickets with bonus numbers or powerball numbers.

See also Bonus Numbers ticket filter and Bonus Numbers statistics.

Positional First/Last Digit

These statistics track the occurrences of *first* and *last digits* at individual ticket positions. Each pool number breaks down into two digits. The first digit is the leading digit of the number, the last digit is the second digit of the number. For the first digit of number 23 is 2, the last digit of that number is 3. The first digit of number 9 is 0, the last digit of that number is 9.

For example in Expert Lotto 6/49 Demo Lottery the 10 latest draws are:

2010/28 Sun 2nd	23	29	36	42	44	47	[07]
2010/28 Sun 1st	06	13	14	19	41	42	[29]
2010/28 Wed 2nd	02	13	16	17	25	40	[27]
2010/28 Wed 1st	16	18	22	23	28	29	[24]
2010/27 Sun 2nd	01	06	12	24	32	41	[44]
2010/27 Sun 1st	02	15	22	29	30	37	[42]
2010/27 Wed 2nd	20	23	25	30	33	35	[07]
2010/27 Wed 1st	08	11	19	26	48	49	[18]
2010/26 Sun 2nd	08	11	18	32	36	38	[06]
2010/26 Sun 1st	05	06	11	31	40	43	[32]

First Digit analysis shows that the most frequent digit at the first ticket position is 0. It is because seven of the analyzed draws have the first drawn number lower than 10. That means the first digit is 0 - highlighted with blue background in the table above.

The same analysis of *Last Digits* shows that the most frequent last digits at ticket position 6 are digits 7 and 9 - highlighted with orange background in the table above.

These statistics are available in summary form and also as per-ticket properties.

See also Positional First/Last Digit filter.

Positional Number Movement

These statistics compare the winning numbers of analyzed draw with winning numbers from previous draw. When analyzing Package tickets then the ticket numbers are compared with the latest draw from the selection of past winning numbers draws made in Options window.

For example the winning numbers of the latest draw in Expert Lotto 6/49 Demo Lottery are 23-29-36-42-44-47-[07], winning numbers from the previous draw are 06-13-14-19-41-42-[29]. So number movement at the first ticket position is *23-6=17*, number movement at the second ticket position is *29-13=16*, movement at the third ticket position is *36-14=22* etc. The sum of all number movement values is 17+16+22+23+3+5=86

When analyzing Package ticket, e.g. 21-27-36-38-41-48 then number movement corresponding to the latest draw will be *21-23=-2* at the first ticket position, *27-29=-2* at the second ticket position, *36-36=0* at the third position etc. The sum of all number movement values is -2-2+0-4-3+1=-10.

These statistics are available in summary form and also as per-ticket properties.

See also Number Movement filter.

Number Movement Patterns

Number Movement Patterns compares the number of analyzed draw/ticket with the winning numbers of the previous draw.

For example the latest three draws in Expert Lotto 6/49 Demo lottery are:

2010/28 Sun 2nd	23	29	36	42	44	47	[07]
2010/28 Sun 1st	06	13	14	19	41	42	[29]
2010/28 Wed 2nd	02	13	16	17	25	40	[27]

The Number Movement Pattern for draw *2010/28 Sun 2nd* is ++++++ because all its winning numbers are greater than numbers at appropriate position in the previous draw.

The movement pattern for draw *2010/28 Sun 1st* is +=-+++. The first winning number is 6 which is greater than number 2 at previous draw, so the first part of number movement pattern value is "+". The second number, 13, is the same as in previous draw, so the pattern continues with "=" sign. Number 14 is lower than number 16 at the same position in previous draw, so the next part of movement pattern is "-". The rest of the winning numbers are greater than the numbers in previous draw, so the movement pattern ends with "+++".

These statistics are available in summary form and also as per-ticket properties.

See also Digits Movement Patterns statistics and Number Movement Pattern filter.

Digits Movement Patterns

Digits Movement shows how first/last digits changed when compared with previous draw.

For example the latest two draws in Expert Lotto 6/49 Demo lottery are:

| 2010/28 Sun 2nd | 23 | 29 | 36 | 42 | 44 | 47 | [07] |
| 2010/28 Sun 1st | 06 | 13 | 14 | 19 | 41 | 42 | [29] |

So the movement of first digits in draw *2010/28 Sun 2nd* is **++++==**
That means the first digits at the first four ticket positions are greater than first digits at the same positions in previous draw. And that the last two first digits are the same as in previous draw.

The movement of last digits in the same draw is -++-++
That means the last digit at the first ticket position is lower than in the previous draw (see the last digit 3 in the latest draw and the last digit 6 in the previous draw). The next two ticket positions have higher last digits. The last digit of number 42 in the latest draw is 2 which is lower than the last digit 9 of number 19 from the previous draw. Hence "-" sign in the property value. The last two last digits are greater than the last digits in the previous draw.

These statistics are available in summary form and also as per-ticket properties.

See also Number Movement Patterns and Digits Movement Patterns filter.

Digits Movement Patterns

Digits Movement shows how first/last digits changed when compared with previous draw.

For example the latest two draws in Expert Lotto 6/49 Demo lottery are:

| 2010/28 Sun 2nd | 23 | 29 | 36 | 42 | 44 | 47 | [07] |

```
2010/28 Sun 1st  06  13  14  19  41  42  [29]
```

So the movement of first digits in draw *2010/28 Sun 2nd* is **++++==**
That means the first digits at the first four ticket positions are greater than first digits at the same positions in previous draw. And that the last two first digits are the same as in previous draw.

The movement of last digits in the same draw is -++-++
That means the last digit at the first ticket position is lower than in the previous draw (see the last digit 3 in the latest draw and the last digit 6 in the previous draw). The next two ticket positions have higher last digits. The last digit of number 42 in the latest draw is 2 which is lower than the last digit 9 of number 19 from the previous draw. Hence "-" sign in the property value. The last two last digits are greater than the last digits in the previous draw.

These statistics are available in summary form and also as per-ticket properties.

See also Number Movement Patterns and Digits Movement Patterns filter.

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Positional Odd/Even

This statistical property tracks the occurrence of odd and even numbers at individual ticket positions.

For example when analyzing ticket numbers 1-2-3-4-5-6 then column *Odd/Even 1* in e.g. Package Properties window shows value *odd* because the first ticket number is odd. Column *Odd/Even 2* shows value *even* because the second ticket number is even.

See also Positional Odd/Even ticket filter.

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Positional Low/High

This statistical property tracks the occurrence of *low* and *high* numbers at individual ticket positions. Number is low when it is in the lower half of number pool, number is high when it is in the upper half of number pool.

For example in a x/40 lottery, numbers 1 to 20 are low, numbers 21 to 40 are high numbers. In a x/49 lottery, numbers 1 to 24 are low, numbers 25 to 49 are high.

When analyzing e.g. the latest draw in Expert Lotto 6/49 Demo Lottery with winning numbers 23-29-36-42-44-47-[7] then column *Low/High 1* in e.g. Winning Numbers Properties window shows value *low* because the first ticket number is low. Column *Low/High 2* shows value *high* because the second ticket number is high.

See also Positional Low/High ticket filter.

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Positional Number Distance

These statistics analyze the difference of ticket numbers at neighboring ticket positions.

For example in Expert Lotto 6/49 Demo Lottery the 10 latest draws are:

2010/28 Sun 2nd	23	29	36	42	44	47	[07]
2010/28 Sun 1st	06	13	14	19	41	42	[29]
2010/28 Wed 2nd	02	13	16	17	25	40	[27]
2010/28 Wed 1st	16	18	22	23	28	29	[24]
2010/27 Sun 2nd	01	06	12	24	32	41	[44]
2010/27 Sun 1st	02	15	22	29	30	37	[42]
2010/27 Wed 2nd	20	23	25	30	33	35	[07]
2010/27 Wed 1st	08	11	19	26	48	49	[18]
2010/26 Sun 2nd	08	11	18	32	36	38	[06]
2010/26 Sun 1st	05	06	11	31	40	43	[32]

Number Distance analysis shows that the most frequent distance between numbers at the second and the first ticket positions is 3. It was found in three analyzed draws - see table cells with blue background above. The same analysis also shows that the most frequent distance between numbers at ticket position 6 and 5 is 1. It was found in 3 analyzed draws - see table cells with orange background above.

Number Distance statistical properties of the latest draw in e.g. Winning Numbers Properties window show the *Distance 2-1* is 6. Second number 29 minus the first number 23 equals 6. Value in *Distance 3-2* column is 7 because *36-29=7*. The same applies to other ticket positions.

Distance 1-0 is just a convenience value showing the number at the first ticket position.

Distance 6-1 is the distance between the last ticket number and the first ticket number (in a 6/xx lottery).

These statistics are available in summary form and also as per-ticket properties.

Positional Number Range

Number Range statistics divide the whole number pool into several chunks. Each chunk has either 5 or 10 numbers. So when playing e.g. x/49 lottery the pool will be divided into ten chunks of five numbers (1-5, 6-10, 11-15, ... , 41-45, 46-49) and five chunks of ten numbers (1-10, 11-20, ... , 41-49).

The statistics evaluate each ticket position and show which chunk the number at the given position fall into.

For example the latest draw in Expert Lotto 6/49 Demo Lottery is 23-29-36-42-44-47 so when using 5-number ranges the first number falls into range *21-25*. When using 10-number ranges the first number falls into range *21-30*.

These statistics are available in summary form and also as per-ticket properties.

Vertical Pairs Sum

Vertical Pair Sum statistics track the sum of a ticket number at a given position and a number at the same position in selected previous draw. The distance between the draws being compared is adjustable in Options window.

When the draw distances are set to 1, 5 and 10 in the Options then Winning Numbers Properties window will show for example the following values in Expert Lotto 6/49 Demo Lottery:

								Vertical Pair Sum 1 [1]	Vertical Pair Sum 3 [5]	Vertical Pair Sum 6 [10]
2010/28 Sun 2nd	23	29	36	42	44	47	[07]	29	58	94
2010/28 Sun 1st	06	13	14	19	41	42	[29]	8	39	88
2010/28 Wed 2nd	02	13	16	17	25	40	[27]	18	35	83
2010/28 Wed 1st	16	18	22	23	28	29	[24]	17	40	75
2010/27 Sun 2nd	01	06	12	24	32	41	[44]	3	23	90
2010/27 Sun 1st	02	15	22	29	30	37	[42]	22	48	77
2010/27 Wed 2nd	20	23	25	30	33	35	[07]	28	50	84
2010/27 Wed 1st	08	11	19	26	48	49	[18]	16	47	88

2010/26 Sun 2nd	08	11	18	32	36	38	[06]	13	42	79
2010/26 Sun 1st	05	06	11	31	40	43	[32]	9	34	91
2010/26 Wed 2nd	04	18	26	33	35	47	[11]	9	48	89

Value in column Vertical Pair Sum 1 [1] shows the sum of ticket numbers at the first ticket positions when the draw distance is 1.
Value in column Vertical Pair Sum 3 [5] shows the sum of ticket numbers at the third ticket positions when the draw distance is 5.
Value in column Vertical Pair Sum 6 [5] shows the sum of ticket numbers at the last ticket positions when the draw distance is 10.

These statistics are available in summary form and also as per-ticket properties.

See also Vertical Pairs Filter.

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Winning Numbers Ranges

Winning numbers of each draw divide the number pool into six consecutive ranges (applies to 6/xx lottery). If the latest winning numbers are for example 23-29-36-42-44-47 then the ranges are:1 to **23**, 24 to **29**, 30 to **36**, 37 to **42**, 43 to **44** and 45 to 49.
For example ticket 15-25-31-33-41-49 then has the following distribution pattern: XXX--X. The first number 15 fits into the first range (1 to 23) so the first part of the pattern is X. Second number 25 also fits into the second range (24 to 29) so the pattern continues with X. Number 31 is in the second range so the pattern has X at the third position. Numbers 31 and 41 do not fit into ranges at appropriate positions so the pattern shows - at fourth and fifth positions. The last number 49 fits into the last range so the last part of the distribution pattern is X. In total there are 4 numbers that fit into ranges of the previous draw.
Note: The first range always starts with the lowest pool number. The last number range always ends with the highest pool number.

Range Patterns

For example the latest 5 draws in Expert Lotto 6/49 Demo Lottery and their distribution patterns are:

2010/28 Sun 2nd, 23-29-36-42-44-47-[07] -----X
2010/28 Sun 1st, 06-13-14-19-41-42-[29] -XX--X
2010/28 Wed 2nd, 02-13-16-17-25-40-[27] X---XX
2010/28 Wed 1st, 16-18-22-23-28-29-[24] ---XX-
2010/27 Sun 2nd, 01-06-12-24-32-41-[44] XX-X-X

Looking at the table above we can see that for example only the last number (47) of the latest draw fits into ranges defined by the previous draw *2010/28 Sun 1st*. The matching range is 42 to 47. The distribution pattern of the latest draw is then *-----X*.

In Range Count

These statistics track how many analyzed ticket numbers fit into ranges defined by the numbers of the previous draw.

For example the latest 5 draws in Expert Lotto 6/49 Demo Lottery are:

Date	Numbers							In Range Count
2010/28 Sun 2nd	23	29	36	42	44	47	[07]	1
2010/28 Sun 1st	06	13	14	19	41	42	[29]	3
2010/28 Wed 2nd	02	13	16	17	25	40	[27]	3
2010/28 Wed 1st	16	18	22	23	28	29	[24]	2
2010/27 Sun 2nd	01	06	12	24	32	41	[44]	4

From the table above we can see that this statistics simply gives the count of X symbols in *Range Patterns* distribution.

For example the latest draw *2010/28 Sun 2nd* has only one number in the ranges defined by previous draw *2010/28 Sun 1st*. It is number 47 highlighted with blue color in the table above.

Draw *2010/28 Wed 2nd* has three such numbers. Number 2 is in the first range 1 to 16. Number 25 is in the range 18 to 25 and the last number 40 fits into range 26 to 49. The matching numbers are highlighted with orange color in the table above.

In Range Count statistics is available in summary form and also as per-ticket property.

See also Range Patterns ticket filter.

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Winning Numbers Ranges

Winning numbers of each draw divide the number pool into six consecutive ranges (applies to 6/xx lottery). If the latest winning numbers are for example 23-29-36-42-44-47 then the ranges are:1 to **23**, 24 to **29**, 30 to **36**, 37 to **42**, 43 to **44** and 45 to 49.

For example ticket 15-25-31-33-41-49 then has the following distribution pattern: XXX--X. The first number 15 fits into the first range (1 to 23) so the first part of the pattern is X. Second number 25 also fits into the second range (24 to 29) so the pattern continues with X. Number 31 is in the second range so the pattern has X at the third position. Numbers 31 and 41 do not fit into ranges at appropriate positions so the pattern shows - at fourth and fifth positions. The last number 49 fits into the last range so the last part of the distribution pattern is X. In total there are 4 numbers that fit into ranges of the previous draw.

Note: The first range always starts with the lowest pool number. The last number range always ends with the highest pool number.

Range Patterns

For example the latest 5 draws in Expert Lotto 6/49 Demo Lottery and their distribution patterns are:

2010/28 Sun 2nd, 23-29-36-42-44-47-[07] -----X
2010/28 Sun 1st, 06-13-14-19-41-42-[29] -XX--X
2010/28 Wed 2nd, 02-13-16-17-25-40-[27] X---XX

2010/28 Wed 1st, 16-18-22-23-28-29-[24] ---XX-
2010/27 Sun 2nd, 01-06-12-24-32-41-[44] XX-X-X

Looking at the table above we can see that for example only the last number (47) of the latest draw fits into ranges defined by the previous draw *2010/28 Sun 1st*. The matching range is 42 to 47. The distribution pattern of the latest draw is then -----X.

In Range Count

These statistics track how many analyzed ticket numbers fit into ranges defined by the numbers of the previous draw.

For example the latest 5 draws in Expert Lotto 6/49 Demo Lottery are:

Date	Numbers							In Range Count
2010/28 Sun 2nd	23	29	36	42	44	47	[07]	1
2010/28 Sun 1st	06	13	14	19	41	42	[29]	3
2010/28 Wed 2nd	02	13	16	17	25	40	[27]	3
2010/28 Wed 1st	16	18	22	23	28	29	[24]	2
2010/27 Sun 2nd	01	06	12	24	32	41	[44]	4

From the table above we can see that this statistics simply gives the count of X symbols in *Range Patterns* distribution.

For example the latest draw *2010/28 Sun 2nd* has only one number in the ranges defined by previous draw *2010/28 Sun 1st*. It is number 47 highlighted with blue color in the table above.

Draw *2010/28 Wed 2nd* has three such numbers. Number 2 is in the first range 1 to 16. Number 25 is in the range 18 to 25 and the last number 40 fits into range 26 to 49. The matching numbers are highlighted with orange color in the table above.

In Range Count statistics is available in summary form and also as per-ticket property.

See also Range Patterns ticket filter.

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Hot/Cold Numbers

These statistics show the count of hot numbers and the count of cold numbers in analyzed draws or tickets. Numbers are *hot* when they have been drawn very frequently in the last few draws, *cold* numbers are those which haven't been drawn at all or only once or twice in the last few draws.

The minimum count of hits of hot numbers and the maximum allowed hits of cold numbers are adjustable in application options under menu *Tools - Options - Number Coloring - Hot/Cold*.

If you analyze the whole winning numbers database of *Expert Lotto 6/49 Demo* lottery you will find out that winning numbers very frequently contain 0 to 2 cold numbers from previous draws. There are also very often 0 to 2 hot numbers in any past draw.

Note: the example above applies to Hot/Cold options set to *Maximum frequency of cold numbers: 1, Minimum frequency of hot numbers: 4, Scan for hot/cold numbers in 20 latest draws*.

These statistics are available in summary form and also as per-ticket properties.

See also Hot/Cold Numbers filter and Hot/Cold Numbers coloring.

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Matrix Distribution

Shows the distribution of ticket numbers into a matrix of all pool numbers. There are four ways to arrange pool numbers into a matrix. Each row of such matrix represents one group of numbers. The statistics show the distribution of analyzed ticket numbers into the groups.

The examples below are given for *Expert Lotto 6/49* demo lottery which has the latest drawn numbers 23-29-36-42-44-47-[7].

5 Vertical

This matrix has five columns, the numbers are arranged from the top to the bottom. The count of rows depends on the pool size.

1	11	21	31	41
2	12	22	32	**42**
3	13	**23**	33	43
4	14	24	34	**44**
5	15	25	35	45
6	16	26	**36**	46
7	17	27	37	**47**
8	18	28	38	48
9	19	**29**	39	49
10	20	30	40	

Each ticket number is on a separate table row so the *5 Vertical* matrix distribution for the latest winning numbers is 1-1-1-1-1-1

5 Horizontal

This matrix has five columns, the numbers are arranged from left to the right. The count of rows depends on the pool size.

1	2	3	4	5
6	7	8	9	10
11	12	13	14	15
16	17	18	19	20
21	22	**23**	24	25
26	27	28	**29**	30
31	32	33	34	35
36	37	38	39	40
41	**42**	43	**44**	45
46	**47**	48	49	

Two ticket numbers are on the same row so the *5 Horizontal* matrix distribution is 2-1-1-1-1.

9 Vertical

This matrix has 9 columns, the numbers are arranged from the top to the bottom. The count of rows depends on the pool size.

1	7	13	19	25	31	37	43	49
2	8	14	20	26	32	38	**44**	
3	9	15	21	27	33	39	45	
4	10	16	22	28	34	40	46	
5	11	17	**23**	**29**	35	41	**47**	
6	12	18	24	30	**36**	**42**	48	

Three analyzed numbers are on the same row (23,29 and 47), two numbers are on another row and a single number 44 is on another row. The *9 Vertical* matrix distribution value is then 3-2-1.

9 Horizontal

This matrix has 9 columns, the numbers are arranged from the left to the right. The count of rows depends on the pool size.

1	2	3	4	5	6	7	8	9
10	11	12	13	14	15	16	17	18
19	20	21	22	**23**	24	25	26	27

28	29	30	31	32	33	34	35	36
37	38	39	40	41	42	43	44	45
46	47	48	49					

Two numbers are on separate rows (23 and 47), the rest of the numbers are evenly distributed into two rows. So the *9 Horizontal* matrix distribution value is 2-2-1-1.

10 Vertical

This matrix has 10 columns, the numbers are arranged from the top to the bottom. The count of rows depends on the pool size.

1	6	11	16	21	26	31	36	41	46
2	7	12	17	22	27	32	37	42	47
3	8	13	18	23	28	33	38	43	48
4	9	14	19	24	29	34	39	44	49
5	10	15	20	25	30	35	40	45	

Two analyzed numbers are on the same row (42 and 47), two numbers are on another row (29 and 44) and two remaining numbers are each on another row. The *10 Vertical* matrix distribution value is then 2-2-1-1.

10 Horizontal

This matrix has 10 columns, the numbers are arranged from the left to the right. The count of rows depends on the pool size.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	

Three numbers are on the same row (42, 44 and 47), two numbers are on a different row (23 and 29) and a single number is on another row. So the *10 Horizontal* matrix distribution value is 3-2-1.

All these statistics are available in summary form and also as per-ticket properties.

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History Sums

This [statistical property](#) shows the [History](#) Sum values for tickets in the Package and for past winning numbers.

The property is added for convenience only as it provides the same information which is available in [Summary History](#) window under *Sums* tab.

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History Differences

This [statistical property](#) shows the [History](#) Differences values for tickets in the Package and for past winning numbers.

The property is added for convenience only as it provides the same information which is available in [Summary History](#) window under *Sums* tab.

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Odd/Even History Sums

This [statistical property](#) shows the ratio of odd [History](#) sums to even History sums for tickets in the Package and for past winning numbers.

The property is added for convenience only as it provides the same information which is available in [Summary History](#) window under *Sums* tab.

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Min/Max History Differences

This [statistical property](#) shows the minimum and the maximum [History](#) Difference for tickets in the Package and for past winning numbers.

The property is added for convenience only as it provides the same information which is available in [Summary History](#) window under *Sums* tab.

Negative/Positive History Differences

This [statistical property](#) shows the count of negative and positive [History](#) Differences for tickets in the Package and for past winning numbers.
The property is added for convenience only as it provides the same information which is available in [Summary History](#) window under *Sums* tab.

Standard Deviation of History Differences

This [statistical property](#) shows the standard deviation of [History](#) Differences for tickets in the Package and for past winning numbers.
The property is added for convenience only as it provides the same information which is available in [Summary History](#) window under *Sums* tab.

History Differences

This [statistical property](#) shows the [History](#) Differences values for tickets in the Package and for past winning numbers.
The property is added for convenience only as it provides the same information which is available in [Summary History](#) window under *Sums* tab.

Unique Number Differences

These statistics track how many numbers from analyzed draws/tickets have unique [History number difference](#) value in a given *Level*. A ticket number has unique *History difference* if it appears alone on a row *Segmentation* table for given *Level*.

For example the winning numbers of the latest draw in Expert Lotto 6/49 Demo Lottery look like this in [Segmentation](#) table for *Level 0* of previous draw:

1	6x	6	13	14	19	41	42
2	5x	2	16	17	25	40	
3	5x	18	22	23	28	29	
4	4x	1	12	24	32		
5	3x	15	30	37			
6	3x	20	33	35			
7	5x	8	11	26	48	49	
8	2x	36	38				
9	3x	5	31	43			
10	2x	4	47				
11	2x	44	46				
12	1x	10					
13	1x	21					
14	3x	9	34	39			
15							

Numbers 23 and 29 have the same *History difference* of 3 so there are only 5 numbers with unique *History number difference* value in that draw.

Summary analysis of *Unique Number Differences* of 10 latest draws in that lottery then shows that the most frequent count of numbers with unique differences is 5 numbers as it was found in five of the analyzed draws.

See also [Unique Number Differences](#) filter.

These statistics are available in [summary](#) form and also as per-ticket [properties](#).

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History Segments

This [statistical property](#) shows the distribution of numbers into [History](#) Segments for tickets in the Package and for past winning numbers.

The property is added for convenience only as it provides the same information which is available in [Summary History](#) window under *Segmentation* tab.

Number Differences Sum

Shows the sum of History differences of the winning numbers of analyzed draw or ticket. The statistics are available for each History level and there is also the total sum across all levels.

Example - Expert Lotto 6/49 Demo Lottery

The latest winning numbers in Expert Lotto 6/49 Demo lottery are 23-29-36-42-44-47-[7] (draw *2010/28 Sun 2nd*). To find their History differences we must click menu *History - Summary History*, make sure *Sums* table is showing and then highlight **preceding** draw, i.e. draw *2010/28 Sun 1st*. Then toggle *Details* button to show *Number History* details for that draw in the lower part of the *Summary History* window. We can see that the winning numbers of the latest draw are highlighted with a black border. The number differences of the latest draw in Level 0 are:

Winning Number	Number Difference in Level 0
23	3
29	3
36	8
42	1
44	11
47	10
Sum:	**36**

The sum of all Number differences in Level 0 is 36 so the statistical property will be showing value *36* in column *Number Differences Sum 0*.

These statistics are available in summary form and also as per-ticket properties.

See also Number Differences Sum filter.

In Range Differences

This statistics show how many History Differences fit into +/-10 range.

For example the latest two draws in *Expert Lotto 6/49 Demo* lottery have the following History differences:

							Level 0	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	Level 8	Level 9	Level 10
2010/28 Sun 2nd	23	29	36	42	44	47	[07]	+13	-14	-27	+17	+3	+8	+12	-5	+23	+11	+31
2010/28 Sun 1st	06	13	14	19	41	42	[29]	-3	-28	-16	+16	-35	-7	+9	+7	+25	+16	+21

You can see that in the latest draw *2010/28 Sun 2nd* there are three Levels where the History difference is in the range of -10 to +10 (highlighted with blue background). In previous draw *2010/28 Sun 1st* there are four such Levels (highlighted with green background).

If you analyze the whole winning numbers database of the *Expert Lotto 6/49 Demo* lottery you will find out that very frequently there are 4 to 5 Levels where the History differences are in the range -10 to +10.

▶ The range values are adjustable in application options under menu *Tools - Options - History - Ranges*. The default values are -10 to +10.

These statistics are available in summary form and also as per-ticket properties.

See also Sums History ticket filter - condition *The difference in X to Y levels is at most A to B* - and Difference Ranges statistics.

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History Sum Movement

Shows whether the History sum value in a given draw and in given Level is greater or lower than the History sum value in previous draw. A plus sign (+) means the History sum is greater than the previous value, a minus sign (-) means the sum is lower. An equals sign (=) means the History sum is the same as in previous draw.

These statistics are available in summary form and also as per-ticket properties.

See also History Sum Movement filter and History Diff Movement statistics.

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History Diff Movement

Shows whether the [History difference](#) value in a given draw and in given Level is greater or lower than the History difference value in previous draw. A plus sign (+) means the History difference is greater than the previous value, a minus sign (-) means the difference is lower. An equals sign (=) means the History difference is the same as in previous draw.

These statistics are available in [summary](#) form and also as per-ticket [properties](#).

See also [History Difference Movement](#) filter and [History Sum Movement](#) statistics.

Consecutive Negative/Positive Differences

The statistics show the maximum count of consecutive [History](#) Levels that have either only negative or only positive *History differences*.

For example that latest draw *2010/28 Sun 2nd* in the demo *Expert Lotto 6/49* lottery has the following History difference values:

Level	Diff
0	13
1	-14
2	-27
3	17
4	3
5	8
6	12
7	-5
8	23
10	11
11	31

You can see that the longest section of the table above that has only negative differences is between Levels 1 and 2 (orange background). So the *Consecutive Neg Diffs* for draw *2010/28 Sun 2nd* is **2**.

The longest section of the table that has only positive differences is between Levels 3 and 6 (blue background). So the *Consecutive Pos Diffs* for draw *2010/28 Sun 2nd* is **4**.

These statistics are available in summary form and also as per-ticket properties.

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History Differences Repeat

The statistics show how many History differences repeat in the same Level from previous draws. The statistics are given for repeats from a single previous draw and for repeats from 5, 10, 15, 30 and 50 previous draws.

For example draw *2010/27 Sun 1st* in the demo *Expert Lotto 6/49* lottery has two History differences repeated from the previous five draws. The History difference 14 in Level 3 repeats from draw *2010/26 Sun 2nd* and History difference 6 in Level 6 repeats from the previous draw *2010/27 Wed 2nd*.

These statistics are available in summary form and also as per-ticket properties.

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History Difference Ranges

The statistics show whether a *History difference* in a given Level is in pre-defined of -10 to +10, above that range or below that range. The value range is adjustable in application options under menu *Tools - Options - History - Ranges*. The default values are -10 to +10.

Value *"in range"* means that the History difference value is in pre-defined range. Value *">"* means the difference is above the pre-defined range, value *"<"* means the differences is below the pre-defined range.

These statistics are available in summary form and also as per-ticket properties.

See also In Range Differences statistics.

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What is History?

History is a unique Expert Lotto feature which provides 100% guarantee of finding the Jackpot winning ticket if several History parameters are correctly estimates.

History is based on the latest occurrences of each winning number. Most of conventional lottery strategies analyze a fixed interval of past draws. However Expert Lotto History tracks fixed count of occurrences of each number no matter how long ago the number was drawn. By default History checks 11 latest occurrences of each number in the pool, however this count is adjustable in application preferences.

The picture below shows the matrix of winning numbers database in *Expert Lotto 6/49 Demo Lottery* without the very latest draw:
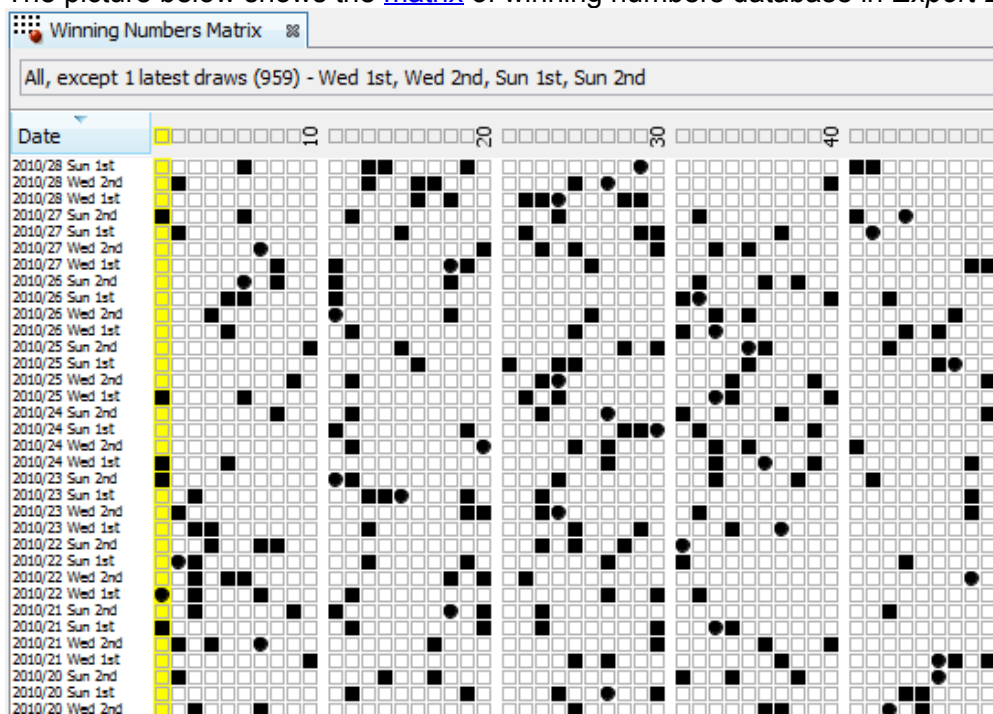
From the picture you can see that the latest occurrence of number 1 (highlighted with yellow color) happened 4 draws ago in the selected section of winning numbers database. Number 2 hit 2 draws ago, 21 draws elapsed since the latest occurrence of number 3, 10 draws elapsed since the last hit of number 4 etc. Arranged to a table the latest occurrences look like this:

Number of draws elapsed since the latest hit of each number																																																
Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49

Draws count	4	2	21	10	9	1	24	7	14	12	7	4	1	1	5	2	2	3	1	6	13	3	3	4	2	7	18	3	3	5	9	4	6	14	6	8	5	8	14	2	1	1	9	11	33	11	10	7	7

The values in the second table row are called *Level 0* in History terms.

When searching for previous hits of drawn numbers you can see from the picture above that the previous hit of number 1 happened 15 draws ago - in draw 2010/25 Wed 1st. Previous hit of number 2 can be found 5 draws ago, number 3 hit 24 draws ago etc. The table of previous hits looks like this:

Number of draws elapsed since the second latest hit of each number																																																	
Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49
Draws count	15	5	23	23	11	4	27	8	28	31	8	11	2	21	12	3	30	8	7	22	77	5	6	13	6	10	19	12	5	6	11	8	10	15	10	12	16	20	17	9	4	20	12	25	34	13	31	19	14

The values in the second table row are called *Level 1* in History terms.

The same applies to other previous occurrences of each number up to *Level 10* as by default the History tracks 11 latest occurrences of each number.

Now we can arrange tables for individual Levels into a grid to form a complete Number History:

Number	Level 0	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	Level 8	Level 9	Level 10
1	4	15	19	20	29	35	36	66	69	91	97
2	2	5	22	30	32	44	46	57	59	72	79
3	21	23	25	26	27	28	34	36	39	40	56
4	10	23	24	30	47	49	66	88	96	102	121
5	9	11	19	26	44	47	52	55	58	79	80
6	1	4	9	15	26	46	52	64	73	75	92
7	24	27	34	56	61	64	68	69	76	78	86
8	7	8	16	24	40	46	54	75	85	97	111
9	14	28	37	49	52	53	65	70	80	86	88
10	12	31	36	51	53	56	74	82	100	119	121
11	7	8	9	17	28	38	48	58	71	86	92
12	4	11	14	16	18	20	27	29	33	43	72
13	1	2	21	23	25	47	68	72	74	75	77
14	1	21	32	54	59	66	80	81	89	94	97
15	5	12	57	67	70	88	93	102	122	130	131
16	2	3	13	42	49	62	64	69	72	77	80
17	2	30	32	35	43	50	52	68	79	81	84
18	3	8	10	26	49	54	55	58	61	63	65
19	1	7	17	21	22	25	33	38	53	60	67
20	6	22	26	28	29	41	45	51	61	62	77
21	13	77	80	103	105	106	108	109	121	127	138
22	3	5	15	26	38	42	48	51	71	78	82

23	3	6	14	16	21	22	24	28	29	37	40
24	4	13	15	20	33	35	38	57	67	81	90
25	2	6	11	13	18	23	24	31	34	37	41
26	7	10	39	41	47	60	61	63	69	83	84
27	18	19	25	27	31	37	59	61	69	84	98
28	3	12	17	24	40	53	60	64	71	75	79
29	3	5	17	23	40	43	53	55	56	61	63
30	5	6	12	27	29	30	33	36	37	42	43
31	9	11	16	25	32	39	44	49	55	70	87
32	4	8	17	22	27	35	48	50	54	71	74
33	6	10	18	19	20	45	56	84	85	99	105
34	14	15	23	29	32	47	65	71	74	76	85
35	6	10	13	18	36	41	42	46	48	57	68
36	8	12	30	34	38	41	50	54	70	71	78
37	5	16	31	34	45	50	51	59	62	63	73
38	8	20	32	37	39	69	72	77	82	83	89
39	14	17	19	42	44	45	50	52	57	67	74
40	2	9	15	30	35	41	45	60	62	73	75
41	1	4	18	36	39	57	62	64	66	70	73
42	1	20	38	51	62	76	78	94	100	105	106
43	9	12	28	58	59	77	83	91	94	103	106
44	11	25	33	39	42	53	60	87	88	102	104
45	33	34	45	63	64	66	82	115	117	119	124
46	11	13	40	43	48	49	52	55	63	73	83
47	10	31	43	44	50	59	66	67	68	73	76
48	7	19	21	22	35	46	48	78	83	85	107
49	7	14	16	31	44	58	60	67	86	89	96

The next step is to calculate sum of all values in each Level column:

	Level 0	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	Level 8	Level 9	Level 10
Sum	363	758	1213	1653	1996	2404	2734	3163	3488	3864	4214

The table above shows Summary History values for the latest of the selected draws which is 2010/28 Sun 1st.

What happens after adding winning numbers from the next draw 2010/28 Sun 2nd to the *Number History* table above? Winning numbers for that draw are 23-29-36-42-44-47-[7].

Number	Level 0	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	Level 8	Level 9	Level 10
1	5	16	20	21	30	36	37	67	70	92	98
2	3	6	23	31	33	45	47	58	60	73	80
3	22	24	26	27	28	29	35	37	40	41	57
4	11	24	25	31	48	50	67	89	97	103	122
5	10	12	20	27	45	48	53	56	59	80	81
6	2	5	10	16	27	47	53	65	74	76	93
7	25	28	35	57	62	65	69	70	77	79	87
8	8	9	17	25	41	47	55	76	86	98	112
9	15	29	38	50	53	54	66	71	81	87	89
10	13	32	37	52	54	57	75	83	101	120	122
11	8	9	10	18	29	39	49	59	72	87	93
12	5	12	15	17	19	21	28	30	34	44	73
13	2	3	22	24	26	48	69	73	75	76	78
14	2	22	33	55	60	67	81	82	90	95	98
15	6	13	58	68	71	89	94	103	123	131	132
16	3	4	14	43	50	63	65	70	73	78	81
17	3	31	33	36	44	51	53	69	80	82	85
18	4	9	11	27	50	55	56	59	62	64	66
19	2	8	18	22	23	26	34	39	54	61	68
20	7	23	27	29	30	42	46	52	62	63	78
21	14	78	81	104	106	107	109	110	122	128	139
22	4	6	16	27	39	43	49	52	72	79	83
23	1	4	7	15	17	22	23	25	29	30	38
24	5	14	16	21	34	36	39	58	68	82	91
25	3	7	12	14	19	24	25	32	35	38	42
26	8	11	40	42	48	61	62	64	70	84	85
27	19	20	26	28	32	38	60	62	70	85	99
28	4	13	18	25	41	54	61	65	72	76	80
29	1	4	6	18	24	41	44	54	56	57	62
30	6	7	13	28	30	31	34	37	38	43	44
31	10	12	17	26	33	40	45	50	56	71	88
32	5	9	18	23	28	36	49	51	55	72	75
33	7	11	19	20	21	46	57	85	86	100	106

34	15	16	24	30	33	48	66	72	75	77	86
35	7	11	14	19	37	42	43	47	49	58	69
36	1	9	13	31	35	39	42	51	55	71	72
37	6	17	32	35	46	51	52	60	63	64	74
38	9	21	33	38	40	70	73	78	83	84	90
39	15	18	20	43	45	46	51	53	58	68	75
40	3	10	16	31	36	42	46	61	63	74	76
41	2	5	19	37	40	58	63	65	67	71	74
42	1	2	21	39	52	63	77	79	95	101	106
43	10	13	29	59	60	78	84	92	95	104	107
44	1	12	26	34	40	43	54	61	88	89	103
45	34	35	46	64	65	67	83	116	118	120	125
46	12	14	41	44	49	50	53	56	64	74	84
47	1	11	32	44	45	51	60	67	68	69	74
48	8	20	22	23	36	47	49	79	84	86	108
49	8	15	17	32	45	59	61	68	87	90	97

From the table above you can see that the value in *Level 0* for all winning numbers is **1**. Value in *Level 1* is previous value in *Level 0* **+ 1**, value in *Level 2* is previous value in *Level 1* **+ 1**, value in *Level 3* is previous value from *Level 2* **+ 1**.

Number History for all other pool numbers is simply the previous value incremented by 1.

The new *History Summary* is then:

	Level 0	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	Level 8	Level 9	Level 10
Sum	376	744	1186	1670	1999	2412	2746	3158	3511	3875	4245

The table above shows *Summary History* values for the latest draw 2010/28 Sun 2nd.

When compared to previous draw the *Summary History* values have changed this way:

	Level 0	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	Level 8	Level 9	Level 10
Previous sums *(2010/28 Sun 1st)*	363	758	1213	1653	1996	2404	2734	3163	3488	3864	4214
Latest sums *(2010/28 Sun 2nd)*	376	744	1186	1670	1999	2412	2746	3158	3511	3875	4245
Difference	+13	-14	-27	+17	+3	+8	+12	-5	+23	+11	+31

Now let's pretend that we don't know the actual winning numbers from the latest draw 2010/28 Sun 2nd but that we can correctly estimate how *History Summary* values will change after that draw. From the table above we can see that summary value in Level 0 will increase by 13, Level 1 will decrease by -14 etc. We will use a range of +10/-10 for each estimated value to allow for errors in our estimates. So the estimate for Level 0 is that the Summary History value will increase from +3 to +23 (the actual change in Level 0 is +13 so the range is +13-10=+3 and +13+10=23). Estimated range of changes in Level 1 is -24 to -4 (the actual

change in Level 1 is -14 so the range is -14-10=-24 and -14+10=-4). The same applies to other Levels. Now we can use these estimates in Expert Lotto filters to find the Jackpot winning ticket:

1. Click menu *Package - Insert - Full Wheel* to insert all possible combinations of 6 numbers from a pool of 49. There are 13,983,816 such tickets.
2. Click menu *Package - Reduce - Filter Tickets* and choose Sums History filter.
3. Click *Select* button in the filter window and select *All draws except one latest draw* to pretend that the numbers of the latest draw 2010/28 Sun 2nd haven't been drawn yet.
4. Enter the estimated ranges into *Min Difference* and *Max Difference* columns. The filter window should look like this then:

Sums History

Winning Numbers:

| All, except 1 latest draws (959) - Wed 1st, Wed 2nd, Sun 1st, Sun 2nd | | Select... |

Level	Sum (Prev)	Difference (Prev)	Min Difference	Max Difference	Range
☑ 0	363	-3	3	23	20
☑ 1	758	-28	-24	-4	20
☑ 2	1213	-16	-37	-17	20
☑ 3	1653	16	7	27	20
☑ 4	1996	-35	-7	13	20
☑ 5	2404	-7	-2	18	20
☑ 6	2734	9	2	22	20
☑ 7	3163	7	-15	5	20
☑ 8	3488	25	13	33	20
☑ 9	3864	16	1	21	20
☑ 10	4214	21	21	41	20

At least 11 to 11 levels must pass.

☐ The difference in 11 to 11 levels is at most -5 to 5

Matching Tickets:

Accept   Reject   OK   Apply   Cancel

Accepted: 138
Rejected: 13,983,678
    Total: 13,983,816   Preview

5. Click *OK* button to apply the filter on tickets in the Package.
6. When the filter is finished there will be 138 tickets left in the Package, including the Jackpot winning one for draw 2010/28 Sun 2nd
7. Click menu *Package - Show As - Winnings* to check the winnings of tickets left after filtering.

8. Select 1 latest draw in *Package Winnings* window and you'll see that the filtered Package does contain the Jackpot winning ticket:

Package Winnings

1 latest draws - Wed 1st, Wed 2nd, Sun 1st, Sun 2nd

☐ Show tickets winning at least: 5th Prize ▾   Next   Previous | Summary...

						Jackpot	2nd Prize	3rd Prize	4th Prize	5th Prize
23	28	36	37	42	44				1	
23	28	36	40	42	47				1	
23	28	36	42	44	47			1		
23	28	42	44	46	47				1	
23	29	36	37	42	44			1		
23	29	36	37	44	47			1		
23	29	36	42	44	47	1				
23	29	42	44	46	47			1		
23	32	36	37	42	44				1	
23	34	37	40	42	47					1
23	35	36	42	44	47			1		
23	36	37	42	44	47			1		
24	29	36	41	44	47				1	
25	29	32	37	42	44					1
25	29	36	37	42	44				1	
25	29	36	37	44	47				1	
25	29	36	40	42	47				1	
25	29	36	42	44	47					1
25	29	40	42	46	47					1
25	29	42	44	46	47				1	
25	32	36	37	42	44					1
25	32	36	40	42	47					1
25	36	37	42	44	47				1	
28	36	40	44	46	47					1

Summary Winnings

Winnings	Count
Jackpot	1
2nd Prize	0
3rd Prize	14
4th Prize	34
5th Prize	38

Close   Help

As you can see above, with History features you can reduce millions of number combinations down to a hundred or two hundred tickets while having 100% guarantee that the filtered tickets include the Jackpot winning one. However the problem is that it isn't easy to make correct estimates for all Levels. If a single Level value is out of the estimated range, the Jackpot ticket is lost. But here are various strategies to compensate for possible errors in estimated ranges.

Glossary

- **Level N** - denotes the count of draws that elapsed since the N-th latest occurrence of a given drawn number in selected section of past winning numbers draws. Level 0 corresponds to the very latest occurrence, Level 1 corresponds to the second latest occurrence etc. There are 11 Levels in Expert Lotto by default so the History features operate with Levels 0 to 10. The count History Levels is adjustable in History settings.
- **History Sum** - sums up the count of draws elapsed since a given occurrence of all pool numbers, that means it's a sum of *Number History* values in a single Level column, see above. There are 11 sums for each draw. When filtering tickets in the Package for given History Sum values, there's always one ticket left and it is the Jackpot winning one.
- **Difference** - there are two kinds of History Differences: *Number Difference* and *Sum Difference*.

- *Number Difference* relates to a single pool number. It is the count of draws elapsed between two following hits of a given number. For example, if the latest hit of number 1 happened 5 draws ago (*Level 0*) and the second latest occurrence of number 1 happened 16 draws ago (*Level 1*) then the *Number Difference* in *Level 1* for pool number 1 is 16-5=11. That means 11 draws elapsed between two latest hits of number 1. The *Number Difference* in *Level 0* is the same as the *Number History* value, i.e. the count of draws elapsed since the very latest occurrence of a given number.
- *Sum Difference* relates to *History Sum* values. It is the difference between *History Sum* values in two consecutive draws. For example if *History Sum* value in *Level 0* is 376 in the latest draw and the previous *History Sum* is 363 then the *Sum Difference* in *Level 0* for the latest draw is 376-363=13. If *History Sum* value in *Level 1* is 744 for the latest draw and the previous *Sum* in the same Level is 758 then the *Sum Difference* in *Level 1* for the latest draw is 744-758=-14.

- **Segment** - consists of pool numbers whose *Number Differences* are in a given range. By default there are three *Segments* in Expert Lotto. The first *Segment* contains numbers with *Number Differences* ranging 1 to 6, the second *Segment* has numbers with *Differences* of 7 to 12 and the last *Segment* has numbers with *Differences* of 13 or higher. The segmentation of pool numbers varies for each History Levels. You can adjust the default segment settings in History settings.
- **Segment Combination** - shows the division of winning numbers from the **following** draw into the *Segments* for given draw in a given Level. For example segment combination *3-1-2* means that *Segment 1* contains 3 of the winning numbers of the following draw, 1 winning number of the following draw is from the second segment and two winning numbers of the following draw belong to *Segment 3*.
- **Estimates** - when looking for the winning numbers you must guess how the *History Sum* values will change in the coming draw. Since it's extremely difficult to guess the exact *History Sum* value for the next draw we usually estimate a range the future *History Sum* value will be in. For example if the latest *History Sum* value is 376 in Level 0 then we might estimate the next draw will produce *History Sum* value in the range of 380 to 400. It means that our estimated *Sum Difference* range is +4 to +24. (Note this is just an example - the estimated range values are picked at random).

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Latest History

Latest History window shows the history of numbers in the main pool for the selected past winning numbers draws. The window opens from menu *History - Latest*.

The field at the top of the window shows the past draws the *Number History* is calculated from. Click *Select* button to select a different part of winning numbers database for the *Latest History* window.

▶ You can open multiple *Latest History* windows - right-click the window header and select *Clone Document* from its popup menu.

The actual latest History is presented in two forms - *Number History* and *Segmentation*. Click buttons at the top left corner of the window to switch between *Number History* and *Segmentation* tables.

Number History

This table shows how many draws elapsed since the eleven latest occurrences of each number in the pool. The historical occurrences are called *Levels*. *Level 0* represents the very latest occurrence of each number, *Level 1* corresponds to previous occurrence of each number etc. The count of levels is adjustable in History settings.

Latest History ✖

All 960 draws - Wed 1st, Wed 2nd, Sun 1st, Sun 2nd

Number History | Segmentation | Show as: History And Difference ▾

Number	Level 0	Level 1	Level 2	Level 3	Level 4	Level 5	Le
1	5	16 [+11]	20 [+4]	21 [+1]	30 [+9]	36 [+6]	37
2	3	6 [+3]	23 [+17]	31 [+8]	33 [+2]	45 [+12]	47
3	22	24 [+2]	26 [+2]	27 [+1]	28 [+1]	29 [+1]	35
4	11	24 [+13]	25 [+1]	31 [+6]	48 [+17]	50 [+2]	67
5	10	12 [+2]	20 [+8]	27 [+7]	45 [+18]	48 [+3]	53
6	2	5 [+3]	10 [+5]	16 [+6]	27 [+11]	47 [+20]	53
7	25	28 [+3]	35 [+7]	57 [+22]	62 [+5]	65 [+3]	69
8	8	9 [+1]	17 [+8]	25 [+8]	41 [+16]	47 [+6]	55
9	15	29 [+14]	38 [+9]	50 [+12]	53 [+3]	54 [+1]	66
10	13	32 [+19]	37 [+5]	52 [+15]	54 [+2]	57 [+3]	75
11	8	9 [+1]	10 [+1]	18 [+8]	29 [+11]	39 [+10]	49
12	5	12 [+7]	15 [+3]	17 [+2]	19 [+2]	21 [+2]	28
13	2	3 [+1]	22 [+19]	24 [+2]	26 [+2]	48 [+22]	69

The screen shot above shows *Number History* of Expert Lotto 6/49 demo lottery. From the table you can see that the latest occurrence of number 1 happened 5 draws ago. The second latest occurrence of number 1 happened 16 draws ago, that's a difference of 11 draws since the very latest occurrence as given in square brackets. The third latest occurrence of number 1 was 20 draws ago which is a difference of 4 draws from the second latest occurrence of that number. The same applies for other pool numbers and other Levels.

You can use *Show as* combo box to change the table format to show:

- History and Difference
- History Only
- Difference and History
- Difference Only

Note: In case of Level 0 the *History* value and the *Difference* value are the same as there's no previous Level to compare the History value with. History/Difference value 1 in Level 0 means that the given number hit in the very latest draw.

The difference value is very important as it divides the whole number pool into several segments:

- *Segment 1* contains pool numbers with *Difference* values ranging from 1 to 6 (inclusive). History values of numbers from *Segment 1* have regular white background in the Number History table.
- *Segment 2* consists of numbers with *Difference* values ranging from 7 to 12 (inclusive). History values of numbers from *Segment 2* are highlighted with pink background in the Number History table.
- *Segment 3* contains pool numbers with *Difference* value 13 or higher. History values of numbers from *Segment 3* are highlighted with red background in the Number History table.

Note: You can customize the *Segments* in History settings.

The segmentation of pool numbers is different for each History Level because the Difference values of a given pool number differ in each Level. See also the Segmentation table description below.

▶ Hover mouse cursor over table header to show the count of numbers from each History segment in given Level. For example tooltip in table column for Level 1 showing
29, diff sum: 73
13, diff sum: 121
7, diff sum: 174
means that there are 29 numbers in Level 1 with the differences from 1 to 6 and the sum of their differences is 73, 13 numbers with the differences from 7 to 12 with total sum of differences 121 and 7 numbers with the differences 13 and higher and their sum of differences is 174.

▶ Click column header of any Level to sort the *Number History* table in ascending or descending order.

▶ Ticket filters History Number Differences and History Number Differences + Odd/Even are based the *Differences* of pool numbers.

The sum of all History values for each Level column is available at the bottom of this *Number History* table. The very last row in this table, labeled *What If*, shows how *Summary History* values would change if given numbers were drawn:

The screen shot above shows that the latest *Sum History* in Level 0 is 376 (in Expert Lotto 6/49 demo lottery). If numbers 1-2-3-4-5-6-[7] were drawn in the next draw then the *Sum History* in Level 0 would change to 372, which a difference of -4 when compared to the current latest draw. *Sum History* in Level 1 would change from 744 to 759, which is a difference of +15 etc.

Naturally, you can enter your own numbers into *What If* toolbar or use e.g. tickets in the Package as *What If* numbers, read more here. Note that current What If numbers are highlighted with black border in *Number* column and that the whole *Number History* table is recalculated as if the highlighted numbers were actually drawn.

Segmentation

Segmentation table shows *Number History* differences values. The first table column lists all History differences found in a given level while table rows list all pool numbers with the given History difference.

All 960 draws - Wed 1st, Wed 2nd, Sun 1st, Sun 2nd

Number History | Segmentation | Level: 0 ▾ Draw Simulation

Difference	Count	1	2	3	4	5	6
1	6x	23	29	36	42	44	47
2	5x	6	13	14	19	41	
3	5x	2	16	17	25	40	
4	3x	18	22	28			
5	4x	1	12	24	32		
6	3x	15	30	37			
7	3x	20	33	35			
8	5x	8	11	26	48	49	
9	1x	38					
10	3x	5	31	43			
11	1x	4					
12	1x	46					
13	1x	10					
14	1x	21					
15	3x	9	34	39			
16							
17							
18							
19	1x	27					
20							
21							
22	1x	3					
23							
24							
25	1x	7					
26							
27							
28							
29							
30							
31							
32							
33							
34	1x	45					

▶ When playing e.g. 6/xx lottery you can use your mouse to select six table cells (i.e. six pool numbers) and then click ➕ button in the toolbar to add the selected numbers as a new ticket into the Package.

From the picture above you can see that History difference value **1** applies to pool numbers **23, 29, 36, 42, 44, 47**, which are the winning numbers for the latest draw. Second table row lists 5 numbers with History difference of **2**, they are **6, 13, 14, 19, 41**. The same applies to other table rows. There is only one number - **45** - with the highest History difference value of **34**.

Note that background color separates pool numbers into appropriate *Segments* according to their History differences. These colors are also automatically available in Number Coloring toolbar.

▶ Current *What If* numbers are highlighted with black border in the *Segmentation* table.

▶ Hovering mouse cursor in *Count* column shows a tooltip describing the count of numbers in given Segment, the average History difference value and the sum of all History differences in the segment.

Status bar at the bottom of the window shows the minimum and maximum possible *Summary History* difference for current Level and the total count of numbers in each History segment:

- If numbers with the lowest History difference are drawn in the next draw then the Summary History difference will reach its maximum possible value of 43 in Level 0. This will happen if numbers 23, 29, 36, 42, 44, 47 hit again in the next draw.
- If numbers with the highest History difference are drawn in the next draw then the Summary History difference will reach its minimum possible value for given Level. In the screen shot above the lowest possible Summary History difference is -59. This will happen if numbers 45, 7, 3, 27, 9 and 34 or 39 hit in the next draw.

Use *Level* combo box to see *Segmentation* table for other History Levels.

▶ See also History Level Synchronization.

Button *Draw Simulation* toggles draw simulation pane where you can run several test draws and see summary statistics of changes in History values.

See also Summary History and My Estimates.

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Summary History

This window opens from menu *History - Summary*.

The field at the top of the window shows the past draws the *Summary History* is calculated from. Click *Select* button to select a different part of winning numbers database for the *Summary History* window.

▶ You can open multiple *Summary History* windows - right-click the window header and select *Clone Document* from its popup menu.

▶ You can change the layout of split windows using menu *View - Split orientation*.

Summary History window presents its data in several forms, see below. Click buttons at the top-left corner of the window to switch its content.

Sums

Sums table shows *History Sums* and *Differences* for selected past draws. The table has the following columns:

- **Date** - date of the draw.
- **Numbers** - winning numbers for given draw date.
- **Level N** - *History sum* and *difference* value for given draw and given *Level*. You can use *Show as* combo box to change the table format to show:
  - *History and Difference* - the first number is *History Sum* for given draw, the second number is the *sum difference* from previous draw.
  - *History Only* - table cells show only *History Sum* value.
  - *Difference and History* - the first number is the *sum difference* from previous draw, the second number is the actual *History Sum*.
  - *Difference Only* - table shows only *differences* from previous draw.
- **Odd : Even (sums)** - the ratio of odd *History sums* to even *History sums*. See also Odd/Even History Sums ticket filter.
- **StdDev (differences)** - standard deviation of *History differences*. See also Standard Deviation of Differences ticket filter.
- **Min Difference** - the lowest *History difference* for given draw.
- **Max Difference** - the highest *History difference* for given draw.
- **Negative Differences** - the count of *History differences* that are lower than zero. See also Negative/Positive History Differences ticket filter.
- **Positive Differences** - the count of *History differences* that are greater than zero.
- **Unique Differences** - the count of *History differences* that don't repeat in a given draw. For example compare the *History differences* for the two latest draws in Expert Lotto 6/49 demo lottery:

Date	Level 0	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	Level 8	Level 9	Level 10
2010/28 Sun 1st	363 [-3]	758 [-28]	1213 [-16]	1653 [+16]	1996 [-35]	2404 [-7]	2734 [+9]	3163 [+7]	3488 [+25]	3864 [+16]	4214 [+21]
2010/28 Sun 2nd	376 [+13]	744 [-14]	1186 [-27]	1670 [+17]	1999 [+3]	2412 [+8]	2746 [+12]	3158 [-5]	3511 [+23]	3875 [+11]	4245 [+31]

There are 11 unique *History differences* in the last table row (draw date *2010/28 Sun 2nd*) because none of the difference values repeat in that table row. There are only 10 unique *History differences* for draw date *2010/28 Sun 1st* because the *History difference* for *Level 3* is the same as *History difference* in *Level 9*.

See also Unique Sum Differences ticket filter.

▶ Click *Date* column header to change the order of draws in the table. You can also resize column headers by dragging their borders.

Button ± at the top of the window highlights *Level* table cells containing negative differences with red background, positive differences are highlighted with blue background.

Button *Details* toggles *Number History* and *Segmentation* details for selected table row. See Latest History window for detailed description. Note that winning numbers from the following draw are highlighted with black border.

Use menu *History - Predictions* to run automated predictions.

Segmentation

Segmentation table shows segment combinations for selected past draws.

Date	Numbers	Level 0	Level 1	Level 2	Level 3	Lev
2010/28 Sun 2nd	23,29,36,42...	n/a	n/a	n/a	n/a	n/a
2010/28 Sun 1st	6,13,14,19,...	3-3-0	3-0-3	0-4-2	5-0-1	4-1-
2010/28 Wed 2nd	2,13,16,17,...	4-0-2	1-2-3	3-0-3	4-2-0	1-1-
2010/28 Wed 1st	16,18,22,23...	3-1-2	4-1-1	3-1-2	3-2-1	2-2-
2010/27 Sun 2nd	1,6,12,24,3...	4-2-0	2-3-1	2-3-1	1-1-4	5-0-
2010/27 Sun 1st	2,15,22,29,...	2-3-1	4-1-1	5-1-0	2-1-3	5-1-
2010/27 Wed 2nd	20,23,25,30...	1-4-1	2-2-2	2-2-2	4-2-0	4-1

For example *Level 0* for draw *2010/28 Sun 1st* shows segment combination *3-3-0*. That means 3 numbers from the following draw *2010/28 Sun 2nd* are in *Segment 1*, they are numbers *23, 29* and *42*. Three numbers - *36, 44* and *47* - are from *Segment 2*. *Segment 3* for draw *2010/28 Sun 1st* has none of the winning numbers of the following draw. Use button *Details* to see the actual number differences for given draw date.

There are no segmentation values for the latest draw as the winning numbers of the following draw are not available yet.

Button *Details* toggles *Number History* and *Segmentation* details for selected table row. See Latest History window for detailed description. Note that winning numbers from the following draw are highlighted with black border.

See also Segment Combinations History ticket filter.

Charts

The charts show the evolution of *History* values for selected draws. The charts display *History Sum* values, *History Difference* and *Segmentation* data for a given *Level*. Use *Show* combo box to switch the chart type. *Level* combo box changes the current *History Level*.

You can customize the charts using buttons at the top of the window.

▶ If you prefer visual perception of History data you can estimate the future History ranges in Sum or Differences charts conveniently:

1. Select *Sums* in *Show* combo box.
2. Select *Level 0* in combo box at the top of the window.
3. Click button ▮⊹ to show chart range tool.
4. Use sliders to the right of the chart window to highlight the chart area where you think the next *History Sum* value will move to in the next draw.
5. Click menu *History - My Estimates* to open My Estimates window.
6. Click button Σ() at the top of *My Estimates* window to display sum values instead of differences.
7. Click the first table row in *My Estimates* window to highlight *Level 0*.
8. Note that *Sums Chart* hint at the lower part of *My Estimates* window shows the sum range highlighted in the chart.
9. Click button ⊡ to enter the estimated range into the fields in *My Estimates* window.
10. Repeat the steps above for all other *Levels*.
11. Click filter button ▽ at the top of *My Estimates* window to find which tickets in the Package fit into your estimated ranges or drag and drop that button into a Complex Filter window.

The same steps apply for range estimates in *Differences* chart.

▶ Click into the chart to highlight the draw nearest to mouse cursor. The selected draw will then show in [Ticket Properties](#) and [Ticket Panel](#) windows respectively.

▶ See also [History Level Synchronization](#).

Simulation

Click button ⬤ to run [draw simulation](#).

<div align="right">

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History Estimates

My Estimates window tracks your estimated ranges for [History](#) values for the coming draw. It also provides various hints to make your estimates more precise. The window opens from menu *History - My Estimates*.

The estimates are organized into a table where each row represents a single [History Level](#). Column *Min* shows the lower boundary of your estimate in a given Level. Column *Max* shows the upper bound of your estimate. You can enter estimated ranges directly from keyboard or use spinner buttons to increase or decrease Min/Max values by one. Column *Range* shows the estimated range in a given Level.

The first table column is a check box to turn corresponding Level on or off. When a Level is turned off it won't be used when filtering tickets in [Sum Range](#) ticket filter. Use this switch when you are not sure how to estimate the History values in one or more Levels. Turning a Level off does increase the count tickets left after filtering but it's probably better than loosing the Jackpot ticket due to a wrong estimate.
To turn multiple Levels on/off with a single click, first select appropriate table rows with your mouse and then click check box column of any selected row.

The last table column serves for Level locking. When a Level is locked it isn't possible to make changes in its estimated range. Lock a Level when you are done with estimating its range for the next draw. It will prevent accidental changes when working with various hints at the lower part of the window.
To lock/unlock multiple Levels with a single click, first select appropriate table rows with your mouse and then click the last column of any selected row.

My Estimates window remembers its last used values and restores them in a new application session.

Toolbar at the top of the window provides the following functions:

- ± - show estimated values as differences from the latest sum values.
- Σ() - show estimated values as absolute sums.
- ⬀ - opens a popup menu where you select [hint](#) whose values will be used in all Levels. If a Level is locked (see above) then its estimated range will not change.
- ↺ - resets estimates in selected Levels to zero.
- ⬆ - finds the minimum and the maximum possible ranges, see [Absolute Ranges](#) below.
- ▽ - filters tickets in the Package using current estimates. You can also drag and drop this button into [Complex Filter](#) window.

- 🐞 - opens <u>What-If</u> simulation window. The button is enabled only when one or more Levels are selected.

Note: *My Estimates* window operates with the selection of past draws from the last active <u>Latest History</u> or <u>Summary History</u> windows. So if you select for example 10 latest draws in *Latest History* window and then switch to *My Estimates* window, the latest sum values in *My Estimates* will be calculated from the 10 latest draws.

Hints

The lower part of *My Estimates* window provides various hints you can use when adjusting your estimates. Select a single row in the upper table to see hints for corresponding Level. Initially the estimates are empty, their *Min* and *Max* values just show *n/a*. You have to use some other History features first to generate the estimates. Click button 🔁 to use the hint values as your estimates for selected Level. This button is disabled if the hint does not have any value yet or when the selected Level is locked.

▶ Click the estimate name or the little expand button before the name to see detailed information provided by the hint.

Absolute Ranges

The hint provides the minimum and maximum possible value as calculated in <u>Lookup Min/Max Ranges</u> window.
The hint details show the tickets and the selection of past draws the min/max values were calculated from. Click button 🔁 in the toolbar at the top of the window to recalculate absolute ranges.

Sums Chart

Open *Sums Chart* in <u>History Summary</u> window and use <u>Range Tool</u> to highlight a portion of the chart. The selected sum range will be then available in this hint.
The hint details show average and median sum values from appropriate chart window.

Differences Chart

Open *Differences Chart* in <u>History Summary</u> window and use <u>Range Tool</u> to highlight a portion of the chart. The selected range of History differences will be then available in this hint.
The hint details show average and median sum values from appropriate chart window.

Simulation [segmentation]

Open <u>Latest History</u> window, switch to *Segmentation* mode and run <u>draw simulation</u>. The default hint values are the minimum and the maximum from simulation results. However since such ranges are usually too wide for reasonable filtering (depending on the nature of tickets used for draw simulation) you can fine tune this estimate by zooming a section of histogram chart in simulation results window. The zoomed range will be used as new hint values then.
The hint details show the average and median simulated sum and also the tickets and segmentation settings that were used to simulate draws.

Simulation [summary]

Open <u>Summary History</u> window, switch to *Simulation* mode and run <u>draw simulation</u>. The default hint values are the minimum and the maximum from simulation results. However since such ranges are usually too wide for reasonable filtering (depending on the nature of tickets used for draw simulation) you can fine tune this estimate by zooming a section of histogram chart in simulation results window. The zoomed range will be used as new hint values then.
The hint details show the average and median simulated sum and also the tickets and ticket filter (if any) that were used to simulate draws.

Predictions [sums] & Prediction [differences]

Select menu *History - Predictions* to run automated <u>prediction</u> of upcoming History values. The predicted values are adjusted by adding/subtracting the predefined range from <u>History settings</u>. Hint details show additional information about the predicted value.

What If [ticket]

This hint provides History values produced by current [What If](#) numbers. Hint's range is adjustable in History settings.
The hint details show the current *What If* numbers.

What If [simulation]

This shows the result of [draw simulation](#) based on History ranges in selected levels. A histogram of simulation results is also available in History charts.
The hint details show the average and median simulated sum, filtering conditions and how many simulated draws passed that condition.

▶ You should always compare all hints witch each other when estimating History values for the next draw. For example if *Differences Chart* hint shows range -15 to +5 and *Sums Chart* hint shows range +12 to +32 then it is clear that one of the estimates you made in *Sums Chart* or *Differences Chart* is wrong. You should revisit the charts, make new estimates and/or consult other hints. Alternatively, you can turn the given Level off if it isn't possible to make a solid estimate.

▶ It is possible to paste estimated ranges values from system clipboard. If you have prepared your estimates in e.g. MS Excel, you can highlight two rows or two columns of cells, copy them into system clipboard, click into *My Estimates* table and paste them as your new estimates. If *My Estimates* is showing differences (see toolbar description above) then the pasted values are interpreted also as differences, otherwise the pasted values are treated as absolute sum values.
You can also highlight a single row in Summary History window, copy it to system clipboard and then paste it into *My Estimates* window in the same way. The values will be pasted both to *Min* and *Max* fields respectively.

▶ See also [History Level Synchronization](#).

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Predictions

The goal of all lottery strategies is the prediction of winning numbers that will hit in the next draw. Lottery players in most cases search for the most frequent or the least frequent numbers, then examine the latest winning numbers and/or their statistical properties trying to guess what is the most likely to happen in the next draw.

Expert Lotto has built-in tool which automates the prediction process to some extent. The application will search through selected past draws and compare them with the latest winning numbers to predict the numbers and statistical properties that are expected in the coming draw. As all other Expert Lotto features, the predictions are based on solid math. With the same input data and the same settings the predictor will always provide the same, reproducible results. There is no magical black-box spitting out different numbers each time it is clicked. Expert Lotto predictor is based on *pattern matching* algorithm which is widely used in many other computer-assisted fields – facial recognition, statistical data analysis, signal processing etc.

Pattern Matching

The following table lists 15 latest draws in Expert Lotto 6/49 lottery in descending order:

Date	Position 1	Position 2	Position 3	Position 4	Position 5	Position 6	Bonus

2010/28 Sun 2nd	23	**29**	36	42	44	47	7
2010/28 Sun 1st	6	**13**	14	19	41	42	29
2010/28 Wed 2nd	2	**13**	16	17	25	40	27
2010/28 Wed 1st	16	**18**	22	23	28	29	24
2010/27 Sun 2nd	1	**6**	12	24	32	41	44
2010/27 Sun 1st	2	**15**	22	29	30	37	42
2010/27 Wed 2nd	20	**23**	25	30	33	35	7
2010/27 Wed 1st	8	**11**	19	26	48	49	18
2010/26 Sun 2nd	8	**11**	18	32	36	38	6
2010/26 Sun 1st	5	**6**	11	31	40	43	32
2010/26 Wed 2nd	4	**18**	26	33	35	47	11
2010/26 Wed 1st	5	**12**	25	31	44	46	33
2010/25 Sun 2nd	10	**15**	28	30	36	43	35
2010/25 Sun 1st	16	**21**	24	25	35	46	47
2010/25 Wed 2nd	9	**12**	23	34	39	49	24

The latest three numbers at the second ticket position are: 13, 13 and 29. Those three numbers form the *latest pattern*. The pattern size is 3 as it consists of three numbers.

Now we will search the past winning numbers at the second ticket position and look for a similar pattern. The table above shows that the best *matching past pattern* can be found in draws *2010/26 Sun 2nd* to *2010/27 Wed 2nd*. The past winning numbers are 11, 11 and 23. The following draw is *2010/27 Sun 1st* where the second winning number is 15. So the prediction for the coming draw *2010/29 Wed 1st* is number 15 at the second ticket position.

Let's verify our prediction in Expert Lotto:

1. Open Expert Lotto 6/49 Demo lottery.
2. Click menu *Winning Numbers – Predictions* to open *Predictions* wizard window.
3. Choose *15 latest winning numbers* in the first step, click button *Next*.
4. Select *Pattern Matching* prediction type, click button *Next*.

5. Choose prediction settings as on the picture below. Click button *Next*.

6. Make sure *Ticket Positions* under *Positional statistics* is selected, click button *Finish*.
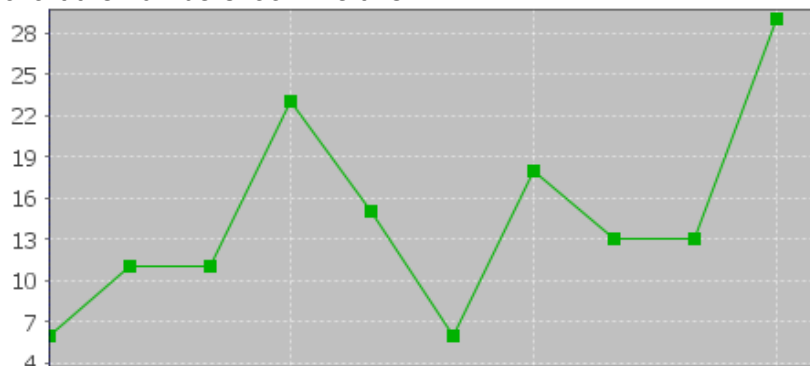
Winning Number Properties window opens and its table will show the following value in *Position 2* column:

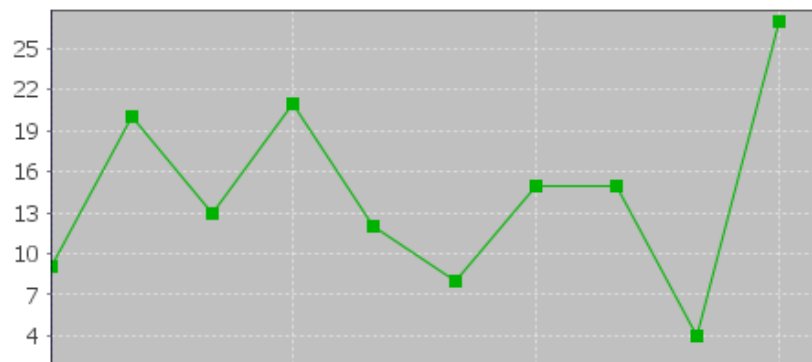| Date	Numbers	Position 1	Position 2	Position 3	Position 4	Position 5	Position 6
Prediction		2	15	22	33	35	43
2010/28 Sun 2nd	23,29,36,42...	23	29	36	42	44	47
2010/28 Sun 1st	6,13,14,19,...	6	13	14	19	41	42
2010/28 Wed 2nd	2,13,16,17,...	2	13	16	17	25	40
2010/28 Wed 1st	16,18,22,23...	16	18	22	23	28	29

The downward red triangle indicates that the predicted trend is *decrease* in the next draw and the number predicted for the second ticket position is 15. See below for more instructions how to interpret the prediction results.

If we let the predictor scan the whole database of past winning numbers then it will find the best matching pattern in draws *2006/23 Sun 2nd* to *2006/24 Wed 2nd*. Their winning numbers are 12, 16 and 30. The following winning number at the second ticket position is 11. That means the predicted trend is again *decrease* and the predicted value is 11.

What happens if we increase the pattern size from three numbers to 10 numbers? The latest pattern is then 6,11,11,23,15,6,18,13,13,29. When displayed in a chart the numbers look like this:

The predictor will find best matching pattern in draws *2008/45 Sun 2nd* to *2008/48 Wed 1st* where the winning numbers are 9,20,13,21,12,8,15,15,4,27. The numbers in a chart look like this:

The following number at the second ticket position is again 11 (draw *2008/48 Wed 2nd*). That means the predicted trend is again *decrease* and the predicted value is 11.

If you compare the chart of the latest pattern and the chart of the found matching pattern above, you can see that the match is actually very loose. But it is still the best match the predictor can find in the whole database of past winning numbers. We cannot realistically expect to find a sequence of past winning numbers that is exactly the same as the ten latest draws. The longer the patterns are the less similarities between the latest pattern and the best matching pattern. So how to select the optimal pattern size?

In the examples above we used pattern size 3 which gave us predicted value 11 and pattern size 10 also with predicted value 11. In this case we have the same results. But what if the predicted values or even the predicted trends were different? How to tell which prediction is more credible?

The predictor runs a series of tests and selects the best pattern size automatically. Option *Latest draws for back-testing* in prediction settings screen defines how deep this back-testing is. If the prediction settings are for example *Pattern size min 3, max 15, Latest draws for back-testing: 10* then the predictor will make 130 predictions to pick the optimal pattern size. It will start with pattern size 3, make prediction for draw *2010/28 Sun 1st* and compare the predicted trend with actual value from the following draw *2010/28 Sun 2nd*. Then it will make prediction for draw *2010/28 Wed 2nd* and compare the predicted trend with the value from the following draw *2010/28 Sun 1st*. There will be 10 such testing predictions up to draw *2010/26 Wed 2nd*. The predictor will count how many predicted trends were correct when compared with the following draws.

Then the pattern size will increase to four and the predictor will make another ten testing predictions for ten latest draws. The count of correct trend predictions is noted. The pattern size is increased to five and the testing runs are repeated. This continues up to pattern size 15 as selected in prediction settings. Then the predictor will select the pattern size that had the highest count of correct trend predictions. This optimal pattern size is then used to make the actual prediction for the latest draw *2010/28 Sun 2nd*. In this case the best pattern size is 3 because seven trend predictions were correct during back-testing. When using pattern size 10, there were only 4 valid trend predictions out of the ten back-test runs.

▶ Hover mouse cursor above table cell with prediction result to see a tooltip with the best pattern size and the count of back-test predictions that were correct.

With option *Back-testing compares values* you can modify the prediction algorithm to select the pattern size that predicts values which are closest to the actual values when back-testing.

▶ Some lottery operators publish additional details about each draw – which set of balls has been used, which drawing machine etc. If the balls and/or machines are being changed at regular intervals it probably makes sense to use pattern sizes shorter than the interval between such changes.

Match Differences

The predictor has two modes of pattern matching. It can match either absolute values in a sequence of numbers as demonstrated above or it can match number differences instead. Let's have the following sequence of numbers:

31,35,13,20,15,5,2,10,4,25,3,10,5

Let's consider the last three numbers as the latest pattern: 3,10,5. When matching absolute values then the best matching pattern is 2,10,4 followed by number 45. However when matching number differences then the best matching pattern is 13,20,15 followed by number 5.

The same sequence of numbers expressed as value differences looks like this:

+31,+4,-22,+7,-5,-10,-3,+8,-6,+21,-22,+7,-5

So the latest pattern has changed to -22,+7,-5 and the best matching pattern is -22,+7,-5 corresponding to numbers 13,20,15 followed by number 5. So when matching differences the matching pattern must have the same shape (the order of increasing/decreasing values) as the latest pattern however all its values may be shifted up or down when compared with the latest pattern.

Now we will repeat the prediction for the second ticket number and use differences pattern matching instead of absolute values:

The best matching pattern are draws *2006/20 Wed 1st* to *2006/20 Sun 1st* with numbers 4,4,21, which translate to differences -3,0,+17. The following difference is -8.
The differences of the latest pattern are -5,0,+16. The predicted value is

29 – abs(-8 * (abs(-5/-3) + abs(0/0) + abs(16/17)) / 3 *) = 29 – 9.62 = 19.

Note that the predicted value includes correction which takes into account the differences between the latest and best matching patterns.

The same prediction with pattern size 10 will find the best matching pattern at draws *2009/24 Wed 1st* to *2009/26 Wed 2nd* where the numbers are 5,15,15,20,13,10,14,9,6,11 and the following number is 21. The prediction is *increase* to 46. This prediction is conflicting with the prediction with pattern size 3. However this prediction is a bit less credible as the back-testing passed in 5 out of 10 back test runs, while pattern size 3 predictions had 6 valid trend predictions during back-testing.

▶ It is recommended to use *differences pattern matching* especially for predictions of derived values like History sums and differences. Absolute values pattern matching is suitable for values with a small range, for example sum root, odd/even or the actual winning numbers at individual ticket positions.

Relaxed Pattern Matching

Pattern matching slider in *Predictions Options* window adjusts the weights of individual numbers when the patterns are being compared. When the slider is moved fully to the right then the pattern matching is strict and each number has the same weight.

Moving slider to the left relaxes the pattern matching as the numbers of the patterns being matched have lower weight when comparing them together. If the latest pattern is for example 6,11,11,23,15,6,18,13,13,29 then strict pattern matching may find for example pattern 9,20,13,21,12,8,15,15,4,27. With relaxed matching the best found pattern will be for example 33,16,25,14,31,11,18,12,16,30. As you can see the first few numbers of the best matching pattern match the latest pattern very loosely only. In both cases the predicted value is 10 however with relaxed pattern matching there were 9 valid back-test predictions while the strict matching produced only 7 valid predictions when back-testing on 15 latest draws. Relaxed pattern matching is recommend only when using larger pattern sizes (10 and more).

Using the Predictor

Predictions are available either from menu *Winning Numbers – Predictions* or from menu *History – Predictions*. Both menu commands start *Predictions* wizard.

1. In the first step select the past winning numbers draws to be scanned for matching patterns.
2. The second step in the wizard window selects the prediction method. Only the *Pattern Matching* algorithm is currently available.
3. The next step are options to customize the prediction algorithm. See above for more details.
4. The last step lists statistical or History values that can be predicted. Tick the items you are interested in and click button *Finish* to start the predictions.

You can track the progress of the prediction process at the lower right corner of the main window. When the process is finished the prediction results are available in [Winning Numbers Properties](#) and [Winning Numbers Charts](#) windows or in [Summary History](#) window under *Sums* and *Charts* tabs.

Interpreting the Results

 – blue triangle indicates that the predicted trend is *increase*. That means the next value is expected to be greater than the latest value. The actual predicted value is also available.

 – red triangle indicates that the predicted trend is *decrease*. That means the next value is expected to be lower than the latest value.

 – when both red and blue triangles are present in table cell then the predicted trend is *level*. That means the next value is expected to be the same as the latest value.

Note: The predictions algorithm operates just with a sequence of numbers. In some cases the predicted value can be lower or higher than the minimum or maximum possible values. In such cases you should consider the predicted trend only.

Value *n/a* in prediction results means it was not possible to make valid prediction. Usually because there are not enough data to select the matching pattern.

▶ The predicted trend should be the main indicator when estimating values for the coming draw. The actual predicted value should be only a hint showing how big the predicted increase or decrease is.

Hover mouse cursor over predicted cell to see a tooltip with additional information regarding the prediction. You can see how many back-test predictions were correct and the pattern size that has been used for predictions.

▶ It is recommended to ignore predictions with low percentage of successful back-test by entering required percentage of successful back-test into the last input field.

Additional Information

Detailed information about the prediction process is available in *Application Log*. When the predictions are finished click menu *View – Application Log*. The *Output* window then shows the following details for each predicted value. For example:

Position 2 – name of the predicted value. In this case it is the winning number at the second ticket position.

Trend prediction: Decrease – predicted trend (increase/decrease/level)

Predicted value: 10.0 – the actual predicted value. Please note that all values are zero-based so the predicted winning number is 11.

Best pattern size: 5 – the pattern size used for the prediction.

Best weight: 1.0 – the weight used for pattern matching. The weight is always 1.0 unless relaxed pattern matching has been used.

Matching pattern: [10.0 17.0 11.0 15.0 29.0] => 10.0 – the best matching pattern found. In the case the best pattern are numbers 11,18,12,16,30. The number following this pattern is 11.

Marker: 94 – the position in the sequence of numbers where the best matching pattern has been found. Value 0 means the oldest draw.

Back-tests: 15 – the count of back tests that have been carried out to validate the pattern size.

Mean Square Error: 107.66666666666667 – shows how much the back-test prediction values differ from the actual values. The lower MSE the more accurate the back-test prediction values are.

Mean Absolute Percentage Error: 0.6399601052542229 - MAPE indicator also compares the back-test predictions with the actual values.

Valid trend predictions: 6 (40.0%) - how any back tests produced correct trend prediction.

See also Trend Predictions filter.

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Sums History

This filter accepts tickets that produce *History sum differences* in given range in selected *History Levels*.

To use the filter, first click *Select* button to choose past winning numbers draws to calculate the *History* values from. Then tick *History Levels* you wish to filter in the table below and enter the desired minimum and maximum difference for each selected *Level*. Column *Sum (Prev)* shows the *History Sum* values corresponding to the latest draw from the selection of past winning numbers. Column *Difference (Prev)* is *History sum difference* corresponding to the latest draw (History sum of the latest draw minus the History sum value of the second latest draw from the selection of past winning numbers). Column *Range* shows the selected range of History values for given *Level*.
With option *At least X to Y levels must pass* you can specify the minimum and maximum count of selected *Levels* that must have the *History* value in the given range to pass the whole filter.

Optional condition *The difference in X to Y levels is at most A to B* makes the filter more strict by specifying the minimum and maximum difference for several History Levels. **Note:** If the range specified by values *A* and *B* is bigger than the ranges in all selected Levels then this additional condition has no effect on

filtering results.

See also In Range Differences statistics.

▶ You can tick/untick multiple *Levels* with a single click - select table rows you wish to modify using your mouse and then click into the *Level* column of one of the selected rows.

▶ You can increment or decrement differences in multiple table cells using your keyboard - select table cells your wish to modify and then press *CTRL+up arrow* key to increment values in all selected cell. Press *CTRL+down arrow* key to decrement values in all selected cells.

▶ You can paste the differences from system clipboard. For example highlight two rows or two columns of cells in MS Excel, press *CTRL+C* to copy the highlighted values into system clipboard, click into the table in filter window and press *CTRL+V* to paste the values as new filter parameters. Pasting a single row or a single column of cells inserts the values into both *Min* and *Max* columns respectively.

Note: When using this filter from My Estimates window, most of the filter settings are already preselected.

Example - Expert Lotto 6/49 Demo Lottery

- When filter settings are *Winning Numbers: 10 latest draws, Level 0: Min Difference 10, Max Difference 20, Level 2: Min Difference 10, Max Difference 20, Level 2: Min Difference 10, Max Difference 20, At least 3 to 3 levels must pass* then the filter accepts tickets which produce increased *History* sum values in the first three Levels:

  - 01-02-03-06-12-23 - filter accepts this ticket because its History sum values in *Levels 0* to *2* are *387, 764* and *1201* respectively. Which makes differences of *+11, +20* and *+15* when compared to the latest selected draw. All three values are in desired ranges.

  - 01-02-03-04-05-06 - filter rejects this ticket because its History sum values are *372, 759* and *1198* in *Levels 0* to *2*. Which makes differences of *-4, +15* and *+12*. Only two *Levels* are in the desired range.

- When filter settings are *Winning Numbers: 10 latest draws, Level 0: Min Difference 10, Max Difference 20, Level 2: Min Difference 10, Max Difference 20, Level 2: Min Difference 10, Max Difference 20, At least 2 to 3 levels must pass* then:

  - 01-02-03-04-05-06 - filter accepts this ticket because its History sum values are *372, 759* and *1198* in *Levels 0* to *2*. Which makes differences of *-4, +15* and *+12* and at least two *Levels* are in the desired range.

  - 01-02-03-04-05-08 - filter rejects this ticket because its History sum values are *366, 761* and *1195* in *Levels 0* to *2*. Which makes differences of *-10, +17* and *+9*. Only one *Level* is in desired range which is outside the allowed range in condition *At least 2 to 3 levels must pass*.

- When filter settings are *Winning Numbers: 10 latest draws, Level 0: Min Difference 10, Max Difference 20, Level 2: Min Difference 10, Max Difference 20, Level 2: Min Difference 10, Max Difference 20, At least 3 to 3 levels must pass, The difference in 1 to 1 levels is at least 13 to 14* then the filter accepts tickets which produce increased *History* sum values in the first three *Levels* and exactly one of those *Levels* has the difference of 13 to 14:

  - 01-02-03-06-12-36 - filter accepts this ticket because its differences are *+11, +15* and *+14* in *Levels 0* to *2*. All the differences are in the desired range 10 to 20 and also the difference in *Level 2* is in the range of 13 to 14 as specified in filter's last condition.

  - 01-02-03-06-12-23 - filter rejects this ticket because its differences are *+11, +20* and *+15* in *Levels 0* to *2*. All the difference are in desired range of 10 to 20 but there's no *Level* with the difference of 13 to 14 as specified in filter's last condition.

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Odd/Even History Sums

This filter accepts tickets that produce either *odd* or *even History Sum* values at selected *Levels*.

To use the filter first click *Select* button to choose past winning numbers draws to calculate *History* values from. Then tick the *Levels* you wish to filter in the table below. Next tick either *Odd Sum* or *Even Sum* column or both columns in selected *Levels*.

With option *Odd sum count X to Y* you can add another filtering condition stating that a ticket is accepted only if it produces at least *X* to *Y* odd sums in selected *Levels*.

▶ You can tick/untick multiple table cell with a single mouse click - first select table rows you wish to modify with your mouse then click into one of the selected cells.

Example - Expert Lotto 6/49 Demo Lottery

- When filter settings are *Winning Numbers: 10 latest draws, Level 0: Odd, Level 1: Odd, Odd sum count 0 to 2* then
  - 01-02-03-04-05-07 - filter accepts this ticket because its History sums are 349 in Level 0 and 759 in Level 1 and both sum values are odd.
  - 01-02-03-04-05-06 - filter rejects this ticket because its History sum is 372 in Level 0 which is an even number.
- When filter settings are *Winning Numbers: 10 latest draws, Level 0: Odd, Even, Level 1: Odd, Even, Odd sum count 1 to 1* then
  - 01-02-03-04-05-07 - filter rejects this ticket because its History sums are 349 in Level 0 and 759 in Level 1. Both sum values are odd which is outside allowed range.
  - 01-02-03-04-05-06 - filter accepts this ticket because its History sums are 372 in Level 0 and 759 in Level 1. So only one sum value is odd as specified in filter conditions.

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Standard Deviation of Differences

This filter accepts tickets that produce *History differences* whose standard deviation is in selected range. Low standard deviation values means that *History differences* in all *Levels* are very similar. High standard deviation values mean that *History differences* differ a lot from each other in all *Levels*.

Example - Expert Lotto 6/49 Demo Lottery

When filter settings are *Winning Numbers: 10 latest draws, Standard deviation min: 0.0, max 5.0* then:

- 01-03-09-23-28-42 - filter accepts this ticket because the standard deviation of History differences is 3.27. The History differences are: +1, +9, +7, +2, +5, +12, +8, +4, +6, +9, +8 in Levels 0 to 10. The differences are very similar hence their standard deviation is very low.

- 01-02-03-04-05-06 - filter rejects this ticket because the standard deviation of History differences is 17.25. The History differences are: -27, +15, +10, +4, -3, +22, +14, -20, +23, -16, -8. The differences range from -27 to +23 so their standard deviation is very high.

Negative/Positive History Differences

This filter accepts tickets that have desired count of negative or positive *History sum differences* in selected *Levels*.

▶ You can tick/untick multiple *Levels* with a single mouse click - first select table rows you wish to modify with your mouse then click into one of the selected cells.

Example - Expert Lotto 6/49 Demo Lottery

When filter settings are *Winning Numbers: 10 latest draws, Levels: 0, 1, 2, Negative differences count: 3 to 3, Positive differences count 3 to 3* then:

- 01-02-03-04-09-15 - filter accepts this ticket because the History differences for this ticket are: *-13, -1, -29* at Levels 0 to 2 respectively. All the differences are negative.
- 01-02-03-04-05-06 - filter rejects this ticket because the History differences for this ticket are: *-4, +15, +12* and only one of them is negative which is outside the allowed range.

Unique Sum Differences

This filter accepts tickets that have desired count of unique *History sum differences*. A *History* value is unique if it doesn't repeat in any other *Level*.

Example - Expert Lotto 6/49 Demo Lottery

When filter settings are *Winning Numbers: 10 latest draws, The count of unique history differences: 11 to 11* then:

- 01-02-03-04-05-07 - filter accepts this ticket because the History differences for this ticket are: -27, +15, +10, +4, -3, +22, +14, -20, +23, -16, -8. There are 11 unique values because none of the values repeat in any other level.
- 01-02-03-04-05-06 - filter rejects this ticket because the History differences for this ticket are: -4, +15, +12, +20, -9, +5, +12, -31, +21, -16 , -17. There are only 10 unique differences because value from Level 2 repeats in Level 6.

Segments

This filter accepts tickets with numbers that fall into selected *segments* in selected [History](#) *Level*.

To use the filter, first click *Select* button to choose past winning numbers draws to calculate *History* values from. Then pick the *Level* you wish to filter in *Level* combo box. **Note:** You can filter only one *History Level* at a time. Next tick the segments you wish to use in the filter in the table below and enter the minimum and maximum count of ticket numbers each selected segment must have. Table on the right shows the current distribution of pool numbers into *History segments* for selected *Level*.

Click *Customize* button to adjust segmentation settings for this filtering session.

Option *At least X to Y segments must pass.* allows to relax the filter condition by specifying how many selected segments must pass. For example with option *At least 2 to 3 segments must pass* the filter will also accept tickets whose numbers with into to two selected segments only.

Example - Expert Lotto 6/49 Demo Lottery

- When filter settings are *Winning Numbers: 10 latest draws, Level 0, Segment 1 (1-6): Min 2, Max 2, Segment 2 (7-12): Min 2, Max 2, Segment 3 (13 and more): Min 2, Max 2* then the filter accepts only tickets with segment combination of 2-2-2 in *Level 0*:
  - 01-02-03-04-05-07 - filter accepts this ticket, because numbers 1 and 2 are from *Segment 1*, numbers 4 and 5 are from *Segment 2* and numbers 3 and 7 are from *Segment 3* in *Level 0*.
  - 01-02-03-04-05-06 - filter rejects this ticket because it has three numbers from *Segment 1* in *Level 0* (numbers 1, 2 and 6) which is outside the allowed range.
- When filter settings are *Winning Numbers: 10 latest draws, Level 0, Segment 1 (1-6): Min 2, Max 2* then the filter accepts only tickets that have exactly two numbers in *Segment 1* in *Level 0*:
  - 01-02-03-04-05-08 - filter accepts this ticket, because numbers 1 and 2 are from *Segment 1* in *Level 0*.
  - 43-45-46-47-48-49 - filter rejects this ticket because it has just one number (47) in *Segment 1* in *Level 0*.

Segment Combinations History

This filter accepts tickets that have selected *Segment Combinations* at selected [History](#) *Levels*.

To use the filter, first click *Select* button to choose past winning numbers draws to calculate *History* values from. Then tick the *Levels* you wish to filter in the table below. Next tick the *Segment Combinations* that are required to appear in selected *Levels*.
With option *At least X to Y levels must pass* you can specify the minimum and maximum count of selected *Levels* that must have one of the selected *Segment Combinations* to pass the whole filter.
Click button *Customize* to adjust segmentation settings for the current filtering session.

☛ You can tick/untick multiple *Levels* or *Segment Combinations* with a single mouse click - first select table rows you wish to modify with your mouse then click into one of the selected cells.

Example - Expert Lotto 6/49 Demo Lottery

- When filter settings are *Winning Numbers: 10 latest draws, Levels: 0, 1, 2, Segment Combinations: 6-0-0, At least 3 to 3 levels must pass* then there's only a single ticket which has *Segment Combination 6-0-0* in the first three Levels: 06-18-23-25-29-30.

- When filter settings are *Winning Numbers: 10 latest draws, Levels: 0, 1, 2, Segment Combinations: 6-0-0, 0-6-0, 0-0-6, At least 3 to 3 levels must pass* then:

  - 06-18-23-25-29-30 - filter accepts this ticket because it has *Segment Combination 6-0-0* in all the first three Levels.
  - 01-12-24-28-36-40 - filter accepts this ticket because its *Segment Combinations* in Levels 0 to 2 are *6-0-0, 0-6-0* and *6-0-0* respectively.
  - 01-02-06-12-13-14 - filter rejects this ticket because it has only one of the selected *Segment Combinations* - 6-0-0 in Level 0.

- When filter settings are *Winning Numbers: 10 latest draws, Levels: 0, 1, 2, Segment Combinations: 6-0-0, 0-6-0, 0-0-6, At least 1 to 3 levels must pass* then:

  - 01-02-06-12-13-14 - filter accepts this ticket because it has at least one of the selected *Segment Combinations* - 6-0-0 in Level 0.
  - 01-02-03-04-05-06 - filter rejects this ticket because its *Segment Combinations* in Levels 0 to 2 are *3-2-1, 4-1-1* and *4-1-1* respectively and none of these combinations is allowed in filter's condition.

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History Number Differences

This filter accepts tickets with numbers that have *History number differences* within given range in selected *Levels*.

☛ You can tick/untick multiple *Levels* with a single mouse click - first select table rows you wish to modify with your mouse then click into one of the selected cells.

Example - Expert Lotto 6/49 Demo Lottery

When filter settings are *Winning Numbers: 10 latest draws, Levels: 0, 1, 2, Number difference: 5 to 5, Total number count: 2 to 18, Number count in a single level: 0 to 6* then the filter accepts tickets that have at least two numbers with difference of 5 in Levels 0 to 2 in [Number History](#) table:

- `01-02-03-04-05-06` - filter accepts this ticket because the History difference of number 1 in Level 0 is 5 and History difference of number 6 in Level 2 is also 5.
- `01-02-03-04-05-07` - filter rejects this ticket because it has only one number with History differences of 5, it is number 1 in Level 0.

When filter settings are *Winning Numbers: 10 latest draws, Levels: 0, 1, 2, Number difference: 5 to 5, Total number count: 3 to 18, Number count in a single level: 1 to 1* then the filter accepts tickets that have exactly one number with the difference of 5 in each Level 0 to 2 in *Number History* table:

- `01-02-03-04-06-18` - filter accepts this ticket because it has one number with the History difference of 5 in Level 0 (number 1), one number with the History difference of 5 in Level 1 (number 18) and one number with the History difference of 5 in Level 2 (number 6).
- `01-02-03-04-06-12` - filter rejects this ticket because it has two numbers with the History difference of 5 in Level 0 - numbers 1 and 12 - which is outside the allowed range.

See also History Number Differences + Odd/Even ticket filter and Number Differences summary statistics.

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History Number Differences + Odd/Even

This filter is very similar to the plain History Number Differences filter except that it adds additional condition how many matching numbers must be *odd/even*.

Example - Expert Lotto 6/49 Demo Lottery

When filter settings are *Winning Numbers: 10 latest draws, Levels: 0, 1, 2, Number difference: 5 to 5, Total number count: 2 to 18, Odd number count: 0 to 18* then the filtering results are the same as when using *History Number Differences* with settings *Winning Numbers: 10 latest draws, Levels: 0, 1, 2, Number difference: 5 to 5, Total number count: 2 to 18, Number count in a single level: 0 to 6*.

When filter settings are *Winning Numbers: 10 latest draws, Levels: 0, 1, 2, Number difference: 5 to 5, Total number count: 3 to 18, Odd number count: 3 to 3* then the filter accepts tickets that have at least 3 numbers with the History difference of 5 in Levels 0 to 2 in Number History table and exactly three of such numbers are odd:

- `01-02-03-04-25-31` - filter accepts this ticket because the numbers with the History difference of 5 are number 1 in Level 0, number 25 in Level 2 and number 31 in Level 2. All three numbers are odd.
- `01-02-03-06-25-31` - filter accepts this ticket because the numbers with the History difference of 5 are number 1 in Level 0, number 6 in Level 2, number 25 in Level 2 and number 31 in Level 2. Three of those numbers are odd.
- `01-02-03-04-05-06`- filter rejects this ticket because it does have numbers with the History difference of 5 - number 1 in Level 0 and number 6 in Level 2 - but only one of those numbers is odd which is outside the allowed range.

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Unique Number Differences

This filter accepts tickets with numbers that have selected count of unique *History number differences* within in each selected *Level*. History difference of a ticket number is unique if no other number in the filtered ticket has the same History difference value. Optionally it is possible to specify the total count of such unique differences across all selected Levels.

▶ You can tick/untick multiple *Levels* with a single mouse click - first select table rows you wish to modify with your mouse then click into one of the selected cells.

Example - Expert Lotto 6/49 Demo Lottery

Click menu *History - Latest* to display the number History values for 10 latest draws. Switch *Show as* combo box to *Differences Only* and you will see that History differences in Level 0 are:

Number	Level 0	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	Level 8	Level 9	Level 10
23	1	3	3	8	2	5	1	2	4	1	8
29	1	3	2	12	6	17	3	10	2	1	5
36	1	8	4	18	4	4	3	9	4	16	1
42	1	1	19	18	13	11	14	2	16	6	5
44	1	11	14	8	6	3	11	7	27	1	14
47	1	10	21	12	1	6	9	7	1	1	5
6	2	3	5	6	11	20	6	12	9	2	17
13	2	1	19	2	2	22	21	4	2	1	2
14	2	20	11	22	5	7	14	1	8	5	3
19	2	6	10	4	1	3	8	5	15	7	7
41	2	3	14	18	3	18	5	2	2	4	3
2	3	3	17	8	2	12	2	11	2	13	7
16	3	1	10	29	7	13	2	5	3	5	3
17	3	28	2	3	8	7	2	16	11	2	3
25	3	4	5	2	5	5	1	7	3	3	4
40	3	7	6	15	5	6	4	15	2	11	2
18	4	5	2	16	23	5	1	3	3	2	2

22	4	2	10	11	12	4	6	3	20	7	4
28	4	9	5	7	16	13	7	4	7	4	4
1	5	11	4	1	9	6	1	30	3	22	6
12	5	7	3	2	2	2	7	2	4	10	29
24	5	9	2	5	13	2	3	19	10	14	9
32	5	4	9	5	5	8	13	2	4	17	3
15	6	7	45	10	3	18	5	9	20	8	1
30	6	1	6	15	2	1	3	3	1	5	1
37	6	11	15	3	11	5	1	8	3	1	10
20	7	16	4	2	1	12	4	6	10	1	15
33	7	4	8	1	1	25	11	28	1	14	6
35	7	4	3	5	18	5	1	4	2	9	11
8	8	1	8	8	16	6	8	21	10	12	14
11	8	1	1	8	11	10	10	10	13	15	6
26	8	3	29	2	6	13	1	2	6	14	1
48	8	12	2	1	13	11	2	30	5	2	22
49	8	7	2	15	13	14	2	7	19	3	7
38	9	12	12	5	2	30	3	5	5	1	6
5	10	2	8	7	18	3	5	3	3	21	1
31	10	2	5	9	7	7	5	5	6	15	17
43	10	3	16	30	1	18	6	8	3	9	3
4	11	13	1	6	17	2	17	22	8	6	19
46	12	2	27	3	5	1	3	3	8	10	10
10	13	19	5	15	2	3	18	8	18	19	2
21	14	64	3	23	2	1	2	1	12	6	11
9	15	14	9	12	3	1	12	5	10	6	2
34	15	1	8	6	3	15	18	6	3	2	9
39	15	3	2	23	2	1	5	2	5	10	7
27	19	1	6	2	4	6	22	2	8	15	14
3	22	2	2	1	1	1	6	2	3	1	16

7	25	3	7	22	5	3	4	1	7	2	8
45	34	1	11	18	1	2	16	33	2	2	5

Please note that the table above is sorted in ascending order by column *Level 0*.

When filter settings are *Winning Numbers: 10 latest draws, Levels: 0, Unique number differences in each Level 6 to 6, Total count of unique number differences 6 to 6, At least 1 to 1 Level must pass* then each number in accepted tickets will have a different History difference in Level 0. Such a ticket is for example `01-02-03-04-05-06`
Filter rejects for example ticket `01-02-03-04-06-13` because numbers 6 and 13 have the same History difference 2 in Level 0.

When filter settings are *Winning Numbers: 10 latest draws, Levels: 0, Unique number differences in each Level 1 to 1, Total count of unique number differences 1 to 1, At least 1 to 1 Level must pass* then each number in accepted tickets will have the same History difference in Level 0. Looking at the table above we can see there are only six numbers with the same difference in Level 0: 23-29-36-42-44-47. That means the latest winning numbers.

See also Unique Number Differences statistics.

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Number Differences Sum

This filter sums *History differences* of numbers in filtered tickets and accepts those tickets that have such a sum in given range in selected *Levels*.

► You can tick/untick multiple *Levels* with a single mouse click - first select table rows you wish to modify with your mouse then click into one of the selected cells..

Example - Expert Lotto 6/49 Demo Lottery

When filter settings are *Winning Numbers: 10 latest draws, Levels: 0, 1, 2, Sum of number differences min: 10 max: 30, At least 3 to 3 levels* must pass then:
- 01-02-11-12-18-23 - filter accepts this ticket because the sum of History number differences in Level 0 is 5+3+8+5+4+1=26, the sum in Level 1 is 11+3+1+7+5+3=30 and in Level 2 it is 4+17+1+3+2+3=30. The sum in all selected Levels is within allowed range.
- 01-02-03-11-12-18 - filter rejects this ticket because the sum in Level 0 is 47, in Level 1 it is 29 and in Level 2 it is 29. Only two Levels have the sum within selected range however the filter condition requires three such Levels.

When filter settings are *Winning Numbers: 10 latest draws, Levels: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, Sum of number differences min: 40 max: 50, At least 11 to 11 levels must pass* then the filter will find just 4 tickets out of nearly 14 millions that have the sum of *History number differences* in the range of 40 to 50 in all 11 *Levels*.

See also Number Differences Sum statistical property.

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Match Past Sums

The filter accepts tickets that have the same History sum value in selected Levels as selected past draw.

Example - Expert Lotto 6/49 Demo Lottery

The History sums for the latest draw are:

Level	History Sum
0	376
1	744
2	1186
3	1670
4	1999
5	2412
6	2746
7	3158
8	3511
9	3875
10	4245

When filter settings are *Winning Numbers: 1 latest draw, Levels 0 to 10, Match at least 6 to 11 levels* then the filter will accept a single ticket 4-10-26-28-29-46. Its History sums are **376**, **744**, 1166, 1674, 1996, **2412**, **2746**, **3158**, **3511**, 3870, 4253. Six History sums are the same as in the selected latest draws.

See also Sums History filter.

Match Past Differences

The filter accepts tickets that have the same History difference value in selected Levels as selected past draw.

Example - Expert Lotto 6/49 Demo Lottery

The History differences for the latest draw are:

Level	History Sum
0	+13
1	-14
2	-27
3	+17
4	+3
5	+8
6	+12
7	-5
8	+23
9	+11
10	+31

When filter settings are *Winning Numbers: 1 latest draw, Levels 0 to 10, Match at least 5 to 11 levels* then the filter will accept only 5 tickets. One of them is for example ticket 7-13-18-26-31-41 with History differences -2, +32, **-27**, -20, **+3**, -19, **+12**, +32, **+23**, **+11**, +16 in Levels 0 to 10. Five History differences are the same as in the selected latest draw.

See also Match Past Sums filter and Sums History filter.

Sum Movement

The filter accepts tickets that produce History sums in selected Levels lower or greater than the History sums in selected past draws.

For example the History sums of the latest draw in the demo *Expert Lotto 6/49* lottery are 376, 744, 1186, 1670, 1999, 2412, 2746, 3158, 3511, 3875 and 4245 in Levels 0 to 11.

When the filter settings are *Winning Numbers: 10 latest draws, Level 0: decrease, Level 1: decrease, Level 2: decrease, Level 3: decrease, Level 4: decrease, Level 5: decrease, Level 6: decrease, Level 7: decrease, Level 8: decrease, Level 9: decrease, Level 10: decrease, At least 11 to 11 levels must pass* then the filter will select just 27 tickets from the full wheel. All these tickets will produce History sums lower than 376 in Level 0, lower than 744 in Level 1 etc.

See also History Sum Movement statistics and History Differences Movement filter.

Differences Movement

The filter accepts tickets that produce History differences in selected Levels lower or greater than the History differences in selected past draws.

For example the History differences of the latest draw in the demo *Expert Lotto 6/49* lottery are +13, -14, -27, +17, +3, +8, +12, -5, +23, +11 and +31 in Levels 0 to 11.

When the filter settings are *Winning Numbers: 10 latest draws, Level 0: decrease, Level 1: decrease, Level 2: decrease, Level 3: decrease, Level 4: decrease, Level 5: decrease, Level 6: decrease, Level 7: decrease, Level 8: decrease, Level 9: decrease, Level 10: decrease, At least 11 to 11 levels must pass* then the filter will select 475 tickets from the full wheel. All these tickets will produce History differences lower than 13 in Level 0, lower than -14 in Level 1 etc.

See also History Differences Movement statistics and History Sums Movement filter.

Negative/Positive History Differences

Negative and Positive History Differences statistics track how many analyzed draws/tickets produce negative and positive *History sum differences* in a given *Level*. The analyzer shows collected data in three ways - discrete values, values grouped by range of 5 and values grouped by range of 10.

For example 10 latest draws in Expert Lotto 6/49 Demo Lottery produce the following History sum differences in Level 0:

2010/28 Sun 2nd	+13
2010/28 Sun 1st	-3
2010/28 Wed 2nd	-13
2010/28 Wed 1st	+18
2010/27 Sun 2nd	-1
2010/27 Sun 1st	-9
2010/27 Wed 2nd	+6
2010/27 Wed 1st	+15

2010/26 Sun 2nd	+13
2010/26 Sun 1st	+22

Positive History Differences analysis shows that the most frequent positive difference is +13 which occurs in two analyzed draws. The same analysis grouped by range of 5 shows that no analyzed draw has positive difference in the range of **0 to 5**, there's one draw with the difference in the range of **6 to 10** (*2010/27 Wed 2nd*), three draws with the difference in the range of **11 to 15** etc. The same analysis grouped by range of 10 shows that the most frequent range of positive history differences is **11 to 20** as there are four such analyzed draws.

Negative History Differences analysis shows that there are four different negative values (*-3, -13, -1* and *- 9*). When the analysis results are grouped by range of 5 then the most frequent negative history difference range is **1 to 5** as there are two such draws (*2010/28 Sun 1st* and *2010/27 Sun 2nd*). Results grouped by range of 10 show that the range **1 to 10** was found in three analyzed draws.

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Segment Combinations

These statistics track the occurrences of *History segment combinations* in analyzed draws/tickets.

For example 10 latest draws in Expert Lotto 6/49 Demo Lottery produce the following segment combinations in *Level 0*:

2010/28 Sun 2nd	n/a
2010/28 Sun 1st	3-3-0
2010/28 Wed 2nd	4-0-2
2010/28 Wed 1st	3-1-2
2010/27 Sun 2nd	4-2-0
2010/27 Sun 1st	2-3-1
2010/27 Wed 2nd	1-4-1
2010/27 Wed 1st	4-1-1
2010/26 Sun 2nd	3-3-0
2010/26 Sun 1st	3-3-0

See *Segmentation* tab in Summary History window for segment combinations at other *Levels*.

Segment Combinations analysis of *Level 0* for 10 latest draws then shows that the most frequent segment combination is *3-3-0*. It hit three times in the analyzed draws and its latest occurrence was just two draws ago. Other segment combinations hit just once and many segment combination haven't been found at all in the analyzed draws, e.g. *6-0-0* or *0-0-6*. So the Occurrence column shows value of 0 in corresponding table rows.

See also filter.

Unique Sum Differences

These statistics track the count of unique *History Sum differences* in analyzed tickets. A sum difference is unique if it appears in a single *Level* only.

For example the *History differences* for the latest draw in Expert Lotto 6/49 Demo Lottery are: +13, -14, -27, +17, +3, +8, +12, -5, +23, +11, +31 in *Levels 0* to *10*. None of the values repeat in any other *Level* so there are 11 unique sum differences for this draw. The analysis of 10 latest draws in that lottery then shows that the most frequent count of unique sum differences is 10 as it was found in five out of ten analyzed draw.

The count of unique sum differences for a single draw is also available in Summary History window under *Sums* tab in *Unique Differences* column.

See also Unique Sum Differences filter.

Unique Number Differences

These statistics track how many numbers from analyzed draws/tickets have unique History number difference value in a given *Level*. A ticket number has unique *History difference* if it appears alone on a row *Segmentation* table for given *Level*.

For example the winning numbers of the latest draw in Expert Lotto 6/49 Demo Lottery look like this in Segmentation table for *Level 0* of previous draw:

1	6x	6	13	14	19	41	42
2	5x	2	16	17	25	40	
3	5x	18	22	23	28	29	
4	4x	1	12	24	32		
5	3x	15	30	37			
6	3x	20	33	35			
7	5x	8	11	26	48	49	
8	2x	36	38				
9	3x	5	31	43			
10	2x	4	47				
11	2x	44	46				
12	1x	10					
13	1x	21					
14	3x	9	34	39			
15							

Numbers 23 and 29 have the same *History difference* of 3 so there are only 5 numbers with unique *History number difference* value in that draw.

Summary analysis of *Unique Number Differences* of 10 latest draws in that lottery then shows that the most frequent count of numbers with unique differences is 5 numbers as it was found in five of the analyzed draws.

See also Unique Number Differences filter.

These statistics are available in summary form and also as per-ticket properties.

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Segment Size

These statistics track the count of pool numbers in History segments generated by analyzed tickets/draws. To count pool numbers in *History segments* for past winning numbers draws, open Summary History window, switch e.g. to *Sums* tab and toggle *Details* button. The lower part of *Summary History* window will show *Number History* and *Segmentation* details for selected draw. Switch to *Segmentation* details and the table will show numbers from the first segment with white background. Numbers from the second background have pink background and numbers from the last segment have red background.

10 latest draws - Wed 1st, Wed 2nd, Sun 1st, Sun 2nd [Select...]

[Sums] [Segmentation] [Charts] [Simulation] Show as: [History And Difference ▾] ± [Details]

Date	Numbers	Level 0	Level 1	Level 2	Level 3
2010/28 Sun 2nd	23,29,36,42,44,47 [7]	376 [+13]	744 [-14]	1186 [-27]	1670 [+1
2010/28 Sun 1st	6,13,14,19,41,42 [29]	363 [-3]	758 [-28]	1213 [-16]	1653 [+1
2010/28 Wed 2nd	2,13,16,17,25,40 [27]	366 [-13]	786 [+7]	1229 [-10]	1637 [0]
2010/28 Wed 1st	16,18,22,23,28,29 [24]	379 [+18]	779 [-17]	1239 [0]	1637 [-3;
2010/27 Sun 2nd	1,6,12,24,32,41 [44]	361 [-1]	796 [+7]	1239 [+22]	1674 [-18
2010/27 Sun 1st	2,15,22,29,30,37 [42]	362 [-9]	789 [-42]	1217 [-10]	1692 [+1
2010/27 Wed 2nd	20,23,25,30,33,35 [7]	371 [+6]	831 [+15]	1227 [+29]	1678 [+2
2010/27 Wed 1st	8,11,19,26,48,49 [18]	365 [+15]	816 [+3]	1198 [+14]	1656 [-1;
2010/26 Sun 2nd	8.11.18.32.36.38 [6]	350 [+13]	813 [-18]	1184 [-15]	1669 [+1

[Number History] [Segmentation] Level: [0 ▾]

Difference	Count	1	2	3	4	5	6
1	6x	23	29	36	42	44	47
2	5x	6	13	14	19	41	
3	5x	2	16	17	25	40	
4	3x	18	22	28			
5	4x	1	12	24	32		
6	3x	15	30	37			
7	3x	20	33	35			
8	5x	8	11	26	48	49	
9	1x	38					
10	3x	5	31	43			
11	1x	4					
12	1x	46					
13	1x	10					

Sum differences: Min=-81 Max=43

The example above shows that the latest draw in Expert Lotto 6/49 Demo Lottery has 26 numbers in *Segment 1* (there are 26 numbers with white background) and 14 numbers in *Segment 2* (numbers with pink background) and 9 numbers from *Segment 3*. *Segment Size* analysis of 10 latest draws in that lottery then for example shows that the most common size of *Segment 1* in *Level 0* is 26 numbers.

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Segment Size Repeats

The statistics show how many levels have the same segment size as 1, 2, 3 or 4 previous draws.

For example ten latest draws in the demo *Expert Lotto 6/49* lottery produce the following segment sizes in Level 2:

Draw	Segment Size 2
2010/26 Sun 1st	27-13-9
2010/26 Sun 2nd	25-15-9
2010/27 Wed 1st	26-14-9
2010/27 Wed 2nd	24-15-10
2010/27 Sun 1st	24-15-10
2010/27 Sun 2nd	23-15-11
2010/28 Wed 1st	23-15-11
2010/28 Wed 2nd	24-15-10
2010/28 Sun 1st	22-17-10
2010/28 Sun 2nd	25-13-11

From the table above we can see that the size 23 of *segment 1* in draw *2010/28 Wed 1st* repeats from the previous draw *2010/27 Sun 2nd*.

The size 15 of *segment 2* in draw *2010/28 Wed 2nd* repeats in four previous draws - from *2010/28 Wed 1st* to *2010/27 Wed 2nd*. So when analyzing Segment Size Repeats of the latest 10 draw in the demo lottery the table for *Segment 2, Repeats 4* will show *Occurrence 1* for row labeled "1". It means there is just one level (2) that has the size of segment 2 repeated in four previous draws.

See also Segment Size statistics.

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History Sums

This statistical property shows the History Sum values for tickets in the Package and for past winning numbers.

The property is added for convenience only as it provides the same information which is available in Summary History window under *Sums* tab.

History Differences

This statistical property shows the History Differences values for tickets in the Package and for past winning numbers.

The property is added for convenience only as it provides the same information which is available in Summary History window under *Sums* tab.

Odd/Even History Sums

This statistical property shows the ratio of odd History sums to even History sums for tickets in the Package and for past winning numbers.

The property is added for convenience only as it provides the same information which is available in Summary History window under *Sums* tab.

Min/Max History Differences

This statistical property shows the minimum and the maximum History Difference for tickets in the Package and for past winning numbers.

The property is added for convenience only as it provides the same information which is available in Summary History window under *Sums* tab.

Negative/Positive History Differences

This statistical property shows the count of negative and positive History Differences for tickets in the Package and for past winning numbers.

The property is added for convenience only as it provides the same information which is available in Summary History window under *Sums* tab.

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Standard Deviation of History Differences

This statistical property shows the standard deviation of History Differences for tickets in the Package and for past winning numbers.

The property is added for convenience only as it provides the same information which is available in Summary History window under *Sums* tab.

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History Differences

This statistical property shows the History Differences values for tickets in the Package and for past winning numbers.

The property is added for convenience only as it provides the same information which is available in Summary History window under *Sums* tab.

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Unique Number Differences

These statistics track how many numbers from analyzed draws/tickets have unique [History number difference](#) value in a given *Level*. A ticket number has unique *History difference* if it appears alone on a row *Segmentation* table for given *Level*.

For example the winning numbers of the latest draw in Expert Lotto 6/49 Demo Lottery look like this in [Segmentation](#) table for *Level 0* of previous draw:

1	6x	6	13	14	19	41	42
2	5x	2	16	17	25	40	
3	5x	18	22	23	28	29	
4	4x	1	12	24	32		
5	3x	15	30	37			
6	3x	20	33	35			
7	5x	8	11	26	48	49	
8	2x	36	38				
9	3x	5	31	43			
10	2x	4	47				
11	2x	44	46				
12	1x	10					
13	1x	21					
14	3x	9	34	39			
15							

Numbers 23 and 29 have the same *History difference* of 3 so there are only 5 numbers with unique *History number difference* value in that draw.

Summary analysis of *Unique Number Differences* of 10 latest draws in that lottery then shows that the most frequent count of numbers with unique differences is 5 numbers as it was found in five of the analyzed draws.

See also [Unique Number Differences](#) filter.

These statistics are available in [summary](#) form and also as per-ticket [properties](#).

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History Segments

This [statistical property](#) shows the distribution of numbers into [History](#) Segments for tickets in the Package and for past winning numbers.

The property is added for convenience only as it provides the same information which is available in [Summary History](#) window under *Segmentation* tab.

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History Number Differences

This summary statistics shows the frequency of History differences of winning numbers in analyzed draws or tickets.

Example - Expert Lotto 6/49 Demo Lottery

If we analyze all past draws in *Expert Lotto 6/49 Demo* lottery we will see that the most frequent History Number Difference in Level 0 is 1. It has been found in 750 analyzed past draws. Its latest occurrence is in the very latest draw (*2010/28 Sun 2nd*, winning number 42).
On the other hand History Number Difference 46 haven't hit yet.

You can also note that History Number Difference of value 1 is the most frequent one in all History Levels. It is because at least one winning number is very often repeated from the previous draw.

See also History Number Differences filter.

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Number Differences Sum

Shows the sum of History differences of the winning numbers of analyzed draw or ticket. The statistics are available for each History level and there is also the total sum across all levels.

Example - Expert Lotto 6/49 Demo Lottery

The latest winning numbers in Expert Lotto 6/49 Demo lottery are 23-29-36-42-44-47-[7] (draw *2010/28 Sun 2nd*). To find their History differences we must click menu *History - Summary History*, make sure *Sums* table is showing and then highlight **preceding** draw, i.e. draw *2010/28 Sun 1st*. Then toggle *Details* button to show *Number History* details for that draw in the lower part of the *Summary History* window. We can see that the winning numbers of the latest draw are highlighted with a black border. The number differences of the latest draw in Level 0 are:

Winning Number	Number Difference in Level 0
23	3
29	3
36	8
42	1
44	11
47	10
Sum:	36

The sum of all Number differences in Level 0 is 36 so the statistical property will be showing value *36* in column *Number Differences Sum 0*.

These statistics are available in summary form and also as per-ticket properties.

See also Number Differences Sum filter.

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Number Differences Sum Range

This statistics is similar to Number Differences Sum statistics except that it divides all the possible sum values into several ranges.

The values are divided into chunks of ten (1-10, 11-20, 21-30, etc), chunks of 30 (1-30, 31-60, 61-90, etc) and chunks of 50 (1-50, 51-100, 101-150, etc).

See also Number Differences Sum filter and Number Differences Sum statistics.

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In Range Differences

This statistics show how many History Differences fit into +/-10 range.

For example the latest two draws in *Expert Lotto 6/49 Demo* lottery have the following History differences:

								Level 0	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	Level 8	Level 9	Level 10
2010/28 Sun 2nd	23	29	36	42	44	47	[07]	+13	-14	-27	+17	+3	+8	+12	-5	+23	+11	+31
2010/28 Sun 1st	06	13	14	19	41	42	[29]	-3	-28	-16	+16	-35	-7	+9	+7	+25	+16	+21

You can see that in the latest draw *2010/28 Sun 2nd* there are three Levels where the History difference is in the range of -10 to +10 (highlighted with blue background). In previous draw *2010/28 Sun 1st* there are four such Levels (highlighted with green background).

If you analyze the whole winning numbers database of the *Expert Lotto 6/49 Demo* lottery you will find out that very frequently there are 4 to 5 Levels where the History differences are in the range -10 to +10.

▶ The range values are adjustable in application options under menu *Tools - Options - History - Ranges*. The default values are -10 to +10.

These statistics are available in summary form and also as per-ticket properties.

See also Sums History ticket filter - condition *The difference in X to Y levels is at most A to B* - and Difference Ranges statistics.

History Sum Movement

Shows whether the History sum value in a given draw and in given Level is greater or lower than the History sum value in previous draw. A plus sign (+) means the History sum is greater than the previous value, a minus sign (-) means the sum is lower. An equals sign (=) means the History sum is the same as in previous draw.

These statistics are available in summary form and also as per-ticket properties.

See also History Sum Movement filter and History Diff Movement statistics.

History Diff Movement

Shows whether the History difference value in a given draw and in given Level is greater or lower than the History difference value in previous draw. A plus sign (+) means the History difference is greater than the previous value, a minus sign (-) means the difference is lower. An equals sign (=) means the History difference is the same as in previous draw.

These statistics are available in summary form and also as per-ticket properties.

See also History Difference Movement filter and History Sum Movement statistics.

Consecutive Negative/Positive Differences

The statistics show the maximum count of consecutive [History] Levels that have either only negative or only positive *History differences*.

For example that latest draw *2010/28 Sun 2nd* in the demo *Expert Lotto 6/49* lottery has the following History difference values:

Level	Diff
0	13
1	-14
2	-27
3	17
4	3
5	8
6	12
7	-5
8	23
10	11
11	31

You can see that the longest section of the table above that has only negative differences is between Levels 1 and 2 (orange background). So the *Consecutive Neg Diffs* for draw *2010/28 Sun 2nd* is **2**.

The longest section of the table that has only positive differences is between Levels 3 and 6 (blue background). So the *Consecutive Pos Diffs* for draw *2010/28 Sun 2nd* is **4**.

These statistics are available in [summary] form and also as per-ticket [properties].

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Number Differences Sum

Shows the sum of History differences of the winning numbers of analyzed draw or ticket. The statistics are available for each History level and there is also the total sum across all levels.

Example - Expert Lotto 6/49 Demo Lottery

The latest winning numbers in Expert Lotto 6/49 Demo lottery are 23-29-36-42-44-47-[7] (draw *2010/28 Sun 2nd*). To find their History differences we must click menu *History - Summary History*, make sure *Sums* table is showing and then highlight **preceding** draw, i.e. draw *2010/28 Sun 1st*. Then toggle *Details* button to show *Number History* details for that draw in the lower part of the *Summary History* window. We can see that the winning numbers of the latest draw are highlighted with a black border. The number differences of the latest draw in Level 0 are:

Winning Number	Number Difference in Level 0
23	3
29	3
36	8
42	1
44	11
47	10
Sum:	**36**

The sum of all Number differences in Level 0 is 36 so the statistical property will be showing value *36* in column *Number Differences Sum 0*.

These statistics are available in summary form and also as per-ticket properties.

See also Number Differences Sum filter.

History Differences Repeat

The statistics show how many History differences repeat in the same Level from previous draws. The statistics are given for repeats from a single previous draw and for repeats from 5, 10, 15, 30 and 50 previous draws.

For example draw *2010/27 Sun 1st* in the demo *Expert Lotto 6/49* lottery has two History differences repeated from the previous five draws. The History difference 14 in Level 3 repeats from draw *2010/26 Sun 2nd* and History difference 6 in Level 6 repeats from the previous draw *2010/27 Wed 2nd*.

These statistics are available in summary form and also as per-ticket properties.

History Difference Ranges

The statistics show whether a *History difference* in a given Level is in pre-defined of -10 to +10, above that range or below that range. The value range is adjustable in application options under menu *Tools - Options - History - Ranges*. The default values are -10 to +10.

Value *"in range"* means that the History difference value is in pre-defined range. Value *">"* means the difference is above the pre-defined range, value *"<"* means the differences is below the pre-defined range.

These statistics are available in summary form and also as per-ticket properties.

See also In Range Differences statistics.

Manage Playslips

Menu command *Tools - Playslips* opens *Playslips* window listing all playslip layouts that are available for current lottery. Playslip layout is a template defining how to print ticket numbers to paper playslips.

There are two types of playslip layout:

- **Playslips shipped with Expert Lotto** - a fresh installation of Expert Lotto includes playslip layouts for various lotteries from around the world. Some of them were designed by Expert Lotto team directly, others were contributed by Expert Lotto users (see *Created by* field in this window). These playslips are read-only and cannot be removed from playslip database. New playslips are continuously being added through application updates. Out-dated playslips are removed through application updates as well.

- **User-created playslip layouts** - you can create new playslips or modify existing ones using Playslip Layout wizard. Each of user-created playslips is stored in a single file on your disk, usually in the same folder as the lottery they are designed for (see *File location* field in this window). The playslip files have *.playslip* extension. You can share custom playslips with other Expert Lotto users. You can also email the playslip layout to Expert Lotto development team to have it included in the next application update.

The playslips are listed in a table with two columns. The first column shows playslip layout name - usually the same as the name of the lottery the playslip is designed for. The second column shows the country the lottery is being played in. Click any column header to sort the list alphabetically. The details of the selected playslip are shown in the fields beneath the table.

Use the buttons next to the table to manage the playslip database:

- **Make default** - marks the selected playslip layout as the default one. This layout will be preselected when printing package tickets to paper playslip using menu command *Package - Print to playslips*.
- **New** - starts New Playslip Layout wizard where you can setup a new playslip template for the current lottery. When the wizard is finished the newly created playslip is stored in a *.playslip* file on your disk and listed in this window.
- **Edit** - opens Edit Playslip Layout wizard to modify the settings of an existing playslip layout. When customizing a playslip, which ships with Expert Lotto then you'll be prompted for a file name to save the modified playslip to when the wizard is finished. Customizing a user-created playslip just stores the changes to an existing *.playslip* file.
- **Add from file** - adds a *.playslip* file to the database. Clicking this button opens file browser window where you can choose the playslip file to be added. You can use this feature to import playslip layouts received by email from other Expert Lotto users or downloaded from internet. This way you can also re-add playslips accidentally removed by *Remove* button.
- **Remove** - deletes selected playslip layout from the playslip layout database. This button is enabled only for user-created playslips, you cannot remove any playslip shipped with Expert Lotto installation. Clicking the button does **NOT** delete the actual playslip file on your disk, it only removes the file reference from playslip database. Use *Add from file* button to re-add playslips deleted by mistake.
- **Report as out-dated** - opens an email window you can use to notify the Expert Lotto development team that the selected playslip is no longer valid. This happens usually when the lottery commission issues new version of paper playslips and/or when the lottery rules changes, for example there are more or less numbers in the pool. This button is not enabled for user-created playslips.
- **Show extended list** - by default this window shows only playslips that are suitable for the current lottery. That means the number of boxes in each playslip panel corresponds to the size of number pool(s) in current lottery. Use this option to display all playslips in Expert Lotto database. However if you play e.g. *x/49* lottery then printing to playslip designed for e.g. *x/35* lottery means that numbers greater than 35 won't be printed out.

Note: Deleting any *.playslip* file using e.g. file manager application also removes the playslip layout reference from the database on next application startup.

Playslip Setup Wizard

Playslip Layout Wizard opens from Playslips window. It can be used to design a new playslip layout or to customize an existing one. The playslip design consists of several steps:

1. Name

Enter playslip name and the name of the country the lottery is being played in. The playslip name should usually match the name of the lottery it is being designed for.

Also select the measurement units you will be using when entering playslip dimensions.

2. Playslip Size

Playslip width and playslip height refer to the width and height of the whole paper playslip respectively.

Single number box dimension define the width and height of a small square that is used to mark a single ticket number on the playslip. You can choose the shape and color of the mark in appropriate combo boxes.

Important: Turn the paper playslip to align the numbers in playslip's grids in the same way as displayed in Ticket Panel window before taking any measurements! The position of the lowest number, the ordering of numbers (left-to-right, top-to-bottom) and the number of columns and rows must match exactly the *Ticket Panel* window otherwise the ticket numbers will be printed at wrong positions.

3. Panel Dimensions

Pool numbers are usually arranged into a grid with several columns and rows. Enter the width and height of the grid into edit fields. When designing playslip layout for a Powerball lottery you must also enter the dimensions of grids for powerball numbers.

Note: The current lottery defines the number of columns, the number of rows and the ordering of numbers in each grid. If these settings do not match the paper playslip you need to first create a new lottery before designing its playslip layout.

4. Panels Layout

Select how many tickets you can print to a single paper playslip. Then enter the location of each number grid. When designing playslip layout for a Powerball lottery you must also enter the location of grids for powerball numbers.

5. Extra Boxes

Extra boxes on a playslip are usually used to select the amount of money to bet or how many times the bet should repeat. First enter the count of such boxes on your playslip then enter the location of each box. Also provide descriptive names for extra boxes - they will show in Print to playslips window.

6. Page Numbers

When printing to playslips it is possible to print also the indexes of tickets printed on the playslip. It might be useful when printing to a large number of playslips and one or more playslips failed to print correctly, e.g. because the paper loader didn't load the playslip straight. Then you can print again just the playslips that failed instead of re-printing the whole batch of playslips.

Enter the location where the ticket numbers should be printed at. You should pick a location that doesn't affect number grids otherwise the printed playslip may be rejected by scanning machine in lottery agent shop.

7. Layout Review

Finally review the complete playslip layout and make sure it matches the actual paper playslip. Click button *Print* to make a test print out to a plain letter size paper and try matching the printed sheet with the paper playslip. If the test printout differs from the paper playslip use button *Previous* in the wizard window to repeat the wizard's step and fix the errors.

▶ Hover mouse cursor above edit fields in wizard window to see an image tooltip providing a visual hint which measurements are to be taken.

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What are Number Groups?

Number groups divide all or selected pool numbers into several sub-pools or groups. Usually the whole number pool is divided into evenly sized groups and tickets are analyzed to see how many groups their numbers fall in. Ticket filter accepting tickets that have (not) numbers in selected groups is also available.

There are two types of number groups:

- **Range groups** - each group is a continuous range of numbers, e.g. 1-10, 11-20, 21-30 etc. The groups may also overlap and do not have to cover the whole number pool. So in a x/49 lottery you can define number groups like this: 1-10, 20-35, 30-49
- **Discrete numbers groups** - each group is a set of hand-picked numbers, e.g. 1-2-10-11-49, 3-4-5-6, 1-2-39-41-48-49. Note that a number can be included in more than one group.

You can define several named sets of number groups using Number Groups Manager. The number groups are then available in Number Groups filter and statistics.

Manage Number Groups

Number Groups Manager window opens from menu *Tools - Number Groups*. In this window you can see a list of all number groups defined for the current lottery. Use the buttons at the top of the window:

- ✚ **Add** - start Number Groups Wizard to create a new number group.
- ✚ **Hot/Cold** - create new number group based on hot/cold/warm numbers, see below.
- 🗁 **Import** - create new number from a text file, see below. This option is not available for Pick-N lotteries.
- 🗋 **Duplicate** - create a copy of selected number group. Changes made to the copied number group do not affect the original number group it was copied from.
- 📝 **Customize** - opens selected number group in Number Groups Wizard window to modify number group settings.
- 🗑 **Remove** - permanently deletes the selected number group.
- ⬆ ⬇ - moves selected number group up or down in the list. The order of number groups affects the order of columns in Winning Numbers Properties and Package Properties windows. So reordering the number groups allows to see some number groups stats side by side in those windows.
- 🔽 **Filter** - opens Package filter window for the selected number group. The button is enabled only when there are any tickets in the Package.

Hot/Cold Number Groups

It is possible to create number groups consisting of *hot, cold* and *warm* numbers. First select past draws to calculate hot/cold numbers from. Then choose how many of those draws should be used to find hot numbers. Next you need to specify the minimum occurrence of hot numbers and the minimum occurrence of

warm numbers. The actual distribution of pool numbers into hot/cold and warm categories is given in the table at the bottom of the window.

For example ten latest draws in *Expert Lotto 6/49* demo lottery are:

2010/28 Sun 2nd	**23**	**29**	36	42	44	47	[07]
2010/28 Sun 1st	06	13	14	19	41	42	[29]
2010/28 Wed 2nd	02	13	16	17	25	40	[27]
2010/28 Wed 1st	16	18	22	**23**	28	**29**	[24]
2010/27 Sun 2nd	01	06	12	24	32	41	[44]
2010/27 Sun 1st	02	15	22	**29**	30	37	[42]
2010/27 Wed 2nd	20	**23**	25	30	33	35	[07]
2010/27 Wed 1st	08	11	19	26	48	49	[18]
2010/26 Sun 2nd	08	11	18	32	36	38	[06]
2010/26 Sun 1st	05	06	11	31	40	43	[32]

Let's use the following settings to create Hot/Cold/Warm groups:

- *Draws:* **10 latest draws**
- *Draw limit for hot numbers:* **4**
- *Min occurrence of hot numbers before draw limit:* **2** *After draw limit:* **1**
- *Min occurrence of warm numbers:* **2**

It means the hot/cold numbers will be calculated from the occurrences of pool numbers in the latest 10 draws (see the table above). The *draw limit* field divides the table into two parts. The latest 4 draws have orange background, the previous six draws have blue background.

A number is **hot** if it hit at least two times in the orange section (*before draw limit*) and at least once in the blue section (*after draw limit*). In this example there are only two such numbers - 23 and 29.

If we change the settings to *Min occurrence of hot numbers before draw limit:* **2** *After draw limit:* **0** then there will be five hot numbers - 13, 16, 23, 29, 42. They are numbers that hit at least twice in the orange section.

A number is **warm** if it isn't hot and if it hit at least two times in the selected ten past draws. There are 16 such numbers, for example 2, 6, 8, 11 etc.

All other numbers are **cold** - they hit at most once in the latest ten draws. There are 31 cold numbers in this example - 1, 3, 4, 5, 7, 9 etc.

Note: Number groups created this way are static - so when you add fresh winning numbers into your database you have to create new *Hot/Cold* numbers groups to take the latest numbers into account.

Importing Number Groups From File

Clicking 🗁 Import button in Manager's window toolbar opens standard Open file window where you can browse a text file that will be converted into a new set of discrete number groups. The file being imported is expected in the following format:

- each line represents a single group of numbers
- values on each line must be separated with comma (,), semicolon (;), dash (-) or space or tabulator char

- the first value in each line will be used as number group name
- values that are not numbers or duplicate numbers or numbers out of pool range are ignored
- lines starting with # character are ignored and can be used for comments

After successful file import it is possible to remove or edit the original imported file - the numbers groups created by the import action will remain unchaged.

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Number Groups Wizard

The wizard window opens from the Number Groups Manager either to create a new number group or to customize an existing one.

1. Step

First select how many groups you want to divide the pool numbers into. Then choose whether you want to have continuous range of numbers in each group or whether you want to have hand-picked numbers in each group.

- **Number ranges** - use spinner fields to select the first and the last number in each group. The number ranges may overlap and you don't have to cover the whole number pool range when defining number groups.
- **Discrete numbers** - click *Select* button next to each number group field to open Ticket Panel window where you can select group numbers using your mouse. The numbers from one group may be present in other group(s) as well. You should also enter a descriptive name for each group to be shown in Number Groups filter window.
  Option *Applies to main ticket numbers only* specifies how ticket's bonus numbers (if any) are evaluated. When this option is on then only ticket's main numbers are checked whether they belong to the given number group. When this option is off then also ticket's bonus numbers (drawn from the same pool as the main numbers) may appear in the number group.

2. Step

Enter the name for the set of number groups. This name will show in *Number Groups Manager* window and in *Number Groups* filter window. By default all new *Number Groups* are available in *Number Groups* filter. If you also want to see statistics of distribution of ticket numbers into the number groups, select options *Show in Analyzers* and/or *Show in Statistical properties*. Option *Show in Number matrix windows* adds a new layout to Package Matrix and Winning Numbers Matrix windows where you can see visual representation of selected number groups.

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Predictions

The goal of all lottery strategies is the prediction of winning numbers that will hit in the next draw. Lottery players in most cases search for the most frequent or the least frequent numbers, then examine the latest winning numbers and/or their statistical properties trying to guess what is the most likely to happen in the next draw.

Expert Lotto has built-in tool which automates the prediction process to some extent. The application will search through selected past draws and compare them with the latest winning numbers to predict the numbers and statistical properties that are expected in the coming draw. As all other Expert Lotto features, the predictions are based on solid math. With the same input data and the same settings the predictor will always provide the same, reproducible results. There is no magical black-box spitting out different numbers each time it is clicked. Expert Lotto predictor is based on *pattern matching* algorithm which is widely used in many other computer-assisted fields – facial recognition, statistical data analysis, signal processing etc.

Pattern Matching

The following table lists 15 latest draws in Expert Lotto 6/49 lottery in descending order:

Date	Position 1	Position 2	Position 3	Position 4	Position 5	Position 6	Bonus
2010/28 Sun 2nd	23	29	36	42	44	47	7
2010/28 Sun 1st	6	13	14	19	41	42	29
2010/28 Wed 2nd	2	13	16	17	25	40	27
2010/28 Wed 1st	16	18	22	23	28	29	24
2010/27 Sun 2nd	1	6	12	24	32	41	44
2010/27 Sun 1st	2	15	22	29	30	37	42
2010/27 Wed 2nd	20	23	25	30	33	35	7
2010/27 Wed 1st	8	11	19	26	48	49	18
2010/26 Sun 2nd	8	11	18	32	36	38	6
2010/26 Sun 1st	5	6	11	31	40	43	32
2010/26 Wed 2nd	4	18	26	33	35	47	11
2010/26 Wed 1st	5	12	25	31	44	46	33
2010/25 Sun 2nd	10	15	28	30	36	43	35
2010/25 Sun 1st	16	21	24	25	35	46	47
2010/25 Wed 2nd	9	12	23	34	39	49	24

The latest three numbers at the second ticket position are: 13, 13 and 29. Those three numbers form the *latest pattern*. The pattern size is 3 as it consists of three numbers.

Now we will search the past winning numbers at the second ticket position and look for a similar pattern. The table above shows that the best *matching past pattern* can be found in draws *2010/26 Sun 2nd* to *2010/27 Wed 2nd*. The past winning numbers are 11, 11 and 23. The following draw is *2010/27 Sun 1st* where the second winning number is 15. So the prediction for the coming draw *2010/29 Wed 1st* is number 15 at the second ticket position.

Let's verify our prediction in Expert Lotto:

1. Open Expert Lotto 6/49 Demo lottery.
2. Click menu *Winning Numbers – Predictions* to open *Predictions* wizard window.
3. Choose *15 latest winning numbers* in the first step, click button *Next*.
4. Select *Pattern Matching* prediction type, click button *Next*.
5. Choose prediction settings as on the picture below. Click button *Next*.

6. Make sure *Ticket Positions* under *Positional statistics* is selected, click button *Finish*.

[Winning Number Properties](#) window opens and its table will show the following value in *Position 2* column:

Date	Numbers	Position 1	Position 2	Position 3	Position 4	Position 5	Position 6
Prediction		2	15	22	33	35	43
2010/28 Sun 2nd	23,29,36,42...	23	29	36	42	44	47
2010/28 Sun 1st	6,13,14,19,...	6	13	14	19	41	42
2010/28 Wed 2nd	2,13,16,17,...	2	13	16	17	25	40
2010/28 Wed 1st	16,18,22,23...	16	18	22	23	28	29

The downward red triangle indicates that the predicted trend is *decrease* in the next draw and the number predicted for the second ticket position is 15. See below for more instructions how to interpret the prediction results.

If we let the predictor scan the whole database of past winning numbers then it will find the best matching pattern in draws *2006/23 Sun 2nd* to *2006/24 Wed 2nd*. Their winning numbers are 12, 16 and 30. The following winning number at the second ticket position is 11. That means the predicted trend is again *decrease* and the predicted value is 11.

What happens if we increase the pattern size from three numbers to 10 numbers? The latest pattern is then 6,11,11,23,15,6,18,13,13,29. When displayed in a chart the numbers look like this:

The predictor will find best matching pattern in draws *2008/45 Sun 2nd* to *2008/48 Wed 1st* where the winning numbers are 9,20,13,21,12,8,15,15,4,27. The numbers in a chart look like this:

The following number at the second ticket position is again 11 (draw *2008/48 Wed 2nd*). That means the predicted trend is again *decrease* and the predicted value is 11.

If you compare the chart of the latest pattern and the chart of the found matching pattern above, you can see that the match is actually very loose. But it is still the best match the predictor can find in the whole database of past winning numbers. We cannot realistically expect to find a sequence of past winning numbers that is exactly the same as the ten latest draws. The longer the patterns are the less similarities between the latest pattern and the best matching pattern. So how to select the optimal pattern size?

In the examples above we used pattern size 3 which gave us predicted value 11 and pattern size 10 also with predicted value 11. In this case we have the same results. But what if the predicted values or even the predicted trends were different? How to tell which prediction is more credible?

The predictor runs a series of tests and selects the best pattern size automatically. Option *Latest draws for back-testing* in prediction settings screen defines how deep this back-testing is. If the prediction settings are for example *Pattern size min 3, max 15, Latest draws for back-testing: 10* then the predictor will make 130 predictions to pick the optimal pattern size. It will start with pattern size 3, make prediction for draw *2010/28 Sun 1st* and compare the predicted trend with actual value from the following draw *2010/28 Sun 2nd*. Then it will make prediction for draw *2010/28 Wed 2nd* and compare the predicted trend with the value from the following draw *2010/28 Sun 1st*. There will be 10 such testing predictions up to draw *2010/26 Wed 2nd*. The predictor will count how many predicted trends were correct when compared with the following draws.

Then the pattern size will increase to four and the predictor will make another ten testing predictions for ten latest draws. The count of correct trend predictions is noted. The pattern size is increased to five and the testing runs are repeated. This continues up to pattern size 15 as selected in prediction settings. Then the predictor will select the pattern size that had the highest count of correct trend predictions. This optimal pattern size is then used to make the actual prediction for the latest draw *2010/28 Sun 2nd*. In this case the best pattern size is 3 because seven trend predictions were correct during back-testing. When using pattern size 10, there were only 4 valid trend predictions out of the ten back-test runs.

▶ Hover mouse cursor above table cell with prediction result to see a tooltip with the best pattern size and the count of back-test predictions that were correct.

With option *Back-testing compares values* you can modify the prediction algorithm to select the pattern size that predicts values which are closest to the actual values when back-testing.

▶ Some lottery operators publish additional details about each draw – which set of balls has been used, which drawing machine etc. If the balls and/or machines are being changed at regular intervals it probably makes sense to use pattern sizes shorter than the interval between such changes.

Match Differences

The predictor has two modes of pattern matching. It can match either absolute values in a sequence of numbers as demonstrated above or it can match number differences instead. Let's have the following sequence of numbers:

31,35,13,20,15,5,2,10,4,25,3,10,5

Let's consider the last three numbers as the latest pattern: 3,10,5. When matching absolute values then the best matching pattern is 2,10,4 followed by number 45. However when matching number differences then the best matching pattern is 13,20,15 followed by number 5.

The same sequence of numbers expressed as value differences looks like this:

+31,+4,-22,+7,-5,-10,-3,+8,-6,+21,-22,+7,-5

So the latest pattern has changed to -22,+7,-5 and the best matching pattern is -22,+7,-5 corresponding to numbers 13,20,15 followed by number 5. So when matching differences the matching pattern must have the same shape (the order of increasing/decreasing values) as the latest pattern however all its values may be shifted up or down when compared with the latest pattern.

Now we will repeat the prediction for the second ticket number and use differences pattern matching instead of absolute values:

The best matching pattern are draws *2006/20 Wed 1st* to *2006/20 Sun 1st* with numbers 4,4,21, which translate to differences -3,0,+17. The following difference is -8.

The differences of the latest pattern are -5,0,+16. The predicted value is

29 – abs(-8 * (abs(-5/-3) + abs(0/0) + abs(16/17)) / 3 *) = 29 – 9.62 = 19.

Note that the predicted value includes correction which takes into account the differences between the latest and best matching patterns.

The same prediction with pattern size 10 will find the best matching pattern at draws *2009/24 Wed 1st* to *2009/26 Wed 2nd* where the numbers are 5,15,15,20,13,10,14,9,6,11 and the following number is 21. The prediction is *increase* to 46. This prediction is conflicting with the prediction with pattern size 3. However this prediction is a bit less credible as the back-testing passed in 5 out of 10 back test runs, while pattern size 3 predictions had 6 valid trend predictions during back-testing.

▶ It is recommended to use *differences pattern matching* especially for predictions of derived values like History sums and differences. Absolute values pattern matching is suitable for values with a small range, for example sum root, odd/even or the actual winning numbers at individual ticket positions.

Relaxed Pattern Matching

Pattern matching slider in *Predictions Options* window adjusts the weights of individual numbers when the patterns are being compared. When the slider is moved fully to the right then the pattern matching is strict and each number has the same weight.

Moving slider to the left relaxes the pattern matching as the numbers of the patterns being matched have lower weight when comparing them together. If the latest pattern is for example 6,11,11,23,15,6,18,13,13,29 then strict pattern matching may find for example pattern 9,20,13,21,12,8,15,15,4,27. With relaxed matching the best found pattern will be for example 33,16,25,14,31,11,18,12,16,30. As you can see the first few numbers of the best matching pattern match the latest pattern very loosely only. In both cases the predicted value is 10 however with relaxed pattern matching there were 9 valid back-test predictions while the strict matching produced only 7 valid predictions when back-testing on 15 latest draws. Relaxed pattern matching is recommend only when using larger pattern sizes (10 and more).

Using the Predictor

Predictions are available either from menu *Winning Numbers – Predictions* or from menu *History – Predictions*. Both menu commands start *Predictions* wizard.

1. In the first step select the past winning numbers draws to be scanned for matching patterns.
2. The second step in the wizard window selects the prediction method. Only the *Pattern Matching* algorithm is currently available.
3. The next step are options to customize the prediction algorithm. See above for more details.
4. The last step lists statistical or History values that can be predicted. Tick the items you are interested in and click button *Finish* to start the predictions.

You can track the progress of the prediction process at the lower right corner of the main window. When the process is finished the prediction results are available in Winning Numbers Properties and Winning Numbers Charts windows or in Summary History window under *Sums* and *Charts* tabs.

Interpreting the Results

 – blue triangle indicates that the predicted trend is *increase*. That means the next value is expected to be greater than the latest value. The actual predicted value is also available.

 – red triangle indicates that the predicted trend is *decrease*. That means the next value is expected to be lower than the latest value.

 – when both red and blue triangles are present in table cell then the predicted trend is *level*. That means the next value is expected to be the same as the latest value.

Note: The predictions algorithm operates just with a sequence of numbers. In some cases the predicted value can be lower or higher than the minimum or maximum possible values. In such cases you should consider the predicted trend only.

Value *n/a* in prediction results means it was not possible to make valid prediction. Usually because there are not enough data to select the matching pattern.

▶ The predicted trend should be the main indicator when estimating values for the coming draw. The actual predicted value should be only a hint showing how big the predicted increase or decrease is.

Hover mouse cursor over predicted cell to see a tooltip with additional information regarding the prediction. You can see how many back-test predictions were correct and the pattern size that has been used for predictions.

▶ It is recommended to ignore predictions with low percentage of successful back-test by entering required percentage of successful back-test into the last input field.

Additional Information

Detailed information about the prediction process is available in *Application Log*. When the predictions are finished click menu *View – Application Log*. The *Output* window then shows the following details for each predicted value. For example:

Position 2 – name of the predicted value. In this case it is the winning number at the second ticket position.

Trend prediction: Decrease – predicted trend (increase/decrease/level)

Predicted value: 10.0 – the actual predicted value. Please note that all values are zero-based so the predicted winning number is 11.

Best pattern size: 5 – the pattern size used for the prediction.

Best weight: 1.0 – the weight used for pattern matching. The weight is always 1.0 unless relaxed pattern matching has been used.

Matching pattern: [10.0 17.0 11.0 15.0 29.0] => 10.0 – the best matching pattern found. In the case the best pattern are numbers 11,18,12,16,30. The number following this pattern is 11.

Marker: 94 – the position in the sequence of numbers where the best matching pattern has been found. Value 0 means the oldest draw.

Back-tests: 15 – the count of back tests that have been carried out to validate the pattern size.

Mean Square Error: 107.66666666666667 – shows how much the back-test prediction values differ from the actual values. The lower [MSE](#) the more accurate the back-test prediction values are.

Mean Absolute Percentage Error: 0.6399601052542229 - [MAPE](#) indicator also compares the back-test predictions with the actual values.

Valid trend predictions: 6 (40.0%) - how any back tests produced correct trend prediction.

See also [Trend Predictions](#) filter.

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Number Coloring

Number Coloring is a tool to enhance visual perception of ticket numbers displayed in various tables.

Example:

1. Open lottery Expert Lotto 6/49.
2. Click menu *Winning Numbers - Show As - Table*.
3. Click *Select* button in *Winning Numbers Table* window and select *All draws*.
4. Click *Date* column header to sort the draws in descending order.
5. Highlight the 10 latest draws in the table.
6. Press *On/Off* button in number coloring toolbar to turn the number coloring on:

The winning numbers table will look like this:

Date							
2010/28 Sun 2nd	23	29	36	42	44	47	7
2010/28 Sun 1st	6	13	14	19	41	42	29
2010/28 Wed 2nd	2	13	16	17	25	40	27
2010/28 Wed 1st	16	18	22	23	28	29	24
2010/27 Sun 2nd	1	6	12	24	32	41	44
2010/27 Sun 1st	2	15	22	29	30	37	42
2010/27 Wed 2nd	20	23	25	30	33	35	7
2010/27 Wed 1st	8	11	19	26	48	49	18
2010/26 Sun 2nd	8	11	18	32	36	38	6
2010/26 Sun 1st	5	6	11	31	40	43	32
2010/26 Wed 2nd	4	18	26	33	35	47	11
2010/26 Wed 1st	5	12	25	31	44	46	33
2010/25 Sun 2nd	10	15	28	30	36	43	35
2010/25 Sun 1st	16	21	24	25	35	46	47
2010/25 Wed 2nd	9	12	23	34	39	49	24
2010/25 Wed 1st	1	6	22	24	34	40	33
2010/24 Sun 2nd	8	12	23	31	37	49	27
2010/24 Sun 1st	11	19	28	29	32	39	30
2010/24 Wed 2nd	12	25	27	33	35	41	20
2010/24 Wed 1st	1	5	27	33	39	48	36
2010/23 Sun 2nd	1	12	24	33	38	42	11

You may note that for example number 4 in draw *2010/26 Wed 2nd* has white background. That is because number 4 hasn't been found in the selected 10 latest draws. On the other hand number 18 in the same draw has blueish background to indicate that it appears two times in the selected draws. Number 6 in draw *2010/25 Wed 1st* has yellow background which means it was drawn three times within the latest 10 draws.

This way you can quickly evaluate the frequency of each pool number in the selected set of draws or tickets because number coloring generated from winning numbers table is automatically transferred to other application windows displaying draws, tickets or just separate ticket numbers. If you find number coloring too distracting you can turn it off by clicking *On/Off* button in the toolbar:
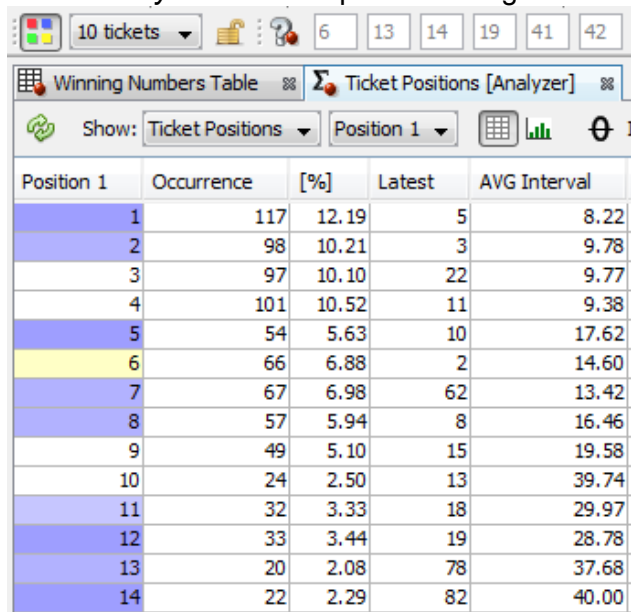
You can also hide number coloring toolbar using menu *View - Toolbars - Number Coloring* to turn it off.

Click menu *Tools - Options - Number Coloring - Ticket Tables* to customize the default colors. The options window also contains switch *Include bonus numbers*. When this switch is turned off then the number frequency coloring will be calculated from the main numbers of selected tickets only.

Switching Windows

The current number coloring depends on current active window. For example:

1. Generate number coloring from 10 latest draw by following the example above.
2. Click menu *Winning Numbers - Analyze* to start a New Analyzer wizard.
3. Click button *Select* in the wizard window to select *All draws* and click button *Next*.
4. Pick *Ticket Positions* from the *Available Statistics* list and click button *Finish*.
5. A new *Analyzer* window opens showing the occurrences of pool numbers at the first ticket position for the whole lottery history:

Position 1	Occurrence	[%]	Latest	AVG Interval
1	117	12.19	5	8.22
2	98	10.21	3	9.78
3	97	10.10	22	9.77
4	101	10.52	11	9.38
5	54	5.63	10	17.62
6	66	6.88	2	14.60
7	67	6.98	62	13.42
8	57	5.94	8	16.46
9	49	5.10	15	19.58
10	24	2.50	13	39.74
11	32	3.33	18	29.97
12	33	3.44	19	28.78
13	20	2.08	78	37.68
14	22	2.29	82	40.00

Note that the table automatically shows the current number coloring and the combo box in number coloring toolbar reads *10 tickets* - which are 10 latest draws selected in *Winning Numbers Table*.

6. Sort the table by the *Occurrence* column and select six numbers that appear most frequently at the first ticket position:

Note that the selected numbers are highlighted with yellow color and number coloring combo box shows the new selection.

7. Switch back to *Winning Numbers Table* window and the number coloring will change back to the 10 latest draws.
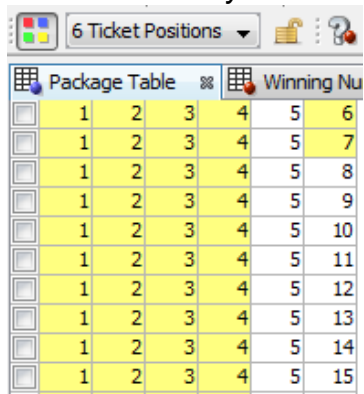
8. Click menu *Package - Insert - Full Wheel* and insert 1000 tickets with numbers 1 to 49 into the Package. Note that the ticket panel also displays the current coloring.

9. Click menu *Package - Show As - Table* to open Package Table window:

The ticket numbers are colored according to number occurrences in 10 latest draws selected in *Winning Numbers Table* window.

10. Activate the *Analyzer* window - number coloring changes to highlight 6 selected numbers. Now switch back to *Package Table* window:

Number coloring always picks the colors from the last active window that has any tickets or numbers selected.

If you want to disable automatic number coloring updates when switching windows, click *Lock* button in number coloring toolbar: 🔓

That makes the current number coloring permanent until you click *Unlock* button again: 🔒

Built-in Number Coloring

Besides the number coloring based on the occurrences of selected numbers you can also choose one of the built-in number coloring schemes using combo box in number coloring toolbar:

- **High/Low** - highlights high numbers with blue color and low numbers are highlighted with green background.
- **Odd/Even** - adds blue background to odd numbers and green background to even numbers.
- **Hot/Cold** - highlights numbers that were drawn frequently in the last few draws with red background, numbers that didn't come up in the latest draws have blue background. Click menu *Tools - Options - Number Coloring - Hot/Cold* to customize colors and latest draws selection.
- **Missing Numbers** - this number coloring highlights the numbers that are NOT present in the Package. This type of number coloring is visible only in Ticket Panel window and in History Segmentation tables.
- **Numbers after Cut-off** - highlights winning numbers from the draw that follows the current Cut-off draw date. It is very useful when back-testing various filters.

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What If...

"What if these numbers came up in the next draw?" That is the question asked very frequently when a lottery strategy is being tested or when numbers are being selected for the next draw.

Use menu *View - Toolbars - What If* to toggle *What-If* toolbar on, then click on/off button on the toolbar:
Now you can enter numbers into edit fields in the toolbar and observe other application windows to see how various statistics and charts would change if the entered numbers came up in the next draw. It is basically the same as if a temporary draw with the given numbers was added to winning numbers database.

More convenient usage of *What-If* feature is selecting a ticket in any window showing a table of tickets or draws. For example you can open Package Table window and select any ticket in the table to use its numbers as *What-If*. Then you can analyze changes in e.g. winning numbers charts or History tables.

Note: *What-If* numbers are automatically synchronized with the last active window containing a table of tickets. When switching between such windows the what-if numbers will change accordingly. You can click *Lock* button in *What-If* toolbar to make the current what-if numbers permanent:
Then the what-if numbers remain the same regardless which window is activated. To turn automatic synchronization of what-if numbers on again, click *Unlock* button in *What-If* toolbar:

▶ When entering numbers from keyboard prepend single-digit numbers with zero to automatically move input focus into the next number field. For example enter "01" instead of "1".

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Cut-off Draw Date

When cut-off draw date is set then the winning numbers for the given draw and all following draws are *'hidden'* from the winning numbers database and will not show in any application window. This is very useful for back-testing of your lottery strategies. You can hide one or more latest draws and then investigate, which combination of filters yields the expected winning numbers.

The cut-off draw date is adjustable in the main toolbar area. First toggle the cut-off date on by clicking this button , then choose the desired date in the combo box next to it. All draws with selected date and all following draws won't show in any application window except for the Winning Numbers Manager. If the toolbar isn't showing click menu *View - Toolbars - Cut-off Draw Date* to turn it on. Another way to temporarily hide some draws is offered in Winning Numbers Manager window.

▶ When the cut-off draw date is on then you can hover your mouse above the combo box in the toolbar to see the winning numbers of the selected draw.

To see again all the draws from the winning numbers database click button again or turn the cut-off date toolbar off using menu *View - Toolbars*.

▶ When cut-off draw is active then draw selection fields start with a star sign (*) to indicate that some draws are hidden.

See also Number Coloring Numbers after Cut-off

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Draw Date Pre-Filter

If a lottery draws winning numbers only in certain days of the week or if there are multiple sets of winning numbers on each day then this tool allows to select which days or draws are included in the selection of past winning numbers. These settings are applied before any [selection of past draws](#) throughout the whole application.
This way it's easily possible to filter or analyze particular draws or days of week without adjusting your saved [complex filters](#) or [custom analyzers](#).

The draw date pre-filter is adjustable in the main toolbar area. First toggle the pre-filter on by clicking this button ☑, a dialog window will pop up where you can tick the draw(s) or day(s) you are interested in. Draws and days that are not ticked in this window won't show in any application window except for the [Winning Numbers Manager](#). If the toolbar isn't showing click menu *View - Toolbars - Draw Date Pre-Filter* to turn it on.

To work again with all the draws from the winning numbers database click ☑ button again or turn the toolbar off using menu *View - Toolbars*.

▶ When draw date pre-filter is active then [draw selection](#) fields start with a star sign (*) to indicate that some draws are hidden.

See also [Draw Date Cut-off](#)

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Ticket Panel

Ticket Panel window is accessible from menu *Tools - Ticket Panel*. It shows pool numbers aligned to a grid with the same shape as on the actual paper playslip.

When a single ticket is selected in a Package window ([Table](#), [Matrix](#), [Properties](#) or [Winnings](#)) then its numbers are displayed in this window as crosses on appropriate number boxes.

Likewise, when a single draw is selected in a winning numbers window ([Table](#), [Matrix](#), [Properties](#) or [Charts](#)) then its main numbers and bonus or power numbers are displayed in this window as crosses on appropriate number boxes.

When a *Package Matrix* or *Winning Numbers Matrix* window is active then you can click any number box to toggle the highlight of that number in the matrix window.

Note: When playing a lottery which draws all main numbers from a single pool it is possible to define [custom layout](#) for the Ticket Panel window by clicking *Edit* button in the lower right corner

Note: Boxes with dark background represent masked ticket positions.

Note: Bonus or powerball numbers use a different marker shape.

You can click ✏️ button to right of the ticket panel to clear all the numbers in the ticket panel. Use ❌ button to tick all highlighted numbers.

Find Ticket

This action is available from menu *Edit - Find*.

You can use it to find a ticket with given numbers in a ticket table:

1. Click into window showing Package tickets ([table](#), [matrix](#), [properties](#) or [winnings](#)) or to [Complex Filter](#) results table to make sure it is the active window.
2. Click menu *Edit - Find* to open *Find Ticket* window.
3. Enter the numbers of the ticket you are searching for and click button *Find*.
4. If the given ticket is found then the Package window will highlight it, otherwise you'll see message that the ticket cannot be found.
5. Click button *Find Next* to find a next ticket with the same numbers.

Note: You can use the same steps to find a past draw with given numbers in any of Winning Numbers windows ([table](#), [matrix](#) or [properties](#)).

Exporting Tables

You can export any table in any application window using menu command *File - Export*. This opens *Export Table* window where you can choose the output format:

- **CSV Text File** - this is a plain text file which lists each table row on a separate line. Cell values are separated with a separator character (see [Export options](#)). Most spreadsheet processor can open and correctly import CSV files.
- **MS Excel XLS File** - this is native format of *Microsoft Excel 97* application. This file format can hold at maximum 65535 rows and 255 columns. If the table being exported is larger then table cells outside this range won't be exported.

You can also choose whether you want to export all table rows or only the rows that are selected in the exported table. The last option allows opening the exported file in the application that is assigned as the default one for the selected file format in your operating system.

Click button *Export* to open standard file browser window and select the folder and file name to export the table to.

Note: In some cases you have to first click into the table you wish to export to have the menu command enabled.

Table Printing

You can print any table in any application window using menu command *File - Print*. This opens *Print Table* window where you can specify print options.

- **Zoom** - select zoom factor to use when printing the table. Values higher than 100% make the printed table larger and easier to read, values lower than 100% make the printed table smaller so you can fit more text on a single sheet of paper.
- **Orientation** - choose paper sheet orientation - *portrait* or *landscape*.

Click button *Print* to print the table on the default printer, click button *Options* to select a different printer and/or adjust printer settings.

Note: In some cases you have to first click into the table you wish to print to have the menu command enabled.

Import Lottery from Expert Lotto 4.x

If you were using **Expert Lotto version 4.x** to play a lottery that isn't listed on Expert Lotto web site, for example a custom created lottery, you must first import that lottery into Expert Lotto 5. The lottery format has changed in Expert Lotto 5 and you cannot directly open a lottery from version 4.x in Expert Lotto 5 without converting it to a new format.

1. Click menu *File - Import Lottery* to open *Import Lottery* window.
2. Click *Browse* button next to *Import from* field to select folder containing the lottery in Expert Lotto version 4.x format. The usual location of lottery folders in version 4.x is *C:\ExpertLotto\data* on Windows 7 and Windows Vista or *C:\Program Files\ExpertLotto\data* on Windows XP.
3. You will see the name and the description of the selected lottery in the fields below.
4. Click *Browse* button next to *Save to* field to pick folder the lottery will be imported to. The selected folder must be empty.
5. Click *Import* button to finish the import.
6. If the import was successful you will be prompted to open the lottery in Expert Lotto 5.

Payout Settings

This options panel allow adjustments of winning payouts. The table lists all winning prizes as define in lottery settings and in the second columns are the default payouts for the given prize. Double-click any cell to enter a new value.

Field *Single ticket cost* show how much you must pay to play a single ticket.

You can also adjust the currency format. The default value comes from the settings of your operating system.

Values in this options panel are used to calculate the total winnings, net profit and the cost of the whole bet in Package Winnings and in Summary Winnings windows respectively.

Also *Performance* tab in Complex Filter window shows the possible net profit if the tickets accepted by the filter were bet in past draws.

Note: This options panel opens from menu *Tools - Options - Miscellaneous - Payouts*.

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Ticket Tables

When one or more tickets are highlighted in any ticket table window then the background color in ticket table cells changes to reflect the occurrences of numbers in highlighted tickets. It is called **Number Coloring** and serves as a tool for better visual perception of ticket numbers.

In this options panel you can adjust colors that are assigned to individual number frequencies. Click the colored circle for appropriate number frequency to open color picker window and choose a different color.

If you don't want to use *Number Coloring* for a particular frequency then untick the appropriate check box. Then the numbers with the given frequency will have the default background color - usually white.

Note: This options panel is available from menu *Tools - Options - Number Coloring*.

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Hot/Cold Numbers Options

In this options panel you can adjust the settings for [Number Coloring](#) based on [hot/cold](#) numbers. The settings also apply to [Hot/Cold Numbers](#) statistics.

- **Scan for hot/cold numbers in** - select the past draws whose ticket numbers will define the hot/cold numbers. The selection should include several latest draws for the best results.
- **Maximum frequency of cold numbers** - defines the maximum occurrence of a drawn number in the selected draws to be declared as *cold*. When the options is set to e.g. "2" then all numbers there were drawn twice, once or not at all in the selected past draws will be assigned to the cold category. Such numbers will be highlighted with blue background in ticket tables when Hot/Cold Number Coloring is active. Click the colored circle to the right to pick a different color.
- **Minimum frequency of hot numbers** - defines the minimum occurrence of a drawn number in the selected draws to be declared as *hot*. When the options is set to e.g. "5" then all numbers there were drawn five or more times in the selected past draws will be assigned to the hot category. Such numbers will be highlighted with red background in ticket tables. Click the colored circle to the right to pick a different color.

Note: This options panel opens from menu *Tools - Options - Number Coloring - Hot/Cold*.

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Execution Options

- **Number of threads for long running tasks** - most of Expert Lotto tasks (ticket filtering, calculation of statistics etc) are broken up into several execution threads to improve the application performance. This option defines how many threads will be created for each long running task. The number of threads should match the count of processing cores of your CPU. For example if you have a dual-core CPU then select 2 threads per task. For a quad-core CPU you should enter 4 threads per task. Using higher numbers of execution threads will not yield any performance boost because major part of CPU time will be wasted on thread synchronization.
- **Number of tickets to process in memory** - when tickets are being process (e.g. filtered) in most cases the application must load the tickets from a file first. To improve the performance tickets are buffered into operational memory to avoid slow I/O operations. This option defines how many tickets are held in memory for a single running task. You can increase this number but remember that a buffer for 10000 tickets in a 6/xx lottery occupies about 68KB of RAM and the application needs memory for other operations as well.
- **Log application activity** - if this options is on then the application records all your important actions, for example which filters have been applied, which tickets have been loaded into the Package etc. This might be useful when you need to review the steps you've made during the current Expert Lotto session. You can open the application log from menu *View - Application Log*. Then look for lines starting with `INFO [ACTIVITY]`
- **Play sound when a long running task is finished** - toggle this option to get audio signal when long a running task (for example a complex filter) is finished. Use *Browse* button to select WAV sound clip.

Note: This options panel opens from menu *Tools - Options - Miscellaneous - Execution*.

Import/Export Options

Imports

- **Field separators** - is a [regular expression](#) which is used to split a line of text into several fields containing ticket numbers when loading CSV or text files into the Package. Basically it's a list of commonly used separator characters like comma "," or semicolon ";" separated by "|" character. The default value is ;|,| |-

Exports

- **Field separator** - is a character used to separate ticket numbers when saving tickets to a plain text or CSV file.
- **Prepend single digit numbers with zeros** - if this option is on then tickets will be saved to a text file for example like this:
  ```
  01,02,05,07,23
  03,09,14,19,34
  08,09,23,35,41
  12,15,21,34,40
  ```
  When the option is off then the tickets will be saved as:
  ```
  1,2,5,7,23
  3,9,14,19,34
  8,9,23,35,41
  12,15,21,34,40
  ```

Note: This options panel opens from menu *Tools - Options - Miscellaneous - Imports & Exports*

Chart Options

This options panel allows customization of chart windows.

- **Maximum number of points in a chart** - defines the maximum range of chart's horizontal axis. If you set this value for example to 1000 and then select 1200 latest draws to be shown in winning numbers [charts](#) then the chart will show only the latest 1000 draws.

- **Default lower/upper range values** - this options applies to chart's [range tool]. When the range tool is turned on then its initial range will be chart's average value +/- the given percentages of the average value.
- **Open chart exports in the default application** - when this option is ticked then charts exported as images files (menu *File - Export*) will open automatically in the default application associated with image files in your operating system.
- **Colors** - in this section you can change the default chart colors by clicking the appropriate colored circle.
  - Default - the color of chart's primary data curve.
  - Average value - the color of the line marking chart's average value.
  - Median value - the color of the line marking chart's median value.
  - Linear fit - the color of [linear fit] line.
  - Moving average 1, Moving average 2, Moving average 3- the colors of [moving average] lines.
  - Background - the color of chart window background. It is recommended to select white background if you want to print export chart images.
  - Grid lines - the color of horizontal grid lines.

Note: This options panel opens from menu *Tools - Options - Charts*.

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Requesting New Online Source

When requesting a new source for winning numbers online update you must provide the following information:

- Lottery name
- Lottery web site address
- Winning numbers download link

The link must point to a downloadable file with complete history of winning numbers in a plain text or CSV format. It isn't possible to provide online update of winning numbers from a web page which does show a table of past winning numbers but also some menus, advertisements, various links etc. Even a slightest change in HTML formatting can break the parsing process or even introduce errors into winning numbers database.

After clicking *OK* button the application will check that the download links is valid (internet connection is required) and then open an email window addressed to the Expert Lotto development team. After receiving this email Expert Lotto developers will implement the new online source and provide it as an application update.

**Note:** The actual implementation time depends on available development resources.

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License Key Activation

When you download and install Expert Lotto then the application runs in unregistered free mode where some of the advanced features are disabled. The unregistered version of Expert Lotto provides enough features to satisfy most lottery players. You can track past winning numbers, check your winnings, create, load and save wheels, analyze statistics and many more. However if you are really into lottery cracking business you should consider registering your copy of Expert Lotto to get access to its advanced and unique features (read more [here](#)). To unlock the disabled features and use application's full potential, you must enter license key.

If you have already received your Expert Lotto license key by email then follow these instructions to register your copy of Expert Lotto.

1. Select menu *Help - Enter License Key* to start *License Key Activation* wizard.
2. Open email with your license key and highlight the license key text using your mouse. **Note:** The license key text starts with **LICENSE_BEGIN** and ends with **LICENSE_END**. Make sure you've selected the whole license key text including those two words.
3. Copy the selected text to system clipboard. You can use *CTRL+C* keyboard shortcut on any MS Windows operating system.
4. Switch back to Expert Lotto and paste the license key text into the *License Key Activation* window. You can use *CTRL+V* keyboard shortcut on any MS Windows operating system or press 📋 button at the top-right corner of *License Key Activation* window.
5. Make sure that the whole license key text is copied in, including the starting *LICENSE_BEGIN* and ending *LICENSE_END*. As the license key text is very long, it may appear on multiple lines. For example:
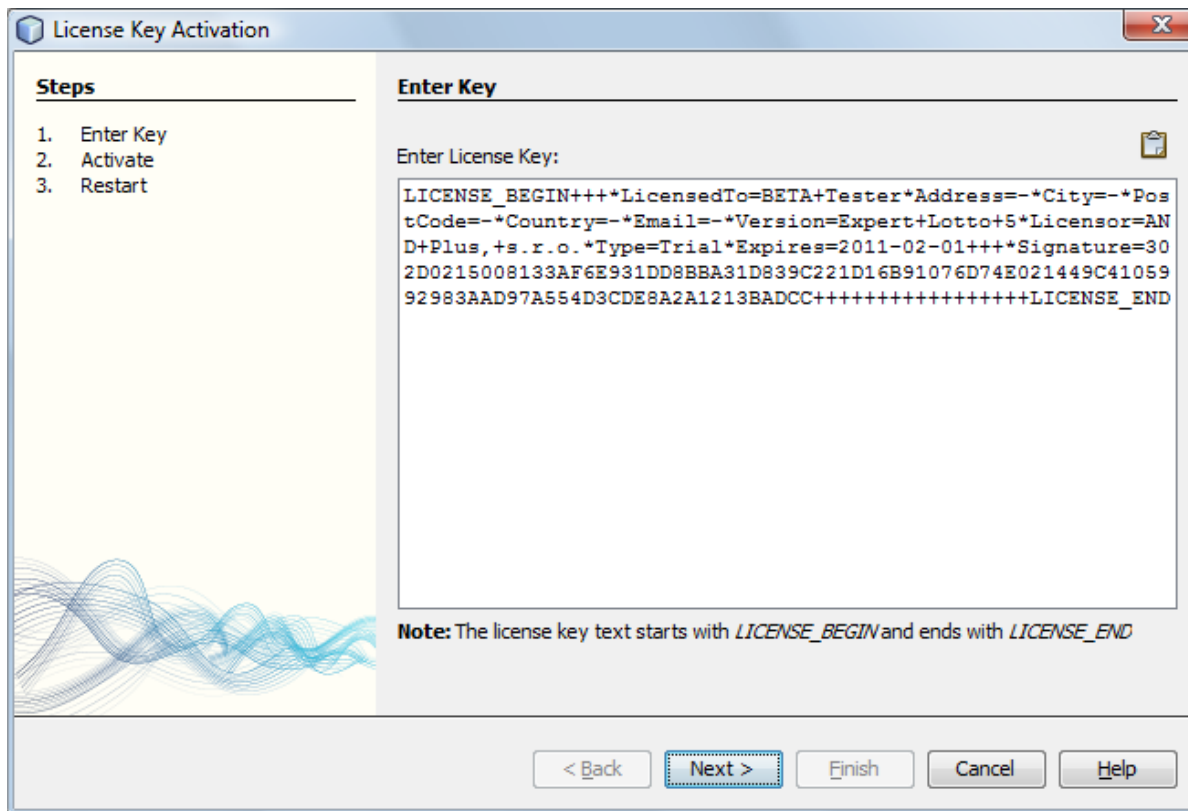
6. Click button *Next* button to continue.

7. If you have entered a valid license key, the wizard will show your until when you will be receiving free application updates. If you have entered trial license key, the wizard will show you when the trial expires. If you have entered an expired registration key, the wizard will prompt you to enter license renewal key in the next step.

8. Click button *Next* button to continue. The activation will prompt you to restart the application to finish the activation of your license key.

When the application is successfully registered the *About* window (menu *Help - About)* shows your name, street address, email and other registration details you've entered when obtaining the license key.

Note: It is not recommended to enter the license key by typing it directly from keyboard as it is very error prone because the license key text is very long.

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Statistics Options

Charts

Options *Moving average* specify the count of data points to calculate moving average values in winning numbers charts and in interval sequence charts respectively.

Statistical Properties

In this options panel you can customize Package Properties and Winning Numbers Properties windows. Use check boxes in *Package properties* and in *Winning numbers properties* lists to show or hide statistical properties. Each item in the list corresponds to one column (or several column in case of positional statistical properties) in *Package Properties* or *Winning Numbers Properties* windows respectively.

▶ It is possible to change the columns visible in statistical tables by clicking *Columns* button in their upper left corners. That opens Select Columns window where you can tick the statistical properties you wish to see.

Draws settings at the bottom of the options window selects past draws for statistical properties which are based on winning numbers. For example selecting *10 latest draws* means that statistical properties like *Repeating Numbers* will search for repeating numbers in the 10 latest draws.

Option *Decimal places* defines the count of decimal places to be used in statistical tables.

Option *Show table row numbers in a tooltip* applies to statistical tables in Analyzer window. When this option is on then hovering mouse cursor over any analyzer table row shows the row number in a tooltip. This can be useful especially when evaluating statistical tables with a large number of rows.

Combined Statistics

This panel lists Combined Statistics that are available for the current lottery. Click button *Add* to setup new combined statistics. The button opens a new window where you can combine up to five different statistical properties together. Use combo boxes to select the desired statistics and enter some descriptive name for the new statistics into *Title* field. The name will then shown in statistical tables and charts. Click button *Ok* and analyze past winning numbers draws or tickets in the Package to see the values of the new combined statistics.

To customize existing combined statistics, first select them in the list, then click button *Modify*.

To create a copy of existing combined statistics, first select them in the list, then click button *Duplicate*.

Button *Remove* permanently deletes the selected combined statistics. If you (accidentally) remove all combined statistics, the application will automatically recreate the default ones which are included in default Expert Lotto distribution.

Buttons *Move Up* and *Move Down* change the position of select combined statistics. The order of statistics in the list matches the order of statistics in *Ticket Properties* window and in *Package Properties* and *Winning Numbers Properties* windows.

Backgrounds

Option *Show background colors in statistical properties tables* toggles cell background colors for Winning Numbers Properties and Package Properties tables respectively to allow easier perception of displayed values. When turned on each table column will have different background color. If the table has more than 10 column then the colors sequence will repeat. The colors are adjustable by clicking the colored buttons.

Vertical Pairs Sum

This panel allows to select up to three draw distances for Vertical Pairs Sum statistical properties in Winning Numbers Properties and Package Properties windows.

Note: This options panel opens from menu *Tools - Options - Statistics*.

Replace Ticket

Replace Ticket window opens from menu *Edit - Replace*. You can use it to change the numbers of a selected ticket in the Package. The numbers being replaces are shown in read-only boxes at the top of this window. Enter new ticket numbers into edit fields or click appropriate boxes in the Ticket Panel to select new ticket numbers.

Button *Replace* changes the ticket numbers in currently selected ticket only. Button *Replace All* scans the whole Package and replaces the numbers of all tickets with the same numbers as the selected ticket. When finished the status bar at the bottom of the main application window shows the count of replaced tickets.

Note: The menu command is enabled only when a Package window is activated (Table, Matrix, Winnings, Properties) and just one ticket is selected in Package table.

Filter Reference

Filter reference is a link to complex filter stored on your disk. With filter references you can link multiple complex filters with each other.
Click *Browse* button to select a different complex filter filter.
Click *Edit* button to open the referenced complex filter in a new window.

Analyzer Wizard

Tickets Analyzer wizard opens from menu *File - New - Analyzer*. You can use it create a new *Analyzer* window.

The wizard consists of three steps:

Tickets

Select tickets to be analyzed by clicking *Select* button.

▶ Use menu *Package - Analyze* to analyze tickets in the Package or use menu *Winning Numbers - Analyze* to analyze past draws and skip the first step in *Ticket Analyzer* wizard.

Intervals

Select past draw to use for draw interval analysis. If you don't need draw interval information, untick *Analyze intervals of past winning numbers* option. The ticket analysis will be much faster and less memory expensive.

Statistics

Select statistics you wish to analyze.

Click *Finish* button to open *Analyzer* window and calculate the selected statistics.

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Combined Statistics

With combined statistics it is possible to group up to five different statistics into a new, single statistical property and thus track the combination of statistical properties as a single event. Expert Lotto ships with three predefined combined statistics:

- Odd/Even + Low/High
- Sum Root + Odd/Even
- Sum Root + Low/High

Use menu *Tools - Options - Statistics* to define new combined statistics or to customize the existing ones.

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History Level Synchronization

When History Level Synchronization is turned on in the main menu (*History - Synchronize Levels*) then all History-related windows will automatically switch to have the same Level selected.

Example

- Click menu *History - Synchronize Levels* to turn History Level synchronization on.
- Click menu *History - Summary* to display *Summary History* window and switch to *Charts* tab.
- Click menu *History - My Estimates* to display *My Estimates* window.
- Switch back to *Summary History* window and select for example Level 8 in *Level* combo box. You will see that *My Estimates* window automatically selected row for Level 8 so that you can see your current estimates at the bottom of that window.
- Switch to *My Estimates* window and select for example row for Level 3. You will see that *Summary History* window automatically switched to chart for Level 3.
- If you need to compare data from different Levels, simply click menu *History - Synchronize Levels* again to turn automatic History Level Synchronization off.

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Keyboard Shortcuts

This options panel opens from menu *Tools - Options - Keymap* and you can use it to customize keyboard shortcuts.

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Column Selection

This window opens after clicking *Columns* button in the upper left corner of Winning Numbers Properties window or Package Properties window.

The window shows a list of all available statistical properties. Each row in this window corresponds to one or more columns in the statistical table. Only ticked items show in the statistical table. You can use this window to quickly adjust visible columns to reduce clutter in statistical tables.

The combo box at the top of the window lists some pre-defined column selections - *All, Basic, Positional, History*. If you make a custom selection by ticking and unticking appropriate table rows the save button will activate. Press the button to create a custom named column selection that will be then available in the

combo box. This way you can create several column selections and switch between them very quickly using the combo box. To remove a custom column selection click the delete button next to the combo box.

▶ You can tick/untick multiple items with a single click. First highlight the rows you wish to (un)tick - you can press Ctrl+A to select all rows. Then tick/untick one of the selected rows - all of the selected rows will be ticked/unticked as well.

You can even change the order of columns and thus more easily compare various statistical properties with each other. To change the order of columns in statistical table simply drag and drop table rows into desired position.

See also Statistics Options.

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Invalid Filter Settings

This screen shows in Custom Analyzer window when there was an error while accessing analyzed data. Click menu *View - Application Log* and check application messages in *Output* window for possible problems. Also make sure you are using the latest version of Expert Lotto - click menu *Help - Check for updates*.

If the problem persists even in the latest version of the application, please contact Expert Lotto support team.

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Edit Panel Layout

This window opens after clicking either *Add New* or *Modify* button in Panel Layouts window.

The window shows a table where each cell represents a single box in the ticket panel layout. The count of rows and columns is adjustable using appropriate spinner fields.

Select one or more table cell using your mouse and press *Delete* key to clear their numbers. Click into any cell and type the number that should be showing at the location in the ticket panel. The numbers can be entered in any order and not every cells must contain a number.

Enter a short descriptive name into *Name* field. This name will be showing in *Layouts* combo box in Ticket Panel window.

Note: Custom ticket panel layout can show main ticket numbers only, Powerball numbers will not show in any custom ticket panel layout.

Expert Lotto Documentation

Expert Lotto is a universal lottery software suitable for any numerical lottery. Expert Lotto supports:

- **Jackpot** lotteries which draw all winning numbers from the same pool, optionally an extra bonus number(s) are also drawn from the same pool.
- **Keno** lotteries which draw all winning numbers from the same pool but less numbers are marked on a bet-slip.
- **Powerball** lotteries which draw main winning numbers from the same pool and one or more additional numbers from a different pool(s).
- **Pick-3** / **Pick-4** / Pick-N lotteries which draw each winning number from a separate pool.

With Expert Lotto you can easily handle and automate any of the following tasks:

- Track and manage past winning numbers
- Create, import, export wheels
- Print to paper playslips
- Check your winnings
- Statistically analyze past winning numbers
- Find the Jackpot winning numbers using unique History features
- Implement advanced lottery strategies using Complex Filters and Custom Analyzers

There are many features in Expert Lotto to help you with the selection of numbers for the next draw and to improve your bet/win balance. The results of all functions are always reproducible because there is solid math behind every Expert Lotto feature. The application is not a black box providing different results each time the same function is used.

This documentation provides detailed description and explanation of all Expert Lotto features. Just press *F1* key at any time while working with Expert Lotto to see how to use the current application screen or window in these help pages. It is strongly recommended to read through the *Getting Started* section of this manual before using Expert Lotto. Also visit our online tutorials where you can find practical, step-by-step instructions for some of the most common tasks. You can also share your experience with other Expert Lotto users in our discussion board.

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Edit Lottery Settings

Menu *Tools - Lottery - Edit* starts *Edit Lottery Setting* wizard where you can modify some of settings of currently opened lottery.

You can adjust the following lottery settings:

- lottery name and description
- draw schedule, e.g. which days of week the winning numbers are drawn on
- winning combinations, e.g. when the lottery commission changes the prize break-down
- ticket panel layout, e.g. when the lottery commission issues new type of paper playslips.

You cannot change the lottery type, e.g. switch from Jackpot to Powerball, draw date type, number pool size and the count of main and bonus numbers.

When the wizard is finished a new lottery will be created. The new lottery will have the same set of past winning numbers as the current lottery.

There are several steps when editing lottery settings:

1. Name

Enter the name for the modified lottery, short description and lottery web site address. This info will show in application's About box (menu *Help - About - Lottery*).

2. Schedule

1. Select which day a new week starts on by clicking appropriate button. This option is required to correctly order the draws in various tables and lists.
2. Choose which days of week the numbers are drawn on.
3. Some lotteries draw multiple sets of winning numbers on the same day. For example there are mid-day and evening draws in some Pick 3 lotteries. Use the combo box to define the count of number sets and enter number set names into the appropriate fields.
4. The lottery start date is for convenience only as it is used to find draws that are missing in your winning numbers database.

Make sure that these settings actually match the draw schedule of your lottery. Otherwise you might have problems when importing past winning numbers or when updating your winning numbers database online.

3. Winning Combinations

Choose which combinations of matching numbers are the winning ones by ticking the *Is Winning?* column. Highlight any matching combination in the table and use *Move Up* and *Move Down* buttons to move it up or down in the list.
You can also change the default prize names in the *Prize* column by double-clicking the appropriate table cell and typing a new name.

4. Ticket Panel

Define the layout of numbers in a ticket panel to match the paper playslip. If you are creating a powerball lottery you must define panel layout for additional pool(s) as well.
Although these settings are not mandatory and you can keep wizard's default values there is a filter and statistics that are based on ticket panel layout.

5. Destination

Click button *Browse* to select the folder the modified lottery will be stored in. The selected folder must be empty.

Click button *Finish* to finish the *Edit Lottery* wizard. The wizard will create a new lottery using the settings you've just modified and the same winning numbers database as the current lottery. The current lottery with old settings still remains on your hard disk. If you are certain you will never need the old lottery setup you can simply remove the older lottery folder.

Read more on lottery management [here](#).

Draw Simulation

Draw simulation is available in [Latest History](#) window and [Summary History](#) window. It calculates and collects History sums for a selected set of number combinations and presents them as a histogram table and chart. The histogram then shows what is statistically most likely to happen with History values in the next draw.

Click button ⊙ to open [Simulation Draws](#) window to select the number combinations to be used as simulated winning numbers and start the draw simulation process.

When the draw simulation is finished, the results are presented in a table in the upper half of the window. Each table row contains the results for a single History Level. The tables columns are:

- **Latest** - the latest History value for given Level. Use button *Select* at the top of the window to choose a different section of winning numbers database to be used for History calculations.
- **Trend** - shows how many simulated draws produced History sum greater than the latest (*increase*) or lower than the latest sum value (*decrease*). For example, value *increase [61%]* means that 61% of simulated draws would produce positive *History Difference* (sum value greater than the latest sum) if they were actually drawn in the coming draw. Value e.g. *decrease [54%]* means that majority of simulated draws would produce negative *History Difference* (sum value lower than the latest sum) if they were actually drawn in the next draw.
- **Median** - median History sum/difference. This particular value corresponds to the half of the range between the maximum value of positive deviation (the first „6" numbers with the smallest deviation) an the maximum value of negative deviation (the last 6 numbers with the greatest deviation) in certain level
- **Most Frequent** - the History sum/difference that was produced most often during the simulation. Corresponds to blue bar in simulation histogram chart.
- **AVG** - the average History sum/difference. It means that half of the simulated results are lower than this value and the other half of simulated results are greater than the median value.
- **StdDev** - standard deviation of History differences produced during the simulation.
- **Min** - the lowest History sum/difference found in simulation results.
- **Max** - the highest History sum/difference found in simulation results.
- **Range** - the total range of History values in a given Level. *Max - Min = Range*

▶ Toggle button ± to show draw simulation results as differences from the latest draw, toggle Σ() button to show simulation results as absolute sum values.

▶ Click any column header to sort the table in ascending or descending order.

The lower part of the window is histogram chart showing draw simulation results for selected Level. A section of that chart is automatically transferred to *Simulation* hint in My Estimates window:

The figure below shows the simulation histogram for Expert Lotto 6/49 Demo lottery generated from all possible combinations:

13,983,816 combinations of 6 numbers from a pool of 49 numbers.
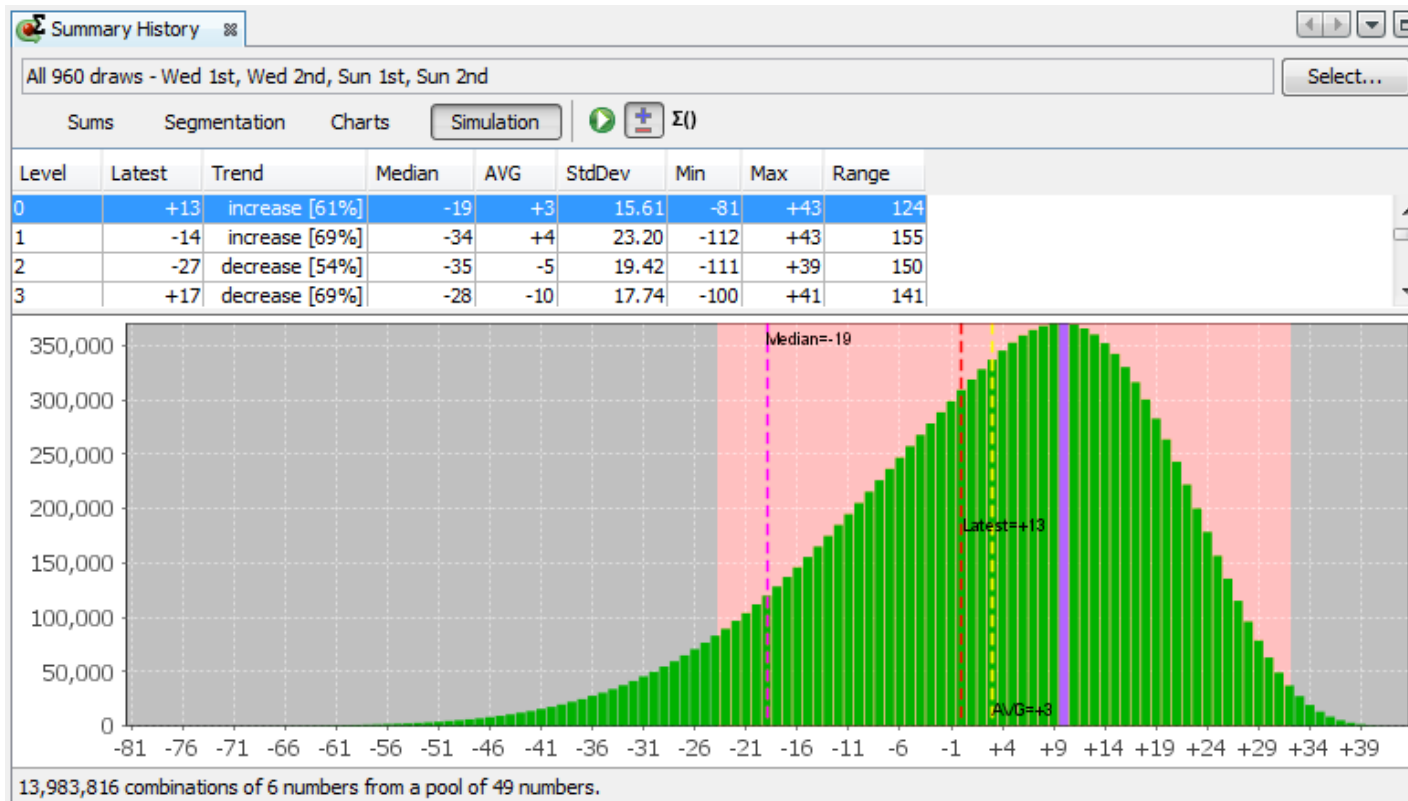
The most frequent value is +10 which was simulated 371,183 times. Let's assume that *occurrence tresholds* in History settings window are set to 15% and 10% respectively.

Fifteen percent of 371,183 is approximately 55,677. So the range estimate will include differences that were simulated at least 55,677 times, that is differences greater than -27.

Ten percent of 371,183 is approximately 37,118. So the range estimate will include differences that were simulated at most 37,118 times, that is differences lower than +33.

Pink background in the figure above highlights the section of simulation histogram that is automatically transferred to *My Estimates* window for *occurrence thresholds* set to 15% and 10% respectively.

You can refine the hints in *My Estimates* window by zooming a section of the histogram chart:

1. Estimate the lowest possible History value for the next draw and click it in the chart.

2. Hold down mouse button and move the mouse cursor to the right up to the highest possible History value.

3. The histogram will zoom the selected section of the chart and Simulation hint in *My Estimates* window will show the new range.

▶ Blue bar in the histogram chart denotes the most frequent sum or difference from the simulation results.

▶ Black dotted line in the histogram chart denotes the sum or difference corresponding to the current what-if numbers.

▶ The whole histogram is projected into *History Sum* and *History Differences* charts as a grey gradient bar. Darker color denotes values with higher occurrences, lighter colors denote History values occurring only very seldom in the simulation results.

The status bar at the bottom of the window shows the count of tickets that were used for draw simulation and ticket filter applied on those tickets (if any).

▶ See also History Level Synchronization.

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Filter Group

Filter group consists of ticket filters and/or other filter groups thus forming the hierarchy of a Complex Filter. Filter group settings define how many of its sub-filters must accept a ticket so that the whole filter group accepts a ticket.

Example

Let's assume that filter group consists of three filters called *filter A*, *filter B* and *filter C* (in this order).

- When filter group settings are *Minimum count of filters to pass: 3, Maximum count of filters to pass: 3* then:
  - If *filter A* accepts a ticket and *filter B* accepts the same ticket and also *filter C* accepts the same ticket then the whole filter group accepts that ticket. Group's sub-filters are bound with logical operator **AND**.
  - If any of group's filters rejects a ticket then also the whole filter group rejects that ticket. **Note:** if *filter A* rejects a ticket then *filters B* and *C* are not evaluated at all and the whole filter group rejects that ticket immediately to increase filtering speed.
- When filter group settings are *Minimum count of filters to pass: 1, Maximum count of filters to pass: 3* then:
  - If any of group's filters accepts a ticket then also the whole filter group accepts that ticket. Group's sub-filters are bound with logical operator **OR**. Note: if *filter A* accepts a ticket then *filters B* and *C* are not evaluated at all and the whole filter group accepts that ticket immediately to increase filtering speed.
  - If *filter A* rejects a ticket and *filter B* rejects the same ticket and also *filter C* rejects the same ticket then the whole filter group rejects that ticket.

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Abort Running Tasks

This window pops up when invoking an action, which requires exclusive access to the tickets in the [Package](#) and some long running tasks are reading the Package contents.

- **OK** button performs the action you have originally invoked and aborts all the tasks listed in this window. It is up to you to decide whether it's safe to abort other running tasks or whether it's better to wait a moment, e.g. until the filter that has been running since the morning is finished.
- **Cancel** button closes this window and the action you have invoked will not be performed. You can invoke the action again when the long running tasks have finished.

Note: The list of all currently running tasks is available at the lower right corner of the main application window.

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History Simulation

It is very difficult to make correct predictions of [History ranges](#) in all levels. However most of the time there is at least one level where you can be sure your predictions will be correct in the next draw. In such cases this tool will help you estimate ranges in other levels or validate your existing estimates in other levels.

First open [My Estimates](#) window and make estimates for one or more levels. It should be the levels you are most comfortable with - for example because of the shape of appropriate History chart or because the History value (does not) repeat from previous draw etc.

Then select those estimates in *My Estimates* window and click 👤 button in its toolbar to open *Draw Simulation* window.

Select the tickets to use as simulated draws by clicking *Select* button. It is recommended to use the full wheel of all possible combinations. Make sure you have the correct selection of past draws.

The window shows all selected levels and their History ranges. If you selected more than one History level you can use controls at the bottom of the window to relax the filtering condition as necessary.

Click *Run Simulation* button to start the draw simulation process. You can track the progress of the simulation at the bottom of the main window.

The simulator will filter out all simulation tickets that do not produce History values within the ranges of selected Levels and calculate History values from the accepted tickets. The results will then show the minimum and maximum History sum found thus defining the maximum possible interval. You should check that your estimates in other levels are within that interval.

The results are available in [My Estimates](#) window and in History charts where they show as a histogram at the end of the chart. The darker areas of the histogram represent History values that were found most frequently during the simulation, brighter areas of the histogram denote History values that appeared very seldom during the simulation process.

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Predictions

The goal of all lottery strategies is the prediction of winning numbers that will hit in the next draw. Lottery players in most cases search for the most frequent or the least frequent numbers, then examine the latest winning numbers and/or their statistical properties trying to guess what is the most likely to happen in the next draw.

Expert Lotto has built-in tool which automates the prediction process to some extent. The application will search through selected past draws and compare them with the latest winning numbers to predict the numbers and statistical properties that are expected in the coming draw. As all other Expert Lotto features, the predictions are based on solid math. With the same input data and the same settings the predictor will always provide the same, reproducible results. There is no magical black-box spitting out different numbers each time it is clicked. Expert Lotto predictor is based on *pattern matching* algorithm which is widely used in many other computer-assisted fields – facial recognition, statistical data analysis, signal processing etc.

Pattern Matching

The following table lists 15 latest draws in Expert Lotto 6/49 lottery in descending order:

Date	Position 1	Position 2	Position 3	Position 4	Position 5	Position 6	Bonus
2010/28 Sun 2nd	23	29	36	42	44	47	7
2010/28 Sun 1st	6	13	14	19	41	42	29
2010/28 Wed 2nd	2	13	16	17	25	40	27
2010/28 Wed 1st	16	18	22	23	28	29	24
2010/27 Sun 2nd	1	6	12	24	32	41	44
2010/27 Sun 1st	2	15	22	29	30	37	42
2010/27 Wed 2nd	20	23	25	30	33	35	7
2010/27 Wed 1st	8	11	19	26	48	49	18
2010/26 Sun 2nd	8	11	18	32	36	38	6
2010/26 Sun 1st	5	6	11	31	40	43	32
2010/26 Wed 2nd	4	18	26	33	35	47	11
2010/26 Wed 1st	5	12	25	31	44	46	33
2010/25 Sun 2nd	10	15	28	30	36	43	35
2010/25 Sun 1st	16	21	24	25	35	46	47

2010/25 Wed 2nd	9	**12**	23	34	39	49	24

The latest three numbers at the second ticket position are: 13, 13 and 29. Those three numbers form the *latest pattern*. The pattern size is 3 as it consists of three numbers.

Now we will search the past winning numbers at the second ticket position and look for a similar pattern. The table above shows that the best *matching past pattern* can be found in draws *2010/26 Sun 2nd* to *2010/27 Wed 2nd*. The past winning numbers are 11, 11 and 23. The following draw is *2010/27 Sun 1st* where the second winning number is 15. So the prediction for the coming draw *2010/29 Wed 1st* is number 15 at the second ticket position.

Let's verify our prediction in Expert Lotto:

1. Open Expert Lotto 6/49 Demo lottery.
2. Click menu *Winning Numbers – Predictions* to open *Predictions* wizard window.
3. Choose *15 latest winning numbers* in the first step, click button *Next*.
4. Select *Pattern Matching* prediction type, click button *Next*.
5. Choose prediction settings as on the picture below. Click button *Next*.

6. Make sure *Ticket Positions* under *Positional statistics* is selected, click button *Finish*.

[Winning Number Properties](#) window opens and its table will show the following value in *Position 2* column:

Date	Numbers	Position 1	Position 2	Position 3	Position 4	Position 5	Position 6
Prediction		2	15	22	33	35	43
2010/28 Sun 2nd	23,29,36,42...	23	29	36	42	44	47
2010/28 Sun 1st	6,13,14,19,...	6	13	14	19	41	42
2010/28 Wed 2nd	2,13,16,17,...	2	13	16	17	25	40
2010/28 Wed 1st	16.18.22.23...	16	18	22	23	28	29

The downward red triangle indicates that the predicted trend is *decrease* in the next draw and the number predicted for the second ticket position is 15. See below for more instructions how to interpret the prediction results.
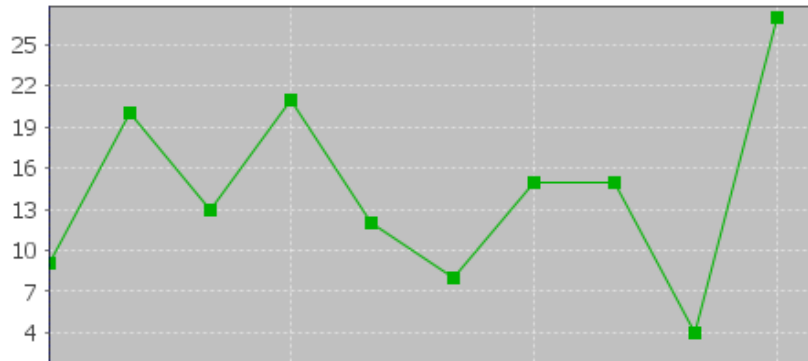
If we let the predictor scan the whole database of past winning numbers then it will find the best matching pattern in draws *2006/23 Sun 2nd* to *2006/24 Wed 2nd*. Their winning numbers are 12, 16 and 30. The following winning number at the second ticket position is 11. That means the predicted trend is again

decrease and the predicted value is 11.

What happens if we increase the pattern size from three numbers to 10 numbers? The latest pattern is then 6,11,11,23,15,6,18,13,13,29. When displayed in a chart the numbers look like this:

The predictor will find best matching pattern in draws *2008/45 Sun 2nd* to *2008/48 Wed 1st* where the winning numbers are 9,20,13,21,12,8,15,15,4,27. The numbers in a chart look like this:

The following number at the second ticket position is again 11 (draw *2008/48 Wed 2nd*). That means the predicted trend is again *decrease* and the predicted value is 11.

If you compare the chart of the latest pattern and the chart of the found matching pattern above, you can see that the match is actually very loose. But it is still the best match the predictor can find in the whole database of past winning numbers. We cannot realistically expect to find a sequence of past winning numbers that is exactly the same as the ten latest draws. The longer the patterns are the less similarities between the latest pattern and the best matching pattern. So how to select the optimal pattern size?

In the examples above we used pattern size 3 which gave us predicted value 11 and pattern size 10 also with predicted value 11. In this case we have the same results. But what if the predicted values or even the predicted trends were different? How to tell which prediction is more credible?

The predictor runs a series of tests and selects the best pattern size automatically. Option *Latest draws for back-testing* in prediction settings screen defines how deep this back-testing is. If the prediction settings are for example *Pattern size min 3, max 15, Latest draws for back-testing: 10* then the predictor will make 130 predictions to pick the optimal pattern size. It will start with pattern size 3, make prediction for draw *2010/28 Sun 1st* and compare the predicted trend with actual value from the following draw *2010/28 Sun 2nd*. Then it will make prediction for draw *2010/28 Wed 2nd* and compare the predicted trend with the value from the

following draw *2010/28 Sun 1st*. There will be 10 such testing predictions up to draw *2010/26 Wed 2nd*. The predictor will count how many predicted trends were correct when compared with the following draws.

Then the pattern size will increase to four and the predictor will make another ten testing predictions for ten latest draws. The count of correct trend predictions is noted. The pattern size is increased to five and the testing runs are repeated. This continues up to pattern size 15 as selected in prediction settings. Then the predictor will select the pattern size that had the highest count of correct trend predictions. This optimal pattern size is then used to make the actual prediction for the latest draw *2010/28 Sun 2nd*. In this case the best pattern size is 3 because seven trend predictions were correct during back-testing. When using pattern size 10, there were only 4 valid trend predictions out of the ten back-test runs.

▶ Hover mouse cursor above table cell with prediction result to see a tooltip with the best pattern size and the count of back-test predictions that were correct.

With option *Back-testing compares values* you can modify the prediction algorithm to select the pattern size that predicts values which are closest to the actual values when back-testing.

▶ Some lottery operators publish additional details about each draw – which set of balls has been used, which drawing machine etc. If the balls and/or machines are being changed at regular intervals it probably makes sense to use pattern sizes shorter than the interval between such changes.

Match Differences

The predictor has two modes of pattern matching. It can match either absolute values in a sequence of numbers as demonstrated above or it can match number differences instead. Let's have the following sequence of numbers:

31,35,13,20,15,5,2,10,4,25,3,10,5

Let's consider the last three numbers as the latest pattern: 3,10,5. When matching absolute values then the best matching pattern is 2,10,4 followed by number 45. However when matching number differences then the best matching pattern is 13,20,15 followed by number 5.

The same sequence of numbers expressed as value differences looks like this:

+31,+4,-22,+7,-5,-10,-3,+8,-6,+21,-22,+7,-5

So the latest pattern has changed to -22,+7,-5 and the best matching pattern is -22,+7,-5 corresponding to numbers 13,20,15 followed by number 5. So when matching differences the matching pattern must have the same shape (the order of increasing/decreasing values) as the latest pattern however all its values may be shifted up or down when compared with the latest pattern.

Now we will repeat the prediction for the second ticket number and use differences pattern matching instead of absolute values:

The best matching pattern are draws *2006/20 Wed 1st* to *2006/20 Sun 1st* with numbers 4,4,21, which translate to differences -3,0,+17. The following difference is -8.

The differences of the latest pattern are -5,0,+16. The predicted value is

29 – abs(-8 * (abs(-5/-3) + abs(0/0) + abs(16/17)) / 3 *) = 29 – 9.62 = 19.

Note that the predicted value includes correction which takes into account the differences between the latest and best matching patterns.

The same prediction with pattern size 10 will find the best matching pattern at draws *2009/24 Wed 1st* to *2009/26 Wed 2nd* where the numbers are 5,15,15,20,13,10,14,9,6,11 and the following number is 21. The prediction is *increase* to 46. This prediction is conflicting with the prediction with pattern size 3. However this prediction is a bit less credible as the back-testing passed in 5 out of 10 back test runs, while pattern size 3 predictions had 6 valid trend predictions during back-testing.

▶ It is recommended to use *differences pattern matching* especially for predictions of derived values like History sums and differences. Absolute values pattern matching is suitable for values with a small range, for example sum root, odd/even or the actual winning numbers at individual ticket positions.

Relaxed Pattern Matching

Pattern matching slider in *Predictions Options* window adjusts the weights of individual numbers when the patterns are being compared. When the slider is moved fully to the right then the pattern matching is strict and each number has the same weight.

Moving slider to the left relaxes the pattern matching as the numbers of the patterns being matched have lower weight when comparing them together. If the latest pattern is for example 6,11,11,23,15,6,18,13,13,29 then strict pattern matching may find for example pattern 9,20,13,21,12,8,15,15,4,27. With relaxed matching the best found pattern will be for example 33,16,25,14,31,11,18,12,16,30. As you can see the first few numbers of the best matching pattern match the latest pattern very loosely only. In both cases the predicted value is 10 however with relaxed pattern matching there were 9 valid back-test predictions while the strict matching produced only 7 valid predictions when back-testing on 15 latest draws. Relaxed pattern matching is recommend only when using larger pattern sizes (10 and more).

Using the Predictor

Predictions are available either from menu *Winning Numbers – Predictions* or from menu *History – Predictions*. Both menu commands start *Predictions* wizard.

1. In the first step select the past winning numbers draws to be scanned for matching patterns.

2. The second step in the wizard window selects the prediction method. Only the *Pattern Matching* algorithm is currently available.

3. The next step are options to customize the prediction algorithm. See above for more details.

4. The last step lists statistical or History values that can be predicted. Tick the items you are interested in and click button *Finish* to start the predictions.

You can track the progress of the prediction process at the lower right corner of the main window. When the process is finished the prediction results are available in Winning Numbers Properties and Winning Numbers Charts windows or in Summary History window under *Sums* and *Charts* tabs.

Interpreting the Results

– blue triangle indicates that the predicted trend is *increase*. That means the next value is expected to be greater than the latest value. The actual predicted value is also available.

– red triangle indicates that the predicted trend is *decrease*. That means the next value is expected to be lower than the latest value.

 – when both red and blue triangles are present in table cell then the predicted trend is *level*. That means the next value is expected to be the same as the latest value.

Note: The predictions algorithm operates just with a sequence of numbers. In some cases the predicted value can be lower or higher than the minimum or maximum possible values. In such cases you should consider the predicted trend only.

Value *n/a* in prediction results means it was not possible to make valid prediction. Usually because there are not enough data to select the matching pattern.

▶ The predicted trend should be the main indicator when estimating values for the coming draw. The actual predicted value should be only a hint showing how big the predicted increase or decrease is.

Hover mouse cursor over predicted cell to see a tooltip with additional information regarding the prediction. You can see how many back-test predictions were correct and the pattern size that has been used for predictions.

▶ It is recommended to ignore predictions with low percentage of successful back-test by entering required percentage of successful back-test into the last input field.

Additional Information

Detailed information about the prediction process is available in *Application Log*. When the predictions are finished click menu *View – Application Log*. The *Output* window then shows the following details for each predicted value. For example:

Position 2 – name of the predicted value. In this case it is the winning number at the second ticket position.

Trend prediction: Decrease – predicted trend (increase/decrease/level)

Predicted value: 10.0 – the actual predicted value. Please note that all values are zero-based so the predicted winning number is 11.

Best pattern size: 5 – the pattern size used for the prediction.

Best weight: 1.0 – the weight used for pattern matching. The weight is always 1.0 unless relaxed pattern matching has been used.

Matching pattern: [10.0 17.0 11.0 15.0 29.0] => 10.0 – the best matching pattern found. In the case the best pattern are numbers 11,18,12,16,30. The number following this pattern is 11.

Marker: 94 – the position in the sequence of numbers where the best matching pattern has been found. Value 0 means the oldest draw.

Back-tests: 15 – the count of back tests that have been carried out to validate the pattern size.

Mean Square Error: 107.66666666666667 – shows how much the back-test prediction values differ from the actual values. The lower MSE the more accurate the back-test prediction values are.

Mean Absolute Percentage Error: 0.6399601052542229 - MAPE indicator also compares the back-test predictions with the actual values.

Valid trend predictions: 6 (40.0%) - how any back tests produced correct trend prediction.

See also Trend Predictions filter.

Filtering Tickets

There is one sure way to win the lottery Jackpot - play all possible combinations. However the payouts are never so big to return the cost of such a huge bet, not to mention the time needed to fill out so many playslips. Most lottery players have limited betting budget so they play a small wheel only. Depending on your lottery strategy you can download a wheel from internet or create a new one from scratch by filtering down the whole set of all possible combinations. The filtering process excludes combinations - *tickets* - that are not expected to win in the next draw. It is either a manual process of going through the tickets one by one and removing those you don't like or it can be done in bulk by applying *ticket filters*.

Ticket filter is a simple *yes/no* condition. A filter *accepts* a ticket when the ticket numbers meet filter's condition, filter *rejects* a ticket if the ticket doesn't meet filter's condition. The filter condition can be either a simple check for desired ratio of odd and even numbers or the filter can compare ticket numbers with past draws or it can be a complex hierarchy of other simple filters.

Package Filtering

To filter tickets in the Package, click menu *Package - Reduce - Filter Tickets*. Then select the filter you wish to apply to Package tickets and click *Select* button to open the selected filter. A new window opens where you can enter the settings of selected filter. At the bottom of the filter window there are buttons to run the filter:

- **Matching Tickets** - with option *Accept* the filtered Package will contain tickets that meet filter settings. Option *Reject* reverses the filter condition so the filtered Package will contain only tickets that don't pass the filter settings.
- **OK** - applies the filter to the Package tickets and closes the filter window. You can track the filter progress at the bottom of the main application window. To abort the filter, click the *Abort* button next to the filter's progress bar.
- **Apply** - applies the filter to the Package tickets and keeps the filter window opened. When the filter is finished you can adjust filter settings and apply the filter again. To abort the filter, click the *Abort* button next to the filter's progress bar.
- **Preview** - counts how many Package tickets the filter accepts and how many tickets the filter rejects without any actual changes to the Package contents.
- **Cancel** - closes the filter window.

To revert the filtering results, click menu *Edit - Undo* to return the Package to the same state as before filtering.

▶ When *OK* or *Apply* button is clicked in the filter window then the current filter settings are remembered and reused as the default settings when the filter is opened again.

▶ If you play a lottery that draws one or more bonus numbers from the same pool as the main numbers it is possible to modify the selection of past draws in filter window to merge the bonus number(s) into the main numbers. This option is available only when filtering Package tickets using a single filter. It isn't possible to merge bonus numbers with main numbers in *Complex Filter* window.

Complex Filters

Implementing an advanced lottery strategy usually requires a lot of ticket filtering. Complex Filters allow grouping of frequently used simple filters together and applying them in a single step. *Complex Filters* can be stored to a file and reopened on next application startup. Another advantage of *Complex Filters* is that they support building of a deep hierarchy of simple filters with *AND/OR* logical operators. *Complex Filters* can be also back-tested and their performance is easily evaluated.

Proxy Settings

If you are connecting to internet through a proxy server you can use this options panel to enter proxy server address and port. However in most cases you can leave option *Use System Proxy Settings* on and the application will try to detect and reuse proxy settings from your operating system.

Important: Entering invalid proxy settings may disable some application features that rely on internet connection - checking for application updates, online update of winning numbers or creation of pre-defined lotteries.

Note: This options panel opens from menu *Tools - Options - General.*

Triplets

These statistics show the occurrences of all possible number triplets in analyzed tickets. In a x/49 the triplets are *1-2-3, 1-2-4, 1-2-5* and so on up to *46-48-49* and *47-48-49*.

See also **Consecutive Triplets** statistics.

Summary Winnings

Summary Winnings window opens after clicking button *Summary* in **Package Winnings** window. It shows the summary count of tickets winning any prize.

Column *Payout* shows the money payouts for given prize category. Double-click any field in that column to adjust the payouts. Column *Total* shows the break down of winnings per prize category.

Fields below the table show the total winnings, the total cost of the bet and net profit. The cost of single bet is adjustable using menu *Tools - Options - Miscellaneous - [Payouts](#)*.

<div align="right">[back to top]</div>

Resize Lottery

Menu *Tools - Lottery - Resize* starts *Resize Lottery* wizard wizard where you can adjust the count of main ticket numbers and/or merge bonus number(s) into main numbers.

When the wizard is finished a new lottery will be created. The new lottery will have the same set of past winning numbers as the current lottery.

There are several steps when resizing a lottery:

1. Introduction

A brief description of the wizard window.

2. Resize

Tick main ticket positions you wish to use in the new lottery.
If the current lottery draws any bonus or powerball numbers there are tick boxes to include the bonus numbers in the new lottery. If the bonus number comes from the same pool as the main numbers you can merge that bonus into main numbers.

You can also select how many main numbers Package tickets will have in the new modified lottery.

A table at the bottom of the wizard window shows how past winning numbers draws will look like in the new modified lottery.

3. Winning Combinations

Choose which combinations of matching numbers are the winning ones by ticking the *Is Winning?* column. Highlight any matching combination in the table and use *Move Up* and *Move Down* buttons to move it up or down in the list.
You can also change the default prize names in the *Prize* column by double-clicking the appropriate table cell and typing a new name.

4. Rename

Enter the name of the modified lottery, short description and lottery web site address. This info will show in application's About box (menu Help - About - Lottery).

5. Destination

Click button *Browse* to select the folder the modified lottery will be stored in. The selected folder must be empty.

Click button *Finish* to finish the *Resize Lottery* wizard. The wizard will create a new lottery using the settings you've just modified and the same winning numbers database as the current lottery. The current lottery with old settings still remains on your hard disk.

Read more on lottery management [here](#).

Pairs

These statistics show the occurrences of all possible number pairs in analyzed tickets. In a x/49 lottery the pairs are *1-2, 1-3, 1-4* and so on up to *47-48* and *48-49*.

For example in Expert Lotto 6/49 Demo Lottery the 10 latest draws are:

2010/28 Sun 2nd	23	29	36	42	44	47	[07]
2010/28 Sun 1st	06	13	14	19	41	42	[29]
2010/28 Wed 2nd	02	13	16	17	25	40	[27]
2010/28 Wed 1st	16	18	22	23	28	29	[24]
2010/27 Sun 2nd	01	06	12	24	32	41	[44]
2010/27 Sun 1st	02	15	22	29	30	37	[42]
2010/27 Wed 2nd	20	23	25	30	33	35	[07]
2010/27 Wed 1st	08	11	19	26	48	49	[18]
2010/26 Sun 2nd	08	11	18	32	36	38	[06]
2010/26 Sun 1st	05	06	11	31	40	43	[32]

Pairs analysis shows that the draws don't contain pair *1-2*. Also pairs *1-3, 1-4* and *1-5* are not found in analyzed tickets. Pair *1-6* occurs just once (see cells with blue background in the table above).

For example pair *22-29* has been found twice in the analyzed tickets (see cells with orange background) so the analyzer table shows *Occurrence* value of 2 in the corresponding table row.

See also Consecutive Pairs statistics.

Lookup Min/Max Ranges

This window opens from My Estimates window after clicking 🦶 button in its toolbar. Use this feature to find the minimum and maximum possible *History Sum* values for the next draw:

1. Select past draws to calculate the latest History values from. When looking for the min/max possible values for the next draw you should select either the whole winning numbers database or several latest draws.
2. Select tickets to use as simulated winning numbers draws. To find the absolute min/max possible values you must select a full wheel of all possible combinations. When playing a lottery with a huge count of possible combinations, for example most Keno lotteries, you can use *Interval* option in Full Wheel window. It will decrease the calculation time while maintaining a good statistical distribution of generated tickets.
3. Click button *Start*.
4. When the calculation is finished the table will show minimum and maximum *History Sum* values found when simulating draws with all selected tickets.
5. Click button *OK* to close this window and use the calculated values in Absolute Ranges hint in *My Estimates* window.

Option *Use as my estimates* automatically enters the min/max values as current estimates into all unlocked Levels in *My Estimates* window.

▶ You should always calculate the absolute min/max ranges as the first step of your lottery strategy when using History functions. For example if the absolute minimum in Level 0 is 295 and the absolute maximum in the same Level is 419 then there is no point estimating the range for Level 0 to e.g. 420 to 440. There is no combination of pool numbers that would produce a *History Sum* within that range. Also estimating for example range of 405 to 425 is wrong. There are no tickets to produce sum in the range of 420 to 425 so you are wasting a portion of your safety margin.

Matrix Filtering

Remove Matching Tickets window opens after clicking *Filter* button at the bottom of Package Matrix window or Winning Numbers Matrix window.

Note: *Filter* button in *Package Matrix* window is enabled only when there are some tickets in the Package and one or more numbers are highlighted in matrix table header. *Filter* button in *Winning Numbers Matrix* window is enabled only when the table is showing one or more draws and some numbers are highlighted in matrix table header.

You can use this window to remove tickets/draws that contain selected count of highlighted numbers - tick appropriate check boxes in the filter window then press *Remove Match In* button.

Note: Using this filter in *Winning Numbers Matrix* window does **NOT** remove any entries from winning numbers database. The filtered draws are just removed from the table only. You can make a new selection of past draws by clicking *Select* button to list the removed draws in the table again.
On the other hand filtering in *Package Matrix* window does remove filtered tickets permanently from the Package. You can use menu command *Edit - Undo* to revert the filtering.

Open File

Menu command *File - Open File* brings up a standard window for file selection where you can choose a file to open in Expert Lotto:

- **Complex Filter files** have *.filter* extension and open in [Complex Filter](#)window. If the selected complex filter is already opened then filter's window is just activated instead of opening a new window.
- **Custom Analyzer files** have *.analyzer* extension and open in [Custom Analyzer](#)window. If the selected custom analyzer is already opened then analyzers window is just activated instead of opening a new window.
- **Ticket files** have extension *.tXYY* where *X* is the count of ticket numbers and *YY* is the count of all numbers in the pool. Selecting a ticket file in *Open File* window opens [Insert Ticket File](#) window with the selected file.
- **Plain text files** usually have extension *.txt* or *.csv* and open in a simple editor window. You can edit the content of opened files and save them back to disk using menu command *File - Save*. A tooltip in editor's header shows the file location.

Note: You can also drag and drop a file into the main application window to open it in the same way as using menu command *File - Open File*.

Simulation Draws

This window is the first step when performing History [draw simulation](#). The tickets selected in this window will be treated as winning numbers and their History values will be calculated and summarized in *Draw Simulation* table.

Click button *Select* in the upper part of the window to open popup menu to select the tickets for draw simulation. The content of the lower part of the window differs depending which window the simulation is started from.

Click button *Run Simulation* at the bottom of the window to start Draw Simulation.

Segmentation Simulation

Click menu *History - Latest* to open [Latest History](#) window, switch to *Segmentation* mode and toggle *Draw Simulation* button. Then click ⏵ button to open *Simulation Draws* window.

The lower part of the window contains controls to adjust segmentation filter settings. The filter will be applied to simulation tickets and the simulation results will be calculated only from tickets the filter accepts.

The example above invokes draw simulation for all possible number combinations in Expert Lotto 6/49 demo lottery. History values will be calculated only for tickets that have two to four numbers from *Segment 1* in Level 0 **AND** one to three numbers from *Segment 2* in Level 0 **AND** one to three numbers from *Segment 3* in Level 0. All other tickets are discarded and don't affect simulation results.

Button 🝘 at the bottom left corner of the window applies the segmentation filter on tickets in the Package. The button is enabled only when the Package isn't empty.

Summary Simulation

Click menu *History - Summary* to open Summary History window, switch to *Simulation* mode and click ▶ button to open *Simulation Draws* window.

There is *Use filter* check box at the lower part of the window. Tick the check box and click *Select* button to choose a filter to be applied to simulation tickets. Only tickets accepted by the filter will be used to calculate History values. Using a filter during *Draw Simulation* enables comparing simulation results of pre-filtered tickets with the simulation results of e.g. all possible number combinations.

Using a filter in Simulation Draws window is just a shortcut for the following steps:

1. Insert the simulation tickets into the Package.
2. Filter Package tickets with selected ticket filter.

3. Run Draw Simulation for Package tickets.

Matrix Match Summary

This window opens after clicking *Match Summary* button at the bottom of [Package Matrix](#) window or [Winning Numbers Matrix](#) window. The table shows summary count of tickets that contain highlighted numbers. Column *Match* contains the count of highlighted numbers in a ticket, column *Count* shows the summary count of tickets in the Package or draws in the matrix table with the given count of highlighted numbers.

Note: *Match Summary* button in *Package Matrix* window is enabled only when there are some tickets in the Package and one or more numbers are highlighted in matrix table header. *Match Summary* button in *Winning Numbers Matrix* window is enabled only when the table is showing one or more draws and some numbers are highlighted in matrix table header.

New Lottery

Menu *File - New - Lottery* starts *New Lottery Wizard* where you can pick one of the ready-to-play lotteries or create a custom lottery. There are several steps when creating a new lottery:

1. Select Lottery

Choose any lottery from the list of lotteries that are available at Expert Lotto web server. Click table header to sort the list either by the country of origin or by the lottery name. When hovering mouse cursor over any table row a short lottery description pops up. Clicking button *Next* downloads the lottery and the wizard continues with *[Step 9](#)*.
Note: Internet connection is required when *Available lotteries* option is selected.

If you find out that the selected lottery is out-date, for example because the lottery rules have changed or because there are mistakes in lottery winning numbers database, please click *Report obsolete lottery* button to the right of the *Available lotteries* table. It will open an email window addressed to Expert Lotto support team where you can describe what is wrong with selected lottery. After receiving this email Expert Lotto team will attempt to address the problem in one of the next application updates.

If the lottery you want to play isn't listed in the *Available lotteries* table, click *Create other lottery* option and then choose button *Next* to continue with wizard's next step.

2. Name

Enter lottery name, short description and lottery web site address. This info will show in application's About box (menu *Help - About - Lottery*).

3. Type

When creating a Jackpot or Keno lottery select option *All numbers from the same pool*.
When setting up a Powerball lottery which draws main numbers from the same pool and one or more powerball numbers from separate pool(s) select option *One or more additional numbers from a different pool*.
To create a Pick 3 or Pick 4 lottery which draws each number from a separate pool select the last option.

4. Number Pools

Note: The content of this wizard step differs according to lottery type selected in *Step 3*.

Jackpot/Keno

Enter the count of main numbers into the first field. If you're setting up a Jackpot lottery which draws bonus numbers enter their count into the next field, enter zero into that field when creating a Keno lottery.
Next choose the lowest and highest number in the pool.
Jackpot lotteries draw the same count of main numbers as the count of numbers marked on a playslip, Keno lotteries draw more numbers than how many are marked on a playslip.
You can also choose whether the winning numbers in each draw are sorted in ascending order or whether you want to keep them in the original draw order.

Powerball

The first part of this wizard step is the same as for Jackpot lotteries but you must also define the pool(s) for Powerball number(s).
If the lottery draws e.g. two powerball numbers from a pool of 35 then enter "2" into bonus numbers field and select that *Bonus 1* ranges from 1 to 35. Then click the combo box, pick *Bonus 2* from the popup list and also enter 1 to 35 into the pool range fields. You can pick any name for the Powerball pool - *Mega Ball*, *Extra Ball*, *Power Ball* - to match your lottery rules.
If the lottery draws e.g. two additional numbers from the same pool as the main numbers and 1 powerball from a separate pool of 5 numbers then enter "3" into bonus numbers fields.
Select the same pool range as the main number pool range for *Bonus 1* and *Bonus 2*. Then pick *Bonus 3* and enter "1" and "5" into pool range fields.

Pick 3/4

Select how many numbers are drawn and the size of each number pool.
Note: There are special matching rules for Pick 3 lotteries (e.g. *3-way box*, *front pair* etc) and for Pick 4 lotteries (e.g. *12-way box*). Lotteries that draw more than four numbers have only simplified ticket matching rules.

5. Draw Dates

Choose how the date of each draw will look like:

- **Day, Month, Year** - each draw date consists of day of the month, month and year, the exact order and format depends on regional settings of your operating system. There can be multiple sets of winning numbers for each draw date.
- **Week Number, Year** - each draw has week number (ranging 1 to 53) and calendar year. There can be multiple sets of winning numbers for each draw date.

- **Draw Number, Day, Month, Year** - each draw has a unique number which fully identifies the draw. The calendar part of the draw date is only supplementary. The winning numbers database cannot contain two draws with the same *Draw Number*. This type of draw date is intended for lotteries that draw winning numbers for example every hour or every 5 minutes.

6. Schedule

1. Select which day a new week starts on by clicking appropriate button. This option is required to correctly order the draws in various tables and lists.
2. Choose which days of week the numbers are drawn on.
3. Some lotteries draw multiple sets of winning numbers on the same day. For example there are mid-day and evening draws in some Pick 3 lotteries. Use the combo box to define the count of number sets and enter number set names into the appropriate fields.
4. The lottery start date is for convenience only as it is used to find draws that are missing in your winning numbers database.

Make sure that these settings actually match the draw schedule of your lottery. Otherwise you might have problems when importing past winning numbers or when updating your winning numbers database online.

7. Winning Combinations

Choose which combinations of matching numbers are the winning ones by ticking the *Is Winning?* column. Highlight any matching combination in the table and use *Move Up* and *Move Down* buttons to move it up or down in the list.
You can also change the default prize names in the *Prize* column by double-clicking the appropriate table cell and typing a new name.

8. Ticket Panel

Define the layout of numbers in a ticket panel to match the paper playslip. If you are creating a powerball lottery you must define panel layout for additional pool(s) as well.
Although these settings are not mandatory and you can keep wizard's default values there is a filter and statistics that are based on ticket panel layout.

9. Destination

Click button *Browse* to select the folder the lottery will be stored in. The selected folder must be empty.

Click button *Finish* to finish the *New Lottery Wizard* and start playing the new lottery.

Read more on lottery management here.

See also Edit Lottery Settings wizard and Resize Lottery wizard.

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Panel Layouts

This window opens after clicking *Edit* button in Ticket Panel window.

Note: Custom ticket panel layouts are available only in lotteries that draw all main numbers from the same pool.

The window lists custom ticket panel layouts that are available for the current lottery. Initially the window is showing the *Default* layout only. It is the layout that should match the layout of tick boxes on paper playslips.

- **Add New** - use this button to create a [new ticket panel layout](#).
- **Modify** - clicking this button opens [Edit Panel Layout](#) window where you can modify an existing ticket panel layout. It isn't possible to modify the *Default* layout.
- **Duplicate** - this button creates a copy of selected ticket panel layout. Then you can use *Modify* button to customize the new layout copy.
- **Remove** - use this button to permanently delete selected ticket panel layout(s). It isn't possible to remove the *Default* layout.

When you are finished making changes to your ticket panel layouts click button *Close* to return to the *Ticket Panel* window. Then use its *Layout* combo box to display any of the new or modified panel layouts.

Chart Window

Chart window appears at several place in Expert Lotto. For example, it displays summary statistics as a bar chart, sequence of statistical properties for past draws in a line chart or the progress of History sums and differences.

Use toolbar buttons at the top of the chart window to customize the chart appearance:

- **Zoom** - by default each chart shows the whole horizontal axis. You can zoom any part of the axis by clicking into the chart and dragging the mouse cursor to the right. To reset the zoom either click this button or click the chart window and drag the mouse to the left.
- **Zoom Out** - increases the range of the Y value axis. Use this function when some of the chart points to not fit into chart window.
- **Range Tool** - toggles adjustable chart ranges. There are two sliders to the right of chart window highlighting a portion of the vertical axis when toggled on. Use your mouse to move the sliders, hold down CTRL key to move both sliders at the same time. Alternatively you can enter chart ranges directly from keyboard into the spinner fields at the top and at the bottom of the sliders.
  The range tool helps when evaluating how many chart points fall into highlighted area. In some case the highlighted range is transfered to other parts of the application. For example ranges from History summary and History differences charts are available in [My Estimates](#) window.
  Click the little down arrow next to Range Tool icon to open context menu with additional options:
  - *Save* - stores the current position of chart ranges so they can be restored later on.
  - *Recall* - restores chart ranges into previously saved positions. A tooltip shows when the ranges where stored. Use this feature to compare your chart estimates with actual values when the next winning numbers are drawn.
- **Chart Options** - opens a drop-down menu with the following options:
  - **Average Value** - displays a horizontal line in the chart which denotes the average value.
  - **Median Value** - displays a horizontal line in the chart denoting the median value.

- □ 🏴 **Linear Fit** - toggles linear fit line in the chart. When this line points up then it means the chart points have upwards trend, if the line points down then chart points have decreasing trend.
- □ 〰️ **Moving Average 1 to 3** - shows moving average lines which consists of a series of average values calculated from several preceding chart points. The count of points the moving is calculated from is adjustable in [Statistics](#) and [History](#) preferences.
- □ 🎯 **Single Y Scale** - when a chart window shows more than one data set this button can be used to harmonize all chart points to a single Y axis value range. This feature is neccessary for example when comparing *Number movement* data at various ticket positions.
- □ **Data Points** - with this option on the line charts will show little shapes at points corresponding to appropriate draws. Turn this option off to get cleaner look of chart windows, especially when displaying a lot of past draws.
- □ 📊 **More Y Axis** - when a chart window shows more than one data set this button can be used to toggle the display of additional vertical axis.
- □ **Colors** - opens [Options](#) window to customize color settings.

Some other chart settings are adjustable in [Options](#) window.

▶ You can export any chart window to a *JPEG* or *PNG* file - click into the chart window first, then select menu *File - Export*. You will be prompted for file name the chart picture will be exported to. By default the exported images open automatically in the default application associated with image file types.

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Export Draw Intervals

This wizard window opens after clicking 🎲 button in statistical [analyzer](#) toolbar.

The application user interface lets you display [draw interval details](#) for a single analyzer table row only. If you want to see draw intervals for all table rows you must export the data in CSV or MS Excel file first.

You can export the data either as a summary report that shows draw intervals only or you can create a per-draw report which includes draw dates and list draw intervals for each draw.

Example [Expert Lotto 6/49 Demo Lottery]

1. Click menu *Winning Numbers - Analyze* to calculate [Ticket Numbers](#) statistics for the latest 50 draws.
2. Click 🎲 button to open *Export Draw Intervals Report* wizard.
3. Choose *Report type: summary* and *Export to: CSV Text File*.
4. Click button *Next* and select the file to write the report to.

The summary report will look like the table below:

Ticket Numbers															
1	1	6	9	1	4	11	5								

2	2	12	2	8	17	3	3						
3	1	3	2	6	1	1	1	2	2	22			
4	2	17	6	1	13	11							
5	3	18	7	8	2	10							
6	20	11	6	5	3	2							
7	7	3	25										
8	6	16	8	8	1	8							
9	12	9	14	15									
10	5	19	13										
11	10	10	11	8	1	1	8						
12	10	4	2	7	2	2	2	3	7	5			
13	22	2	2	19	1	2							
14	11	20	2										
15	7	6											
16	7	29	10	1	3								
17	8	3	2	28	3								
18	23	16	2	5	4								
19	5	8	3	1	4	10	6	2					
20	4	12	1	2	4	16	7						
21													
22	6	4	12	11	10	2	4						
23	1	6	3	8	1	4	2	1	5	2	8	3	3	1
24	3	2	13	5	2	9	5						
25	4	3	3	7	1	5	5	2	5	4	3		
26	6	2	29	3	8								
27	6	4	2	6	1	19							
28	16	7	5	9	4								
29	3	17	6	12	2	3	1						
30	1	5	1	3	3	1	2	15	6	1	6		
31	5	5	7	7	9	5	2	10					
32	13	8	5	5	9	4	5						
33	25	1	1	8	4	7							

34	15	3	6	8	1	15		
35	2	4	1	5	18	5	3	4	7
36	3	4	4	18	4	8	1	
37	11	3	15	11	6			
38	2	5	12	12	9			
39	1	2	23	2	3	15		
40	4	6	5	15	6	7	3	
41	3	18	14	3	2			
42	18	19	1	1				
43	16	3	10					
44	3	6	8	14	11	1		
45	11	1	34					
46	1	5	3	27	2	12		
47	1	12	21	10	1			
48	2	11	13	1	2	12	8	
49	13	15	2	7	8			

The first column lists the pool numbers, the following columns show the draw intervals of given pool number in the latest 50 draws.

Example [Expert Lotto 6/49 Demo Lottery]

1. Click menu *Winning Numbers - Analyze* to calculate Odd/Even statistics for the latest 10 draws.
2. Click ⚡ button to open *Export Draw Intervals Report* wizard.
3. Choose *Report type: per-draw* and *Export to: CSV Text File*.
4. Click button *Next* and select the file to write the report to.

The detailed per-draw report will look like the table below:

	0:6	1:5	2:4	3:3	4:2	5:1	6:0
2010/26 Sun 1st	1	1	1	1	1	1	1
2010/26 Sun 2nd	2	1	2	2	2	2	2
2010/27 Wed 1st	3	2	3	1	3	3	3
2010/27 Wed 2nd	4	3	4	2	1	4	4
2010/27 Sun 1st	5	4	5	1	2	5	5
2010/27 Sun 2nd	6	5	1	2	3	6	6
2010/28 Wed 1st	7	6	1	3	4	7	7

2010/28 Wed 2nd	8	7	2	1	5	8	8
2010/28 Sun 1st	9	8	3	1	6	9	9
2010/28 Sun 2nd	10	9	4	1	7	10	10

The table header lists all possible combinations of odd and even numbers. The first table column are the dates of the latest ten draws. Cell values show the draw interval of the given odd/even combinations and the given draw.

From the table above you can see for example that the odd/even ratio 3:3 hit in the very latest draw (its draw interval is *1*). Ratios 0:6, 5:1 and 6:0 never hit in the latest ten draws.

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Filter List

Filters window opens from menu *Tools - Filters* and lists all filters available for current lottery. You can drag and drop filters from this window into Complex Filter designer or you can double-click any filter to filter tickets in the Package. Package filtering is enabled only when the Package isn't empty.

You can reorganize the filters tree by dragging and dropping filters into different categories. To create a new filter category, right-click in the *Filters* window and select *New Category* from the popup menu. To remove a filter or category from the list, right-click the filter/category and select *Delete* from the popup menu. Select *Reset Filters* in the popup menu to restore all deleted filters.

You can add saved *Complex Filters* to the *Filters* window by invoking *Add Filter Reference* from window's popup menu. This way you can conveniently access your frequently used *Complex Filters*.

Note: Filter labeled *From file* provides access to *Complex Filters* on your disk. When dropped to a *Complex Filter* window or when double-clicked for Package filtering it first opens a file browser window to select *Complex Filter* file(s) to use.

▶ A little star in filter icon denotes filters that you haven't used yet or filters that were added in the latest application update.

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Select Draws

This window opens up to select past draws from your winning numbers database. For example after clicking *Select* button in Winning Numbers Table window.

- **All** - selects all draws from the database

- **Latest** - selects given number of the most recent draws.
- **Latest Range** - selects a range of the most recent draws. For example selection *Latest Range 3 to 6* will select four draws: the most recent draw won't be selected, the second most recent draw also won't appear in the selection but the 3rd latest draw, 4th latest draw, 5th latest draw and 6th latest draw will show in the selected range.
- **All Except** - selects all draws from the database except for the given count of the most recent draws.
- **Oldest** - selects the desired count of the oldest draws, i.e. a section from the beginning of the lottery history.
- **Range** - selects draws between given calendar dates.
- **Filter** - uses a regular ticket filter to select past draws. Click the button with three dots to open Select Filter window to pick a filter. The selected filter will be applied on all past draws. Only draws that match filter condition will be included in the draw selection. This way you can pick for example all past draws that have the ratio of odd numbers to even numbers 3:3.

Option *Jackpot Winners Only* further restricts the draw selection to include only draws in which some lottery player hit the Jackpot (1st prize). This option is available only when you mark one or more draws as Jackpot winners either when adding past draws or when managing your winning numbers database. Jackpot winning draws show a dollar ($) sign in their draw date when displayed in various application tables and lists.

Additionally you can use check boxes at the bottom of the window to further restrict the draw selection. For example select Saturday draws only or choose evening draws only. The check boxes depend on the draw schedule of the current lottery.

A message at the bottom of this window indicates how many draws will be selected with the current settings.

If you play a lottery that draws one or more bonus numbers from the same pool as the main numbers this window may offer another option to include the bonus number(s) into the main numbers.

For example when playing *Expert Lotto 6/49* demo lottery you can click *Select* button in Winning Numbers Properties window and tick option *Merge bonus to main numbers*. The statistical table will show selected past draws as if seven main numbers were drawn and the bonus number will be sorted into appropriate position in the main numbers. Also all the statistical properties will be recalculated for the seven main numbers so you will see for example odd/even ratio of e.g. 4:3.

Press *OK* button to confirm your selection, press *Cancel* to revert your changes.

See also Cut-off Draw Date and Draw Date Pre-Filter.

Select Filter

Select Filter window opens from menu *Package - Reduce - Filter Tickets* or when *Add filter* button is clicked in Complex Filter designer and shows the list of all filters available for the current lottery. Click any filter in the list and then press *Select* button to start Package filtering or to add the selected filter to a *Complex Filter*. You can also double-click the filter to select it.

The filters in this window can be customized the same ways as in the Filters window. However drag and drop isn't support in this window.

Button *Create New* at the bottom of this window opens a new *Complex Filter* window where you can design a new filter.

Start Page

Start Page window provides some useful hints and links for first-time users in *Get Started* section.

News section shows the latest discussion threads from Expert Lotto discussion board. Click any thread title to open it in your web browser.
Note: Internet connection is required to see content in this section.

If you don't want to open *Start Page* on application startup untick the option at the bottom of this window. To open *Start Page* again click menu *Help - Start Page*.

History Options

Levels & Segments

- **Levels** - specify how many Levels the History features will work with. The default value is 11, that means levels 0 to 10.

  ➤ You can adjust the Level count also conveniently using a spinner field in *History* toolbar.

- **Segments** - *specify how many segments the pool numbers will be divided to. The default value is 3. You can change the size of each segment and its color in the table below.*

- **Segment Sizes and Colors** - *enter the maximum difference for each segment. If the maximum difference for Segment 1 is e.g. 6, then this segment will contain numbers with History differences ranging from 1 to 6. If the maximum difference for Segment 2 is e.g. 12 then it will contain numbers with differences ranging from 7 (the size of previous segment plus one) to 12. The last segment always contains the numbers with the highest History differences.*
  Click button to the right of each segment to choose a different color for that segment.

- **Moving Average** - *enter the count of previous draws to calculate moving average curve in History charts.*

Estimates

These options apply to hints in My Estimates window.

- **Upper Range** - value to add to What If and Prediction hints to adjust the upper range of your estimate.
- **Lower Range** - value to subtract from What If and Prediction hints to adjust the lower range of your estimate.
- **Occurrence threshold** - the input fields show the percentage of the occurrence of the most frequent value from *simulation* results to define a section of the histogram to use as estimated range.

Ranges

Default ranges min and max define the default range of History differences. These values are used for example in In Range Differences and in Difference Ranges statistics.

Note: *This options panel opens from menu Tools - Options - History.*