Time Series Analyzer

Step-by-step Tutorial

version 1.1.0

C) Josef Pirkl 2010-2012

Web pages

Sorry for my English :-)

How to..[1]

New project

- ..create simplest the new project ?
- ..create new project with data from external text file ?
- ..create new DATA project with random generated data ?
- ..create project with seasonal support ?

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- ..read some data from project and use it for new project ?

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- ..show regression model ?
- ..change prediction interval range ?
- ..dock graph/list into dock sites ?
- ..compare two data series ?

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- ..change initial aplha smoothing factor in Exponential smoothing section ?

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- ..make permanent user changes in some graph in Graphbox ?

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- ..print selected graphs from all Graphboxs ?
- ..change printed graphs columns count ?
- ..remove graphs axis titles in printing ?

Contact

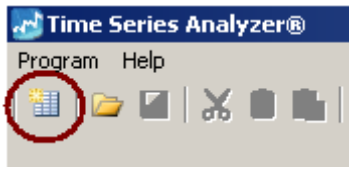
[1] Used pictures can be from older versions.

- Contact information.

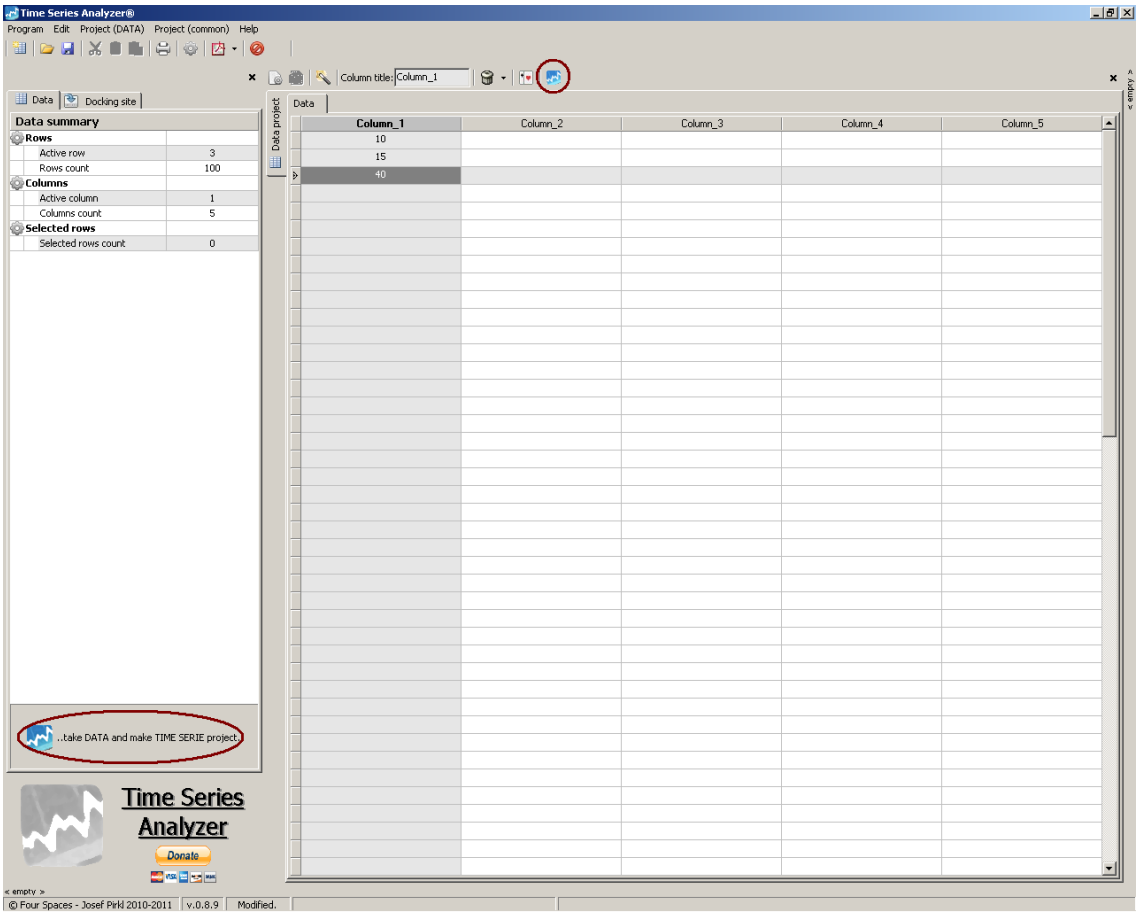
How to create the simplest new project ?

1. Run the application.

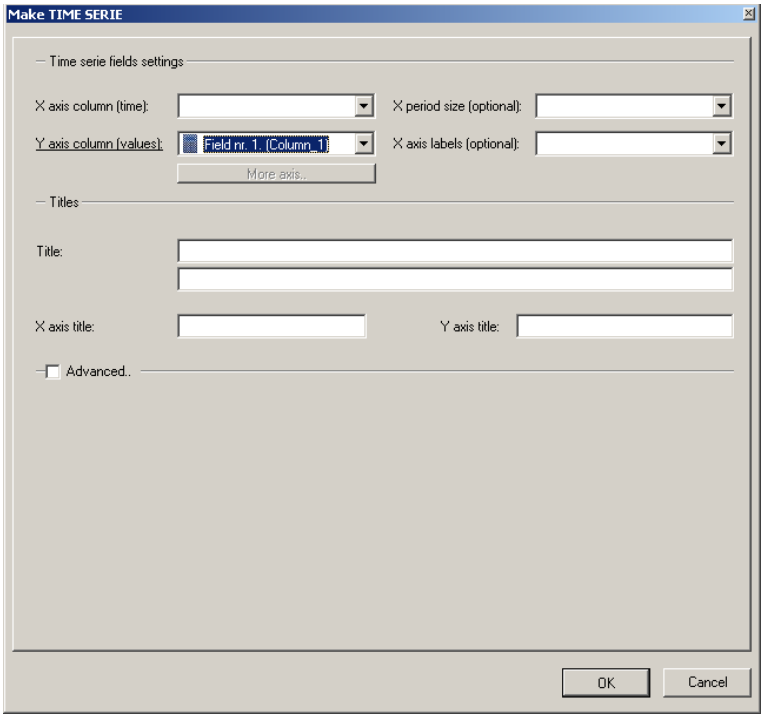
2. Click on the button for creating empty DATA project.



3. Add three new rows into first column. Then click on button (in toolbar above or left) for creating new TIME SERIE project.

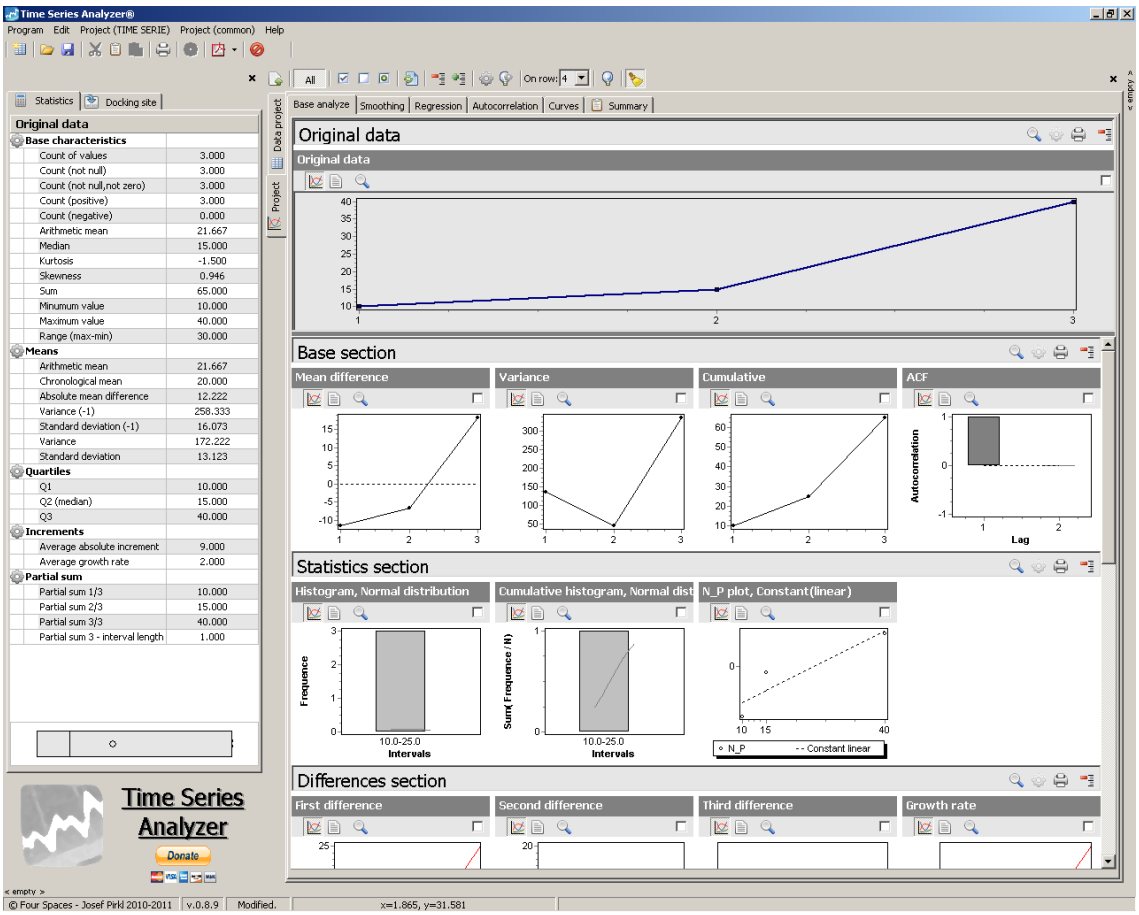


5. The "**Make TIME SERIE**" dialog is shown. Select column for "**Y axis column (values)**" Then click on "**OK**" button.



6. New time serie project is created !

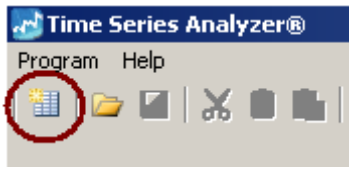
   You can save it by clicking on "**Save project**" in "**Program**" menu.



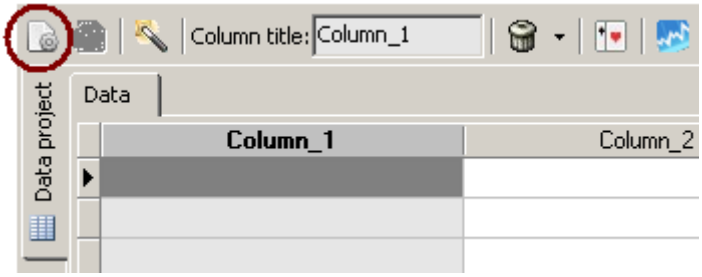
How to create new project with data from text file ?

1. Run the application.

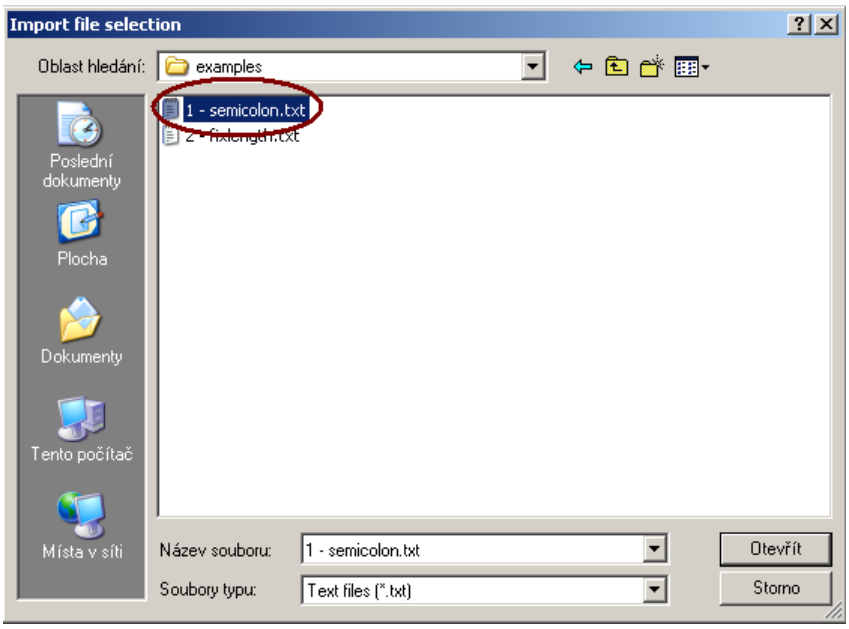
2. Click on the button for creating empty DATA project.



3. Click on button for showing "**Data import from text/excel file**" dialog.

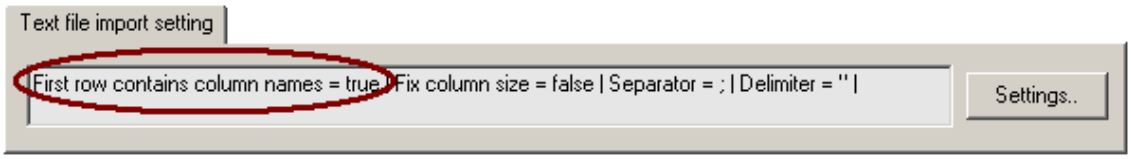


4. Select import file "***Examples\ 1 - semicolon.txt"*** [2].

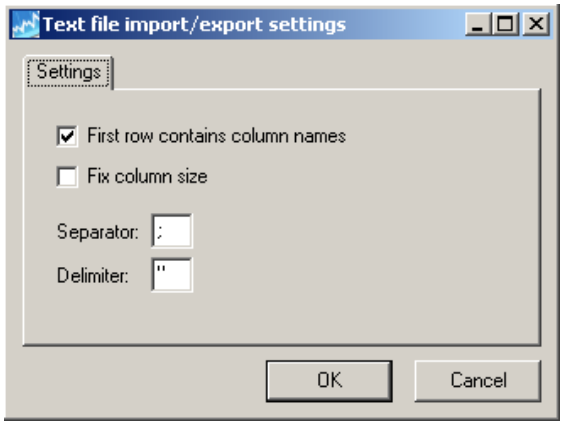


5. Check, if at dialog bottom is set "**First row contains column names = true**" (that specify, that first row is not data).

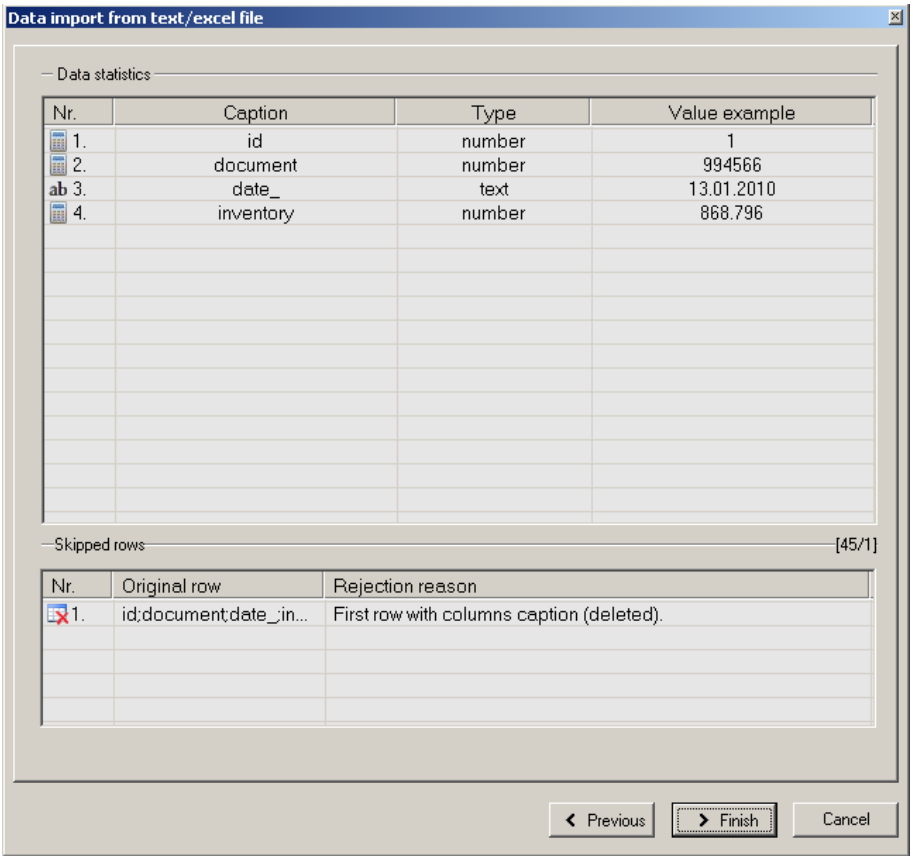
[2] "Examples" is subdirectory.



If there is **false** value then show "**Text file import/export settings**" dialog (by clicking on "**Settings..**" button), and change that setting here.

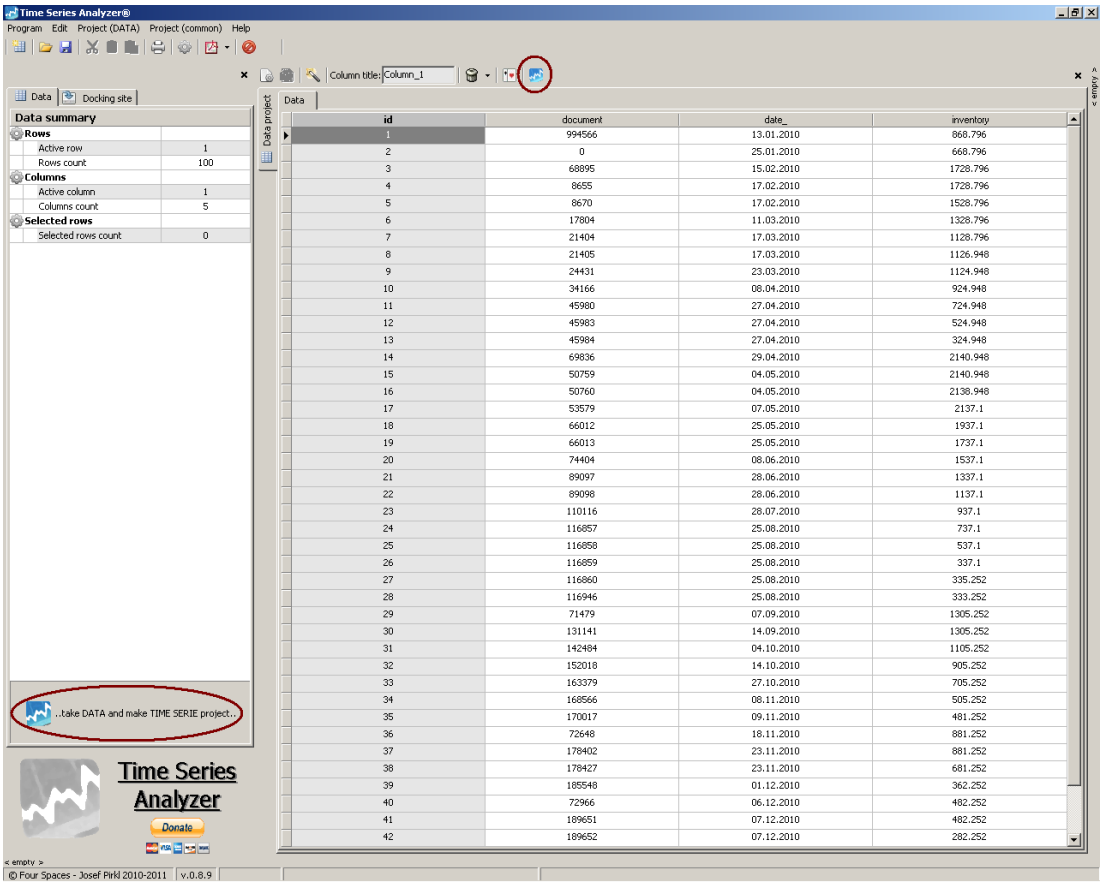


6. Click into "**Next"** button. You will be moved into next page, in background will be performed data file analyze. Now you can see data file analyze results.



7. Click again into "**Finish"** button.

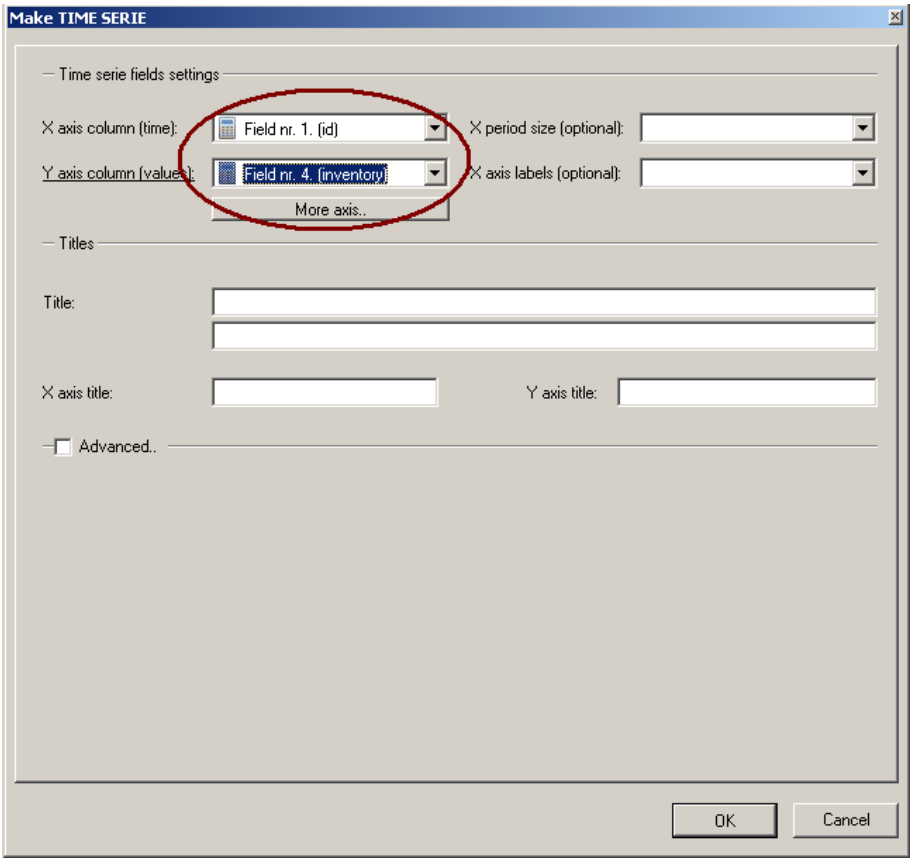
8. The data are now imported into DATA project list. Click on button (above or left) for creating new TIME SERIE project.



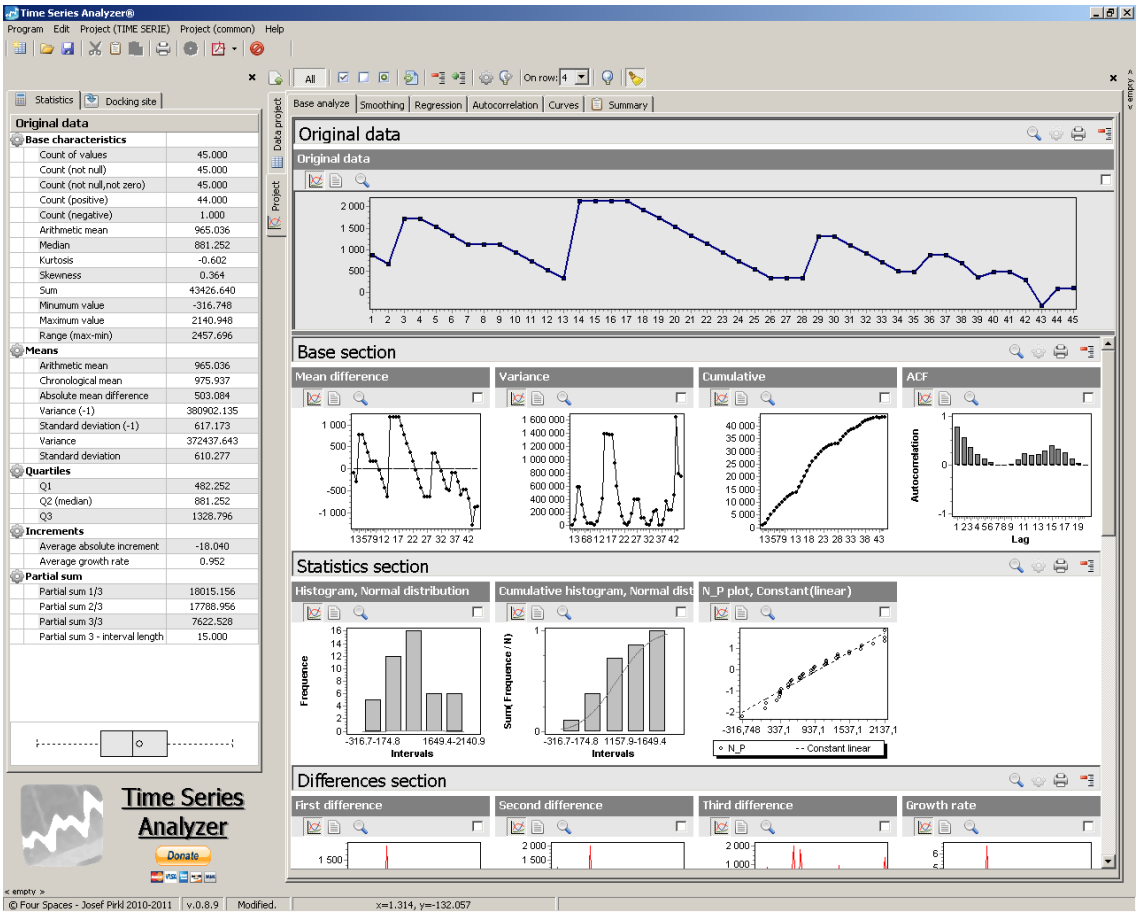
9. Here you must select at least that two fields:

1. **X axis column (time)** - set into "**ID**" field here[3]
2. **Y axis column (values)** - set into "**INVENTORY"** field here.

[3] Column is not mandary field yet (since version 0.7.0).

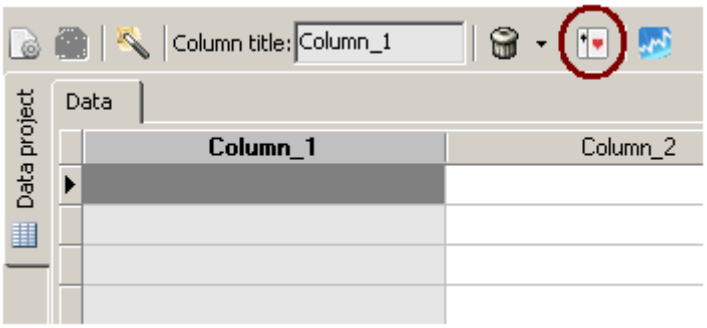


7. New project is created !

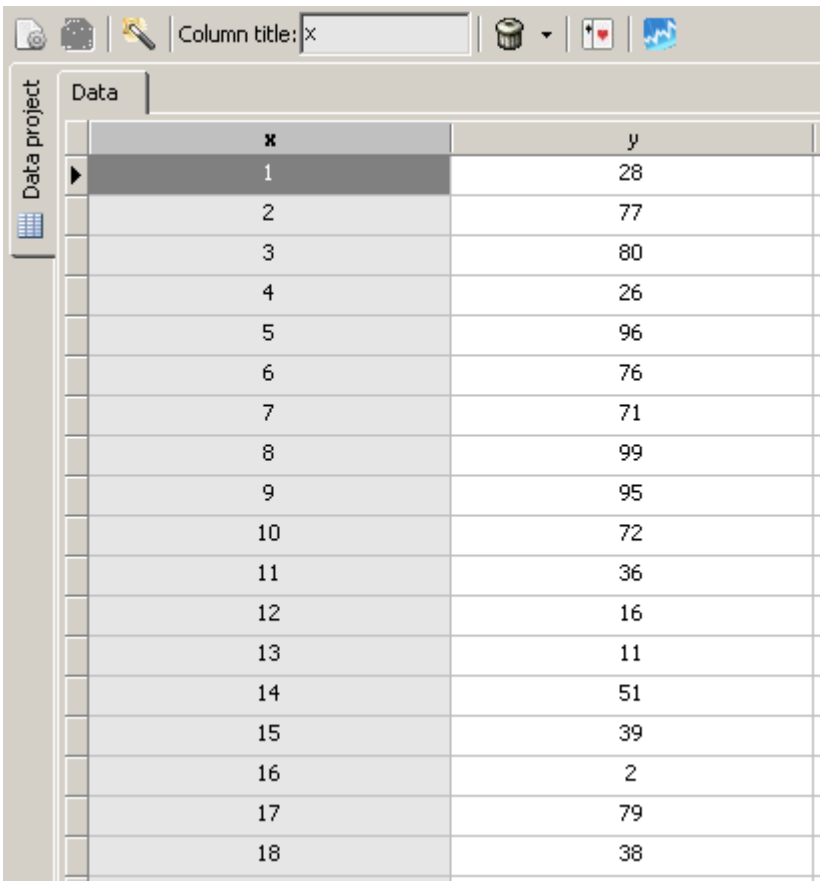


How to create new DATA project with random generated data ?

1. Steps are equivalent like in example How to create simplest new project ? only click on that button in DATA project toolbar.



By this button will be generated 25 rows of some random data, that will be used as base for new time serie project (..then use "**Make TIME SERIE project..**" menu item for TIME SERIE project creation).

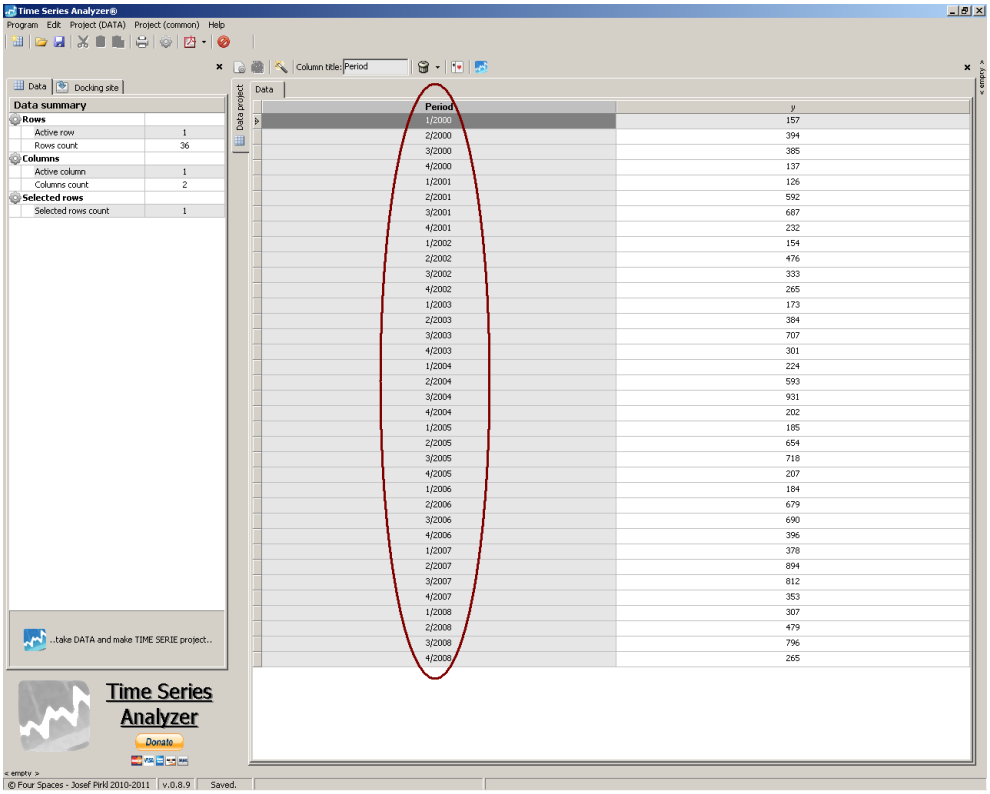


x	y
1	28
2	77
3	80
4	26
5	96
6	76
7	71
8	99
9	95
10	72
11	36
12	16
13	11
14	51
15	39
16	2
17	79
18	38

How to create project with seasonal support ?

1. Data for seasonal adjustment must contain seasonal key column, for example in form (for quarter description): 3/2011.

2. Next image shows DATA project with column with quarter description.

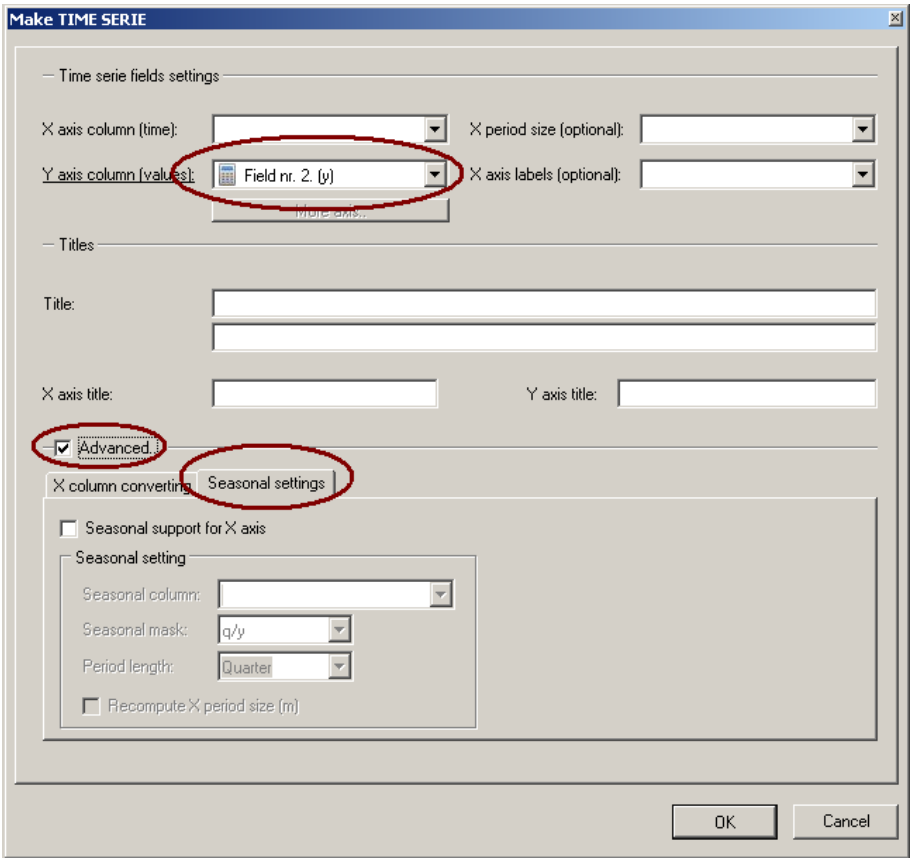


3. When you move into "**Make TIME SERIE..**" dialog you must select at least:

    1. **"Y axis column (values)"** - set into "**Field Nr. 2 (y)**" field here.

.

Click on the "**Advanced**" checkbox. Click on the "**Seasonal settings**" tab.

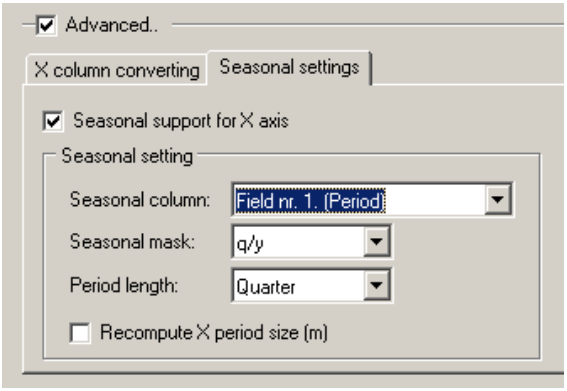


4. On the "**Seasonal settings**" tab make this changes:

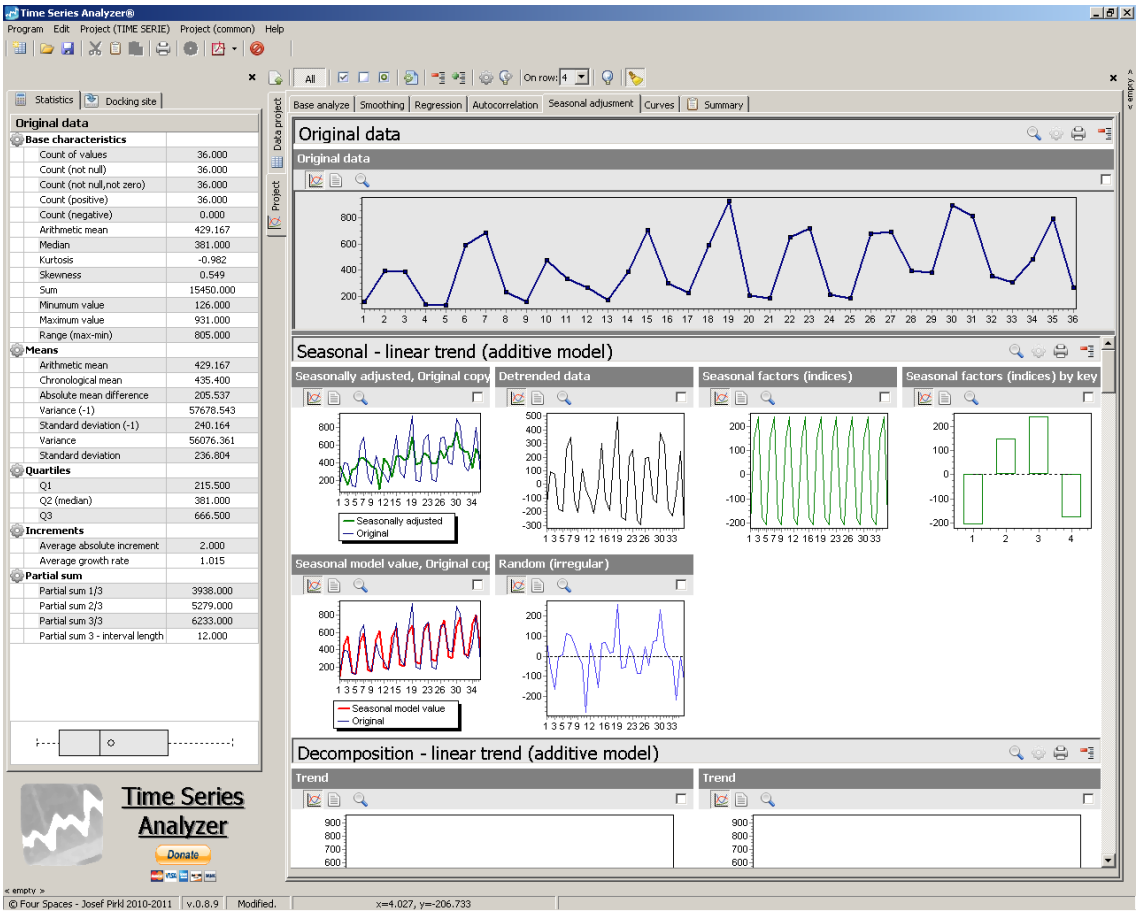
    1. Set "**Field nr. 1 (Period)**" into "**Seasonal column**".
       Seasonal column is column, which contains data with seasonal key, for example "3/2011" for quarter identification.

    2. Set "**q/y**" for "**seasonal mask**".
       That mask inform, that in the selected "**Seasonal column**" is information about quarter, year, separated in this case by slash.

    3. Select "**Period length**" for calculation.



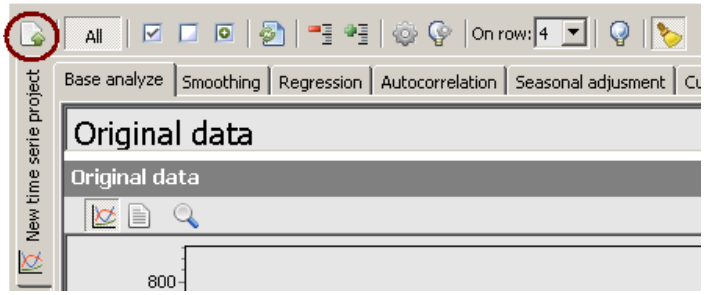
5. After clicking to "**Finish**" button is new project with seasonal adjustment created ! This project has special tab "**Seasonal adjustment**".



How to read some data from project and use it for new project ?

1. When you have opened some TIME SERIE project, is possible read its data and use it as base for new DATA project.

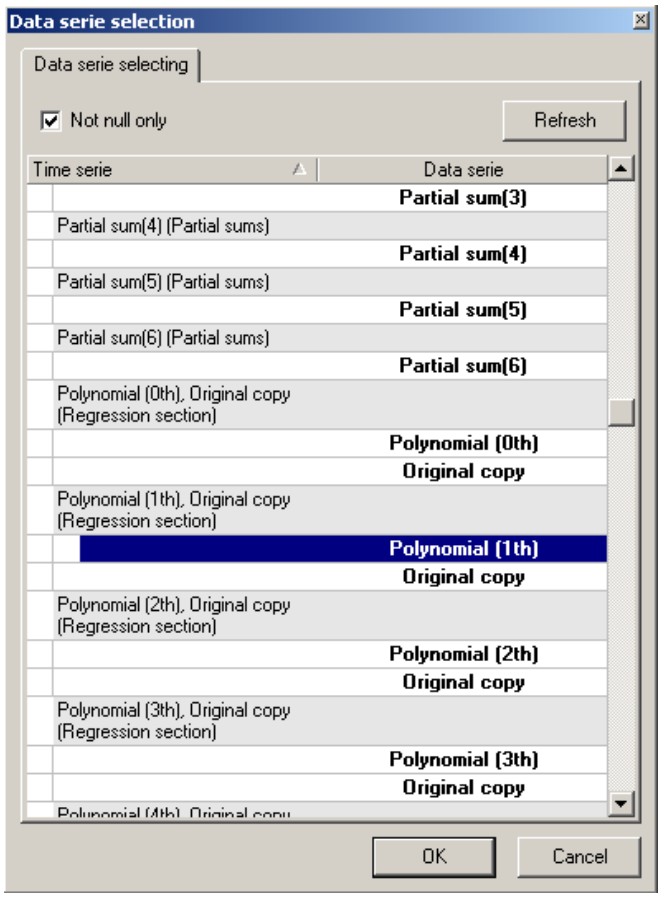
2. Click on the this button for opening "**Data serie selection**" dialog.



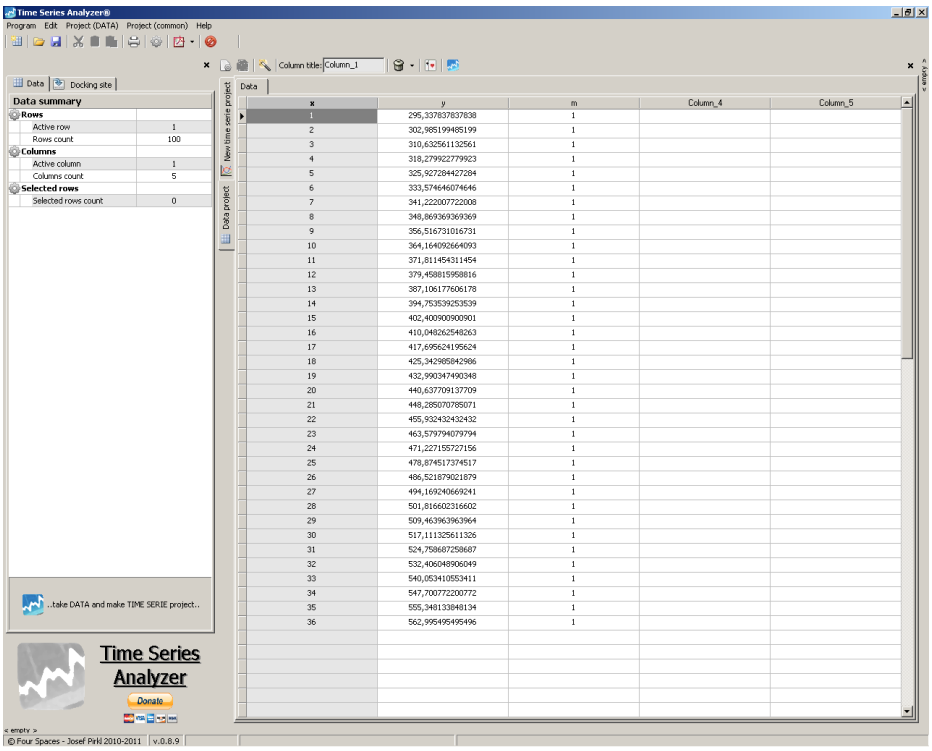
4. By "**Data serie selection**" is possible select data serie and read its data into "**Data creation**" dialog[4]. In this example is selected "**Polynomial 1th**" regression (linear regression).[5]

[4] Original data serie is on the top in the dialog.

[5] Is not supported NULL values for new project creation yet (0.7.0). Please, select data without NULL only.

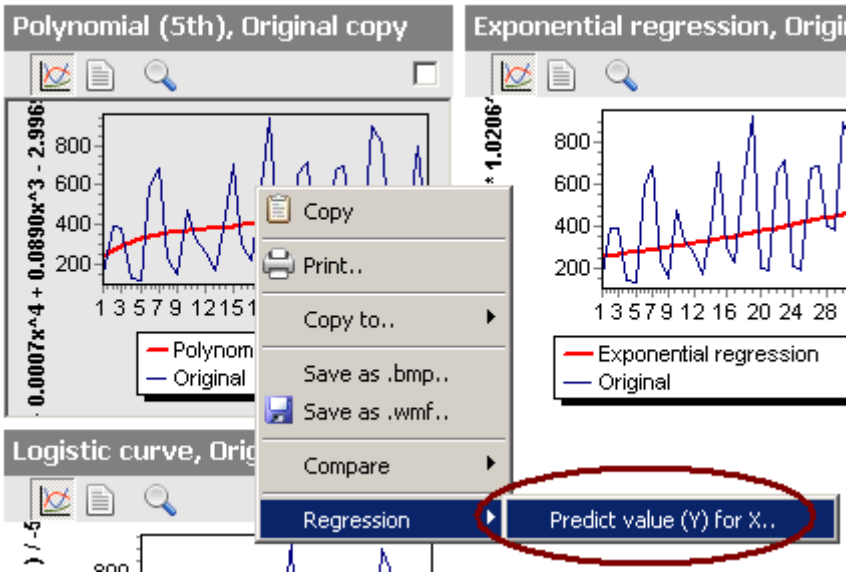


5. By clicking on "**OK**" button (or doubleclick on row) will be created new DATA project with selected series data.

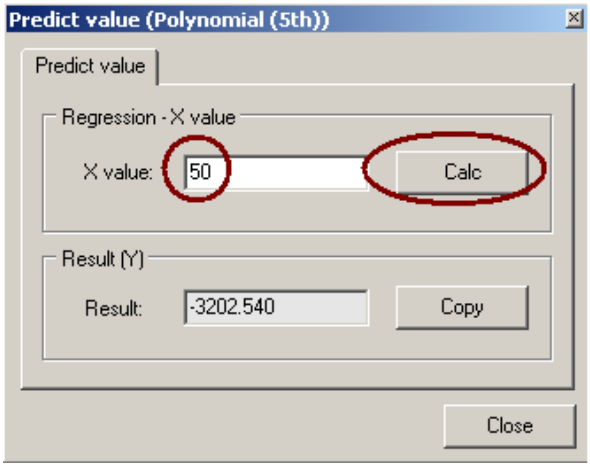


How to compute regression value for some X ?

1. On the graph in the Graphbox you can show context (popup) menu by right button mouse clicking. For the graph with regression data serie is then accessible "**Regression -> Predict value(Y) for X**" option.



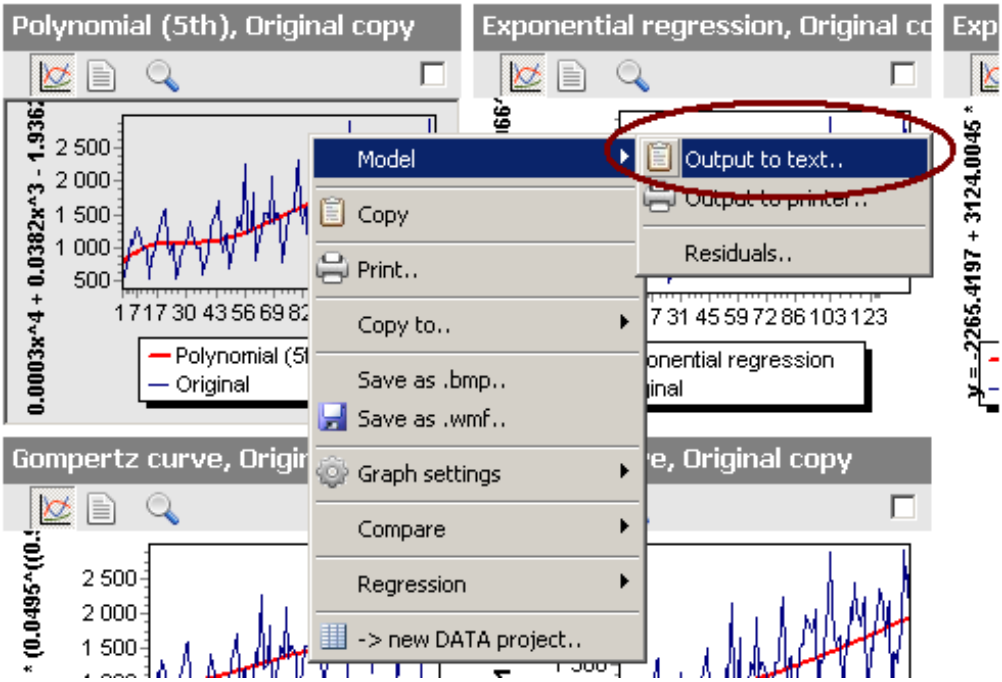
2. Click on that for show "**Predict value**" dialog. If you fill "**X value**", by clicking on "**Calc**" button you can compute "**Result**" - Y value.



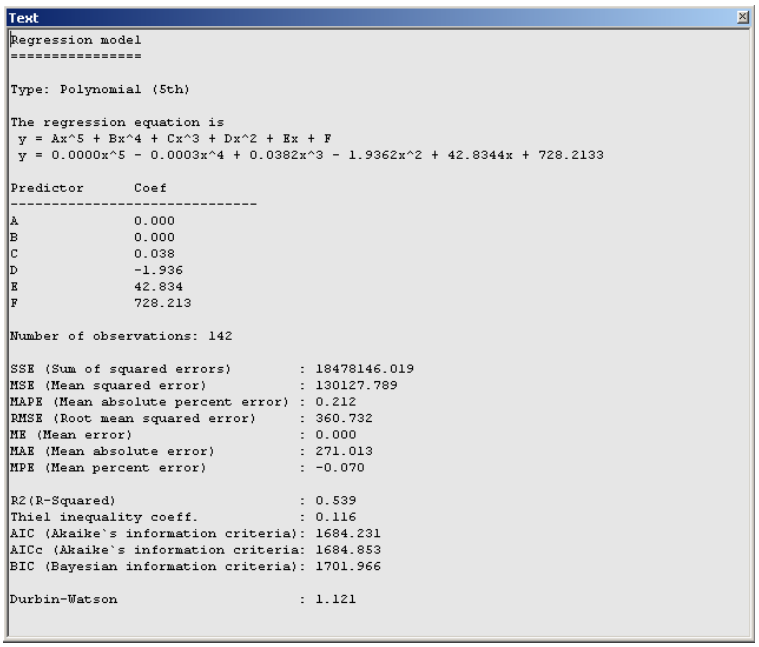
How to show regression model ?

1. On the graph in the Graphbox you can show detailed model informations.

   On graph (with model) click by right mouse buton a select "**Model -> Output to text**". For selected model are shown detailed model informations.



2. Detailed model informations could be printed.

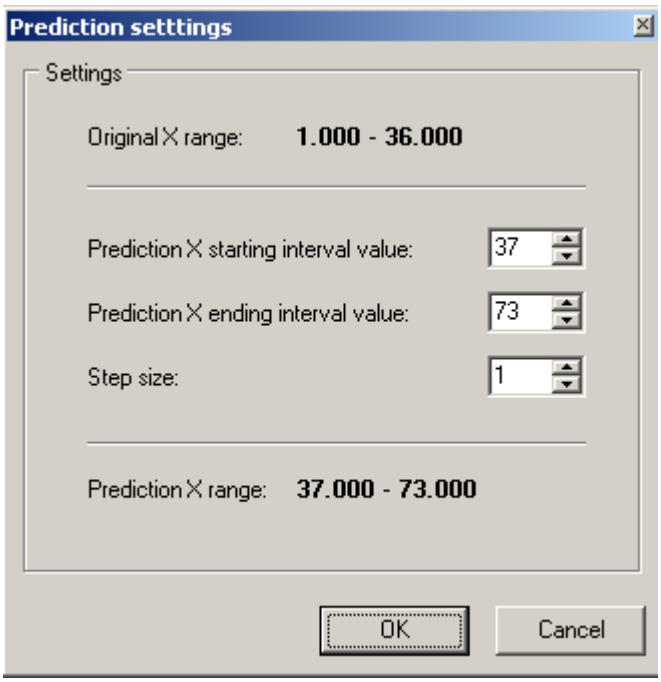


```
Text
Regression model
================

Type: Polynomial (5th)

The regression equation is
 y = Ax^5 + Bx^4 + Cx^3 + Dx^2 + Ex + F
 y = 0.0000x^5 - 0.0003x^4 + 0.0382x^3 - 1.9362x^2 + 42.8344x + 728.2133

Predictor       Coef
------------------------------
A               0.000
B               0.000
C               0.038
D               -1.936
E               42.834
F               728.213

Number of observations: 142

SSE (Sum of squared errors)        : 18478146.019
MSE (Mean squared error)           : 130127.789
MAPE (Mean absolute percent error) : 0.212
RMSE (Root mean squared error)     : 360.732
ME (Mean error)                    : 0.000
MAE (Mean absolute error)          : 271.013
MPE (Mean percent error)           : -0.070

R2(R-Squared)                      : 0.539
Thiel inequality coeff.            : 0.116
AIC (Akaike`s information criteria): 1684.231
AICc (Akaike`s information criteria: 1684.853
BIC (Bayesian information criteria): 1701.966

Durbin-Watson                      : 1.121
```

How to change prediction interval range ?

1. In opened TIME SERIE project click on "**Project prediction settings..**" button (next to "**Settings..**" button).

2. The "**Prediction settings..**" dialog will be shown. Change starting, ending interval, or step. Then click on "**OK**" button.



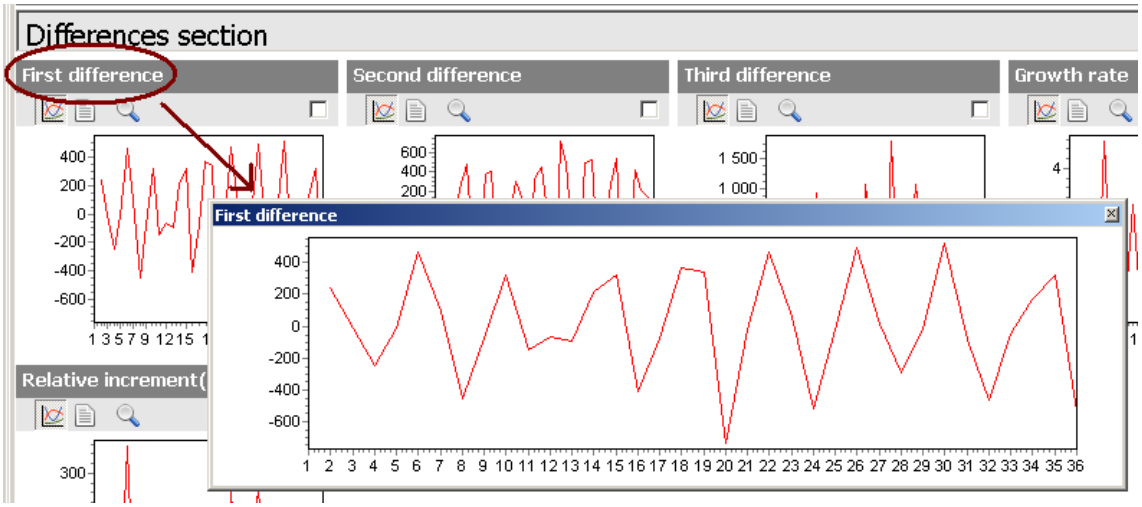
3. Prediction range interval for the project will be changed[6]. New interval size is saved into project file.

[6] For regression, mainly.

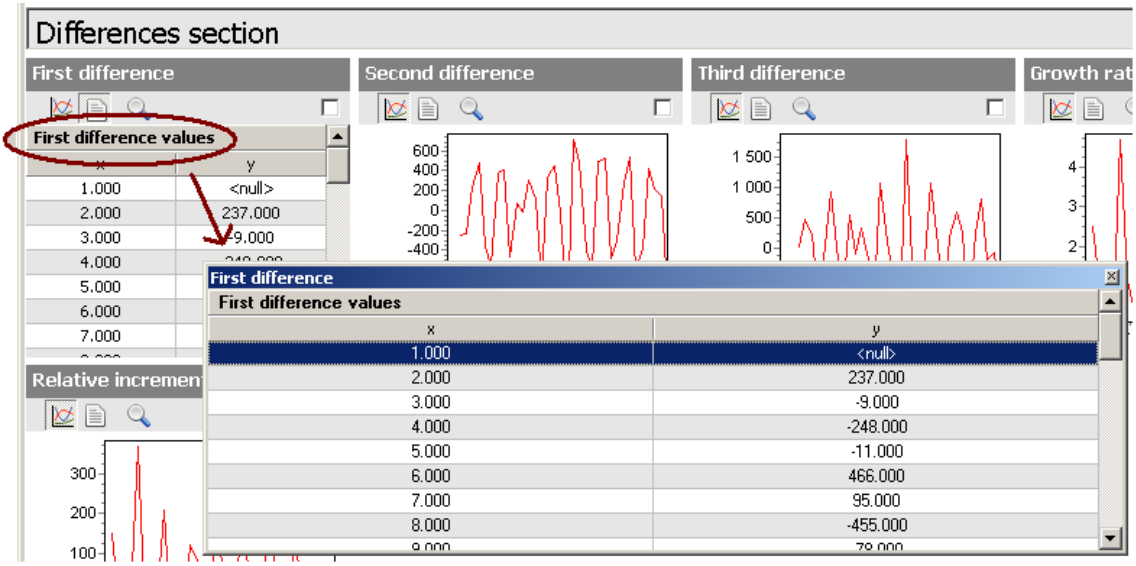
How to dock graph/list into dock sites ?

1. When you have opened some project, you can dock graph, list and some other window into dock sites.

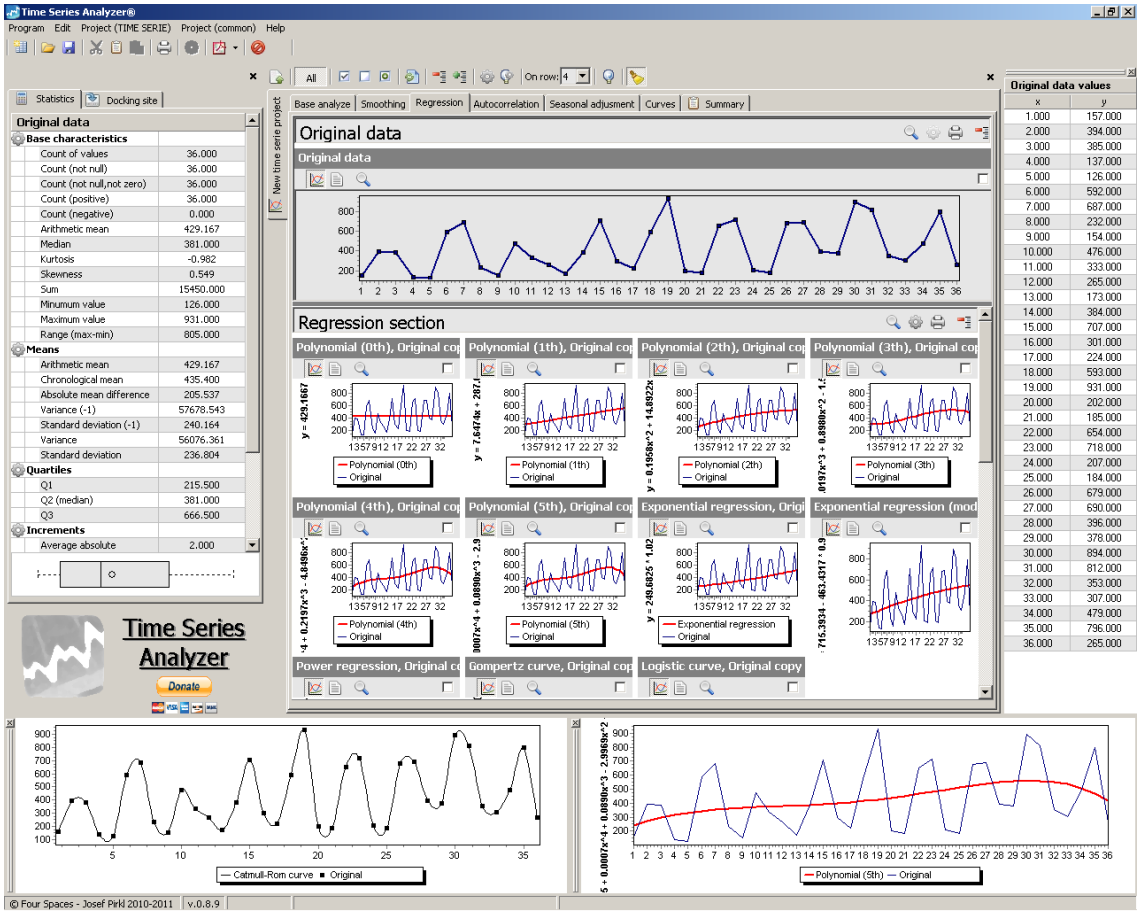
2. If you click on the graph title in Graphbox, the graph will be opened in window.



3. For lists - if you click on lists title in Graphbox, the list will be opened in window.



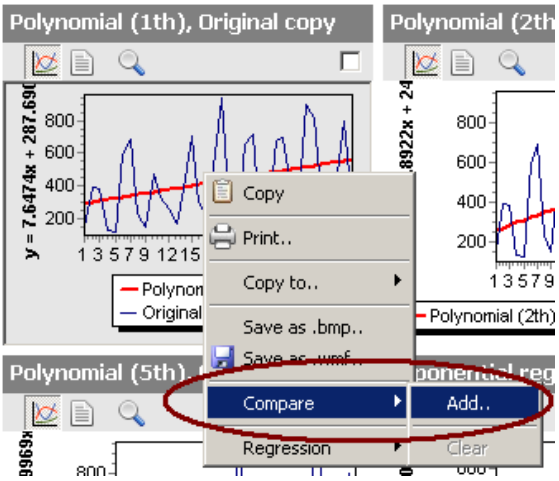
4. If you want, you can those window dock into left, right and bottom dock site (by mouse dragging). That docked window is saved into project file.


Time Series Analyzer®
Program Edit Project (TIME SERIE) Project (common) Help
Statistics Docking site
Original data
Base characteristics
Count of values 36.000
Count (not null) 36.000
Count (not null,not zero) 36.000
Count (positive) 36.000
Count (negative) 0.000
Arithmetic mean 429.167
Median 381.000
Kurtosis -0.982
Skewness 0.549
Sum 15450.000
Minumum value 126.000
Maximum value 931.000
Range (max-min) 805.000
Means
Arithmetic mean 429.167
Chronological mean 435.400
Absolute mean difference 205.537
Variance (-1) 57678.543
Standard deviation (-1) 240.164
Variance 56076.361
Standard deviation 236.804
Quartiles
Q1 215.500
Q2 (median) 381.000
Q3 666.500
Increments
Average absolute 2.000
Time Series Analyzer
Donate
New time serie project
All
On row: 4
Base analyze Smoothing Regression Autocorrelation Seasonal adjusment Curves Summary
Original data
Original data
Regression section
Polynomial (0th), Original cop
Polynomial (1th), Original cop
Polynomial (2th), Original cop
Polynomial (3th), Original cop
Polynomial (4th), Original cop
Polynomial (5th), Original cop
Exponential regression, Origi
Exponential regression (mod
Power regression, Original c
Gompertz curve, Original cop
Logistic curve, Original copy
Original data values
x y
1.000 157.000
2.000 394.000
3.000 385.000
4.000 137.000
5.000 126.000
6.000 592.000
7.000 687.000
8.000 232.000
9.000 154.000
10.000 476.000
11.000 333.000
12.000 265.000
13.000 173.000
14.000 384.000
15.000 707.000
16.000 301.000
17.000 224.000
18.000 593.000
19.000 931.000
20.000 202.000
21.000 185.000
22.000 654.000
23.000 718.000
24.000 207.000
25.000 184.000
26.000 679.000
27.000 690.000
28.000 396.000
29.000 378.000
30.000 894.000
31.000 812.000
32.000 353.000
33.000 307.000
34.000 479.000
35.000 796.000
36.000 265.000
Catmull-Rom curve Original
Polynomial (5th) Original
© Four Spaces - Josef Pirkl 2010-2011 v.0.8.9

How to compare two data series ?

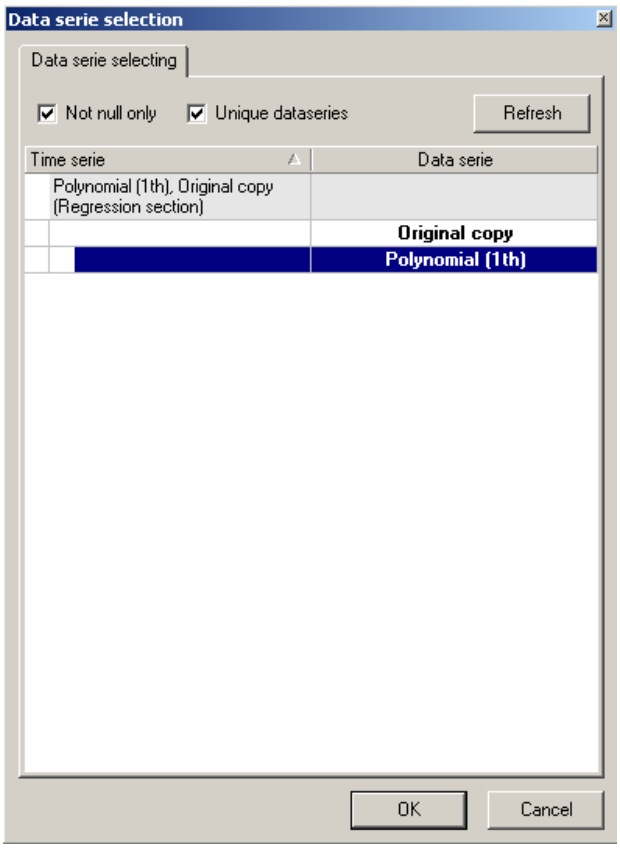
1. It is possible to compare two data series with special dialog.

2. On first graph (data serie) click with right mouse button, select "**Compare -> Add..**".[7]



3. If in the graph is only one data serie, that serie will be selected as first for comparing. If there are more data series, then will be shown "**Data serie selection**" dialog.

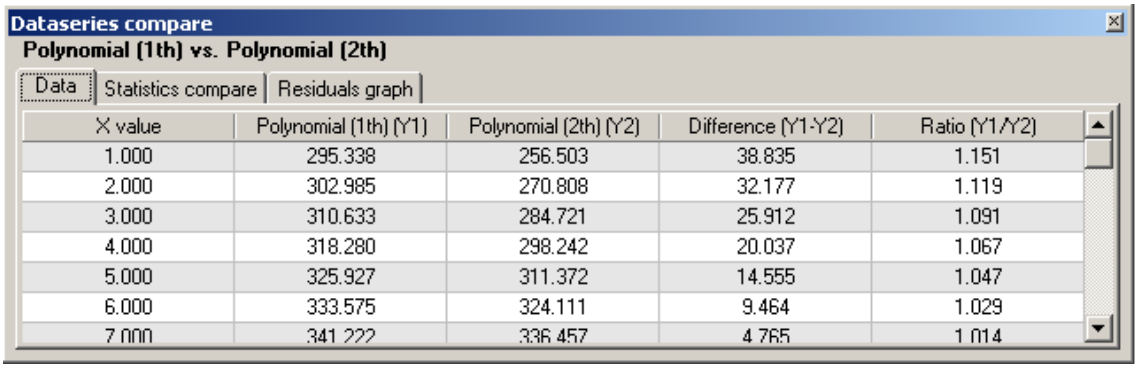
[7] Since version 0.7.4 is there command for fast adding "Original" data serie too.



4. Select first data serie (in this example "**Polynomial (1th)**").

5. Repeat that for secord serie, choose "**Polynomial (2th)**".

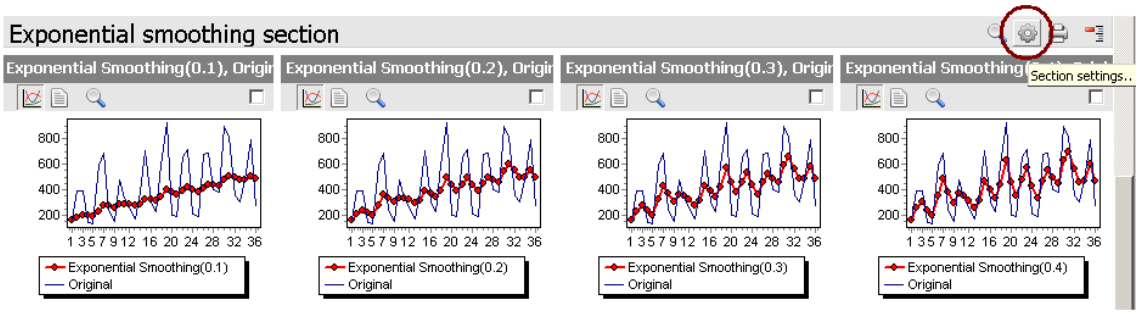
6. After finishing of second serie selection is shown "**Dataseries compare**" dialog. This dialog can be docked into specific dock site[8].



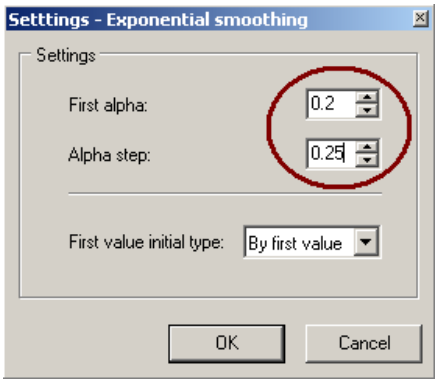
[8] "Dataseries compare" dialog is saved into project file.

How to change initial aplha smoothing factor in Exponential smoothing section ?

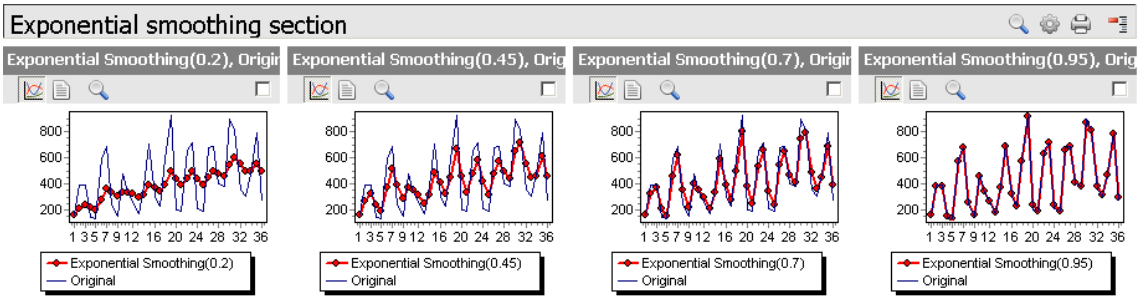
1. On some sections is possible to display "**Section settings**" dialog by clicking on "**Section settings**" button.



2. In "**Settings - Exponential smoothing**" dialog change "**First alpha**" to 0.2 and "**Alpha step**" to 0.25.



3. Alter click on the "**OK**" button the all "**Exponential smoothing section**" will be recalculated and refreshed. In the section will be time series with aplha = 0.2, 0.45, 0.7 and 0.95.[9]

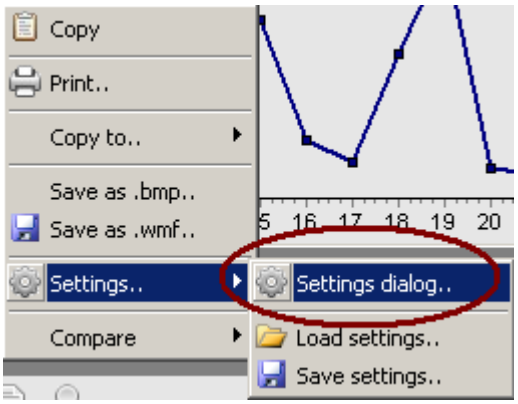


[9] New settings for section will be saved into project file for next opening.

How to make permanent user changes in some graph in Graphbox ?

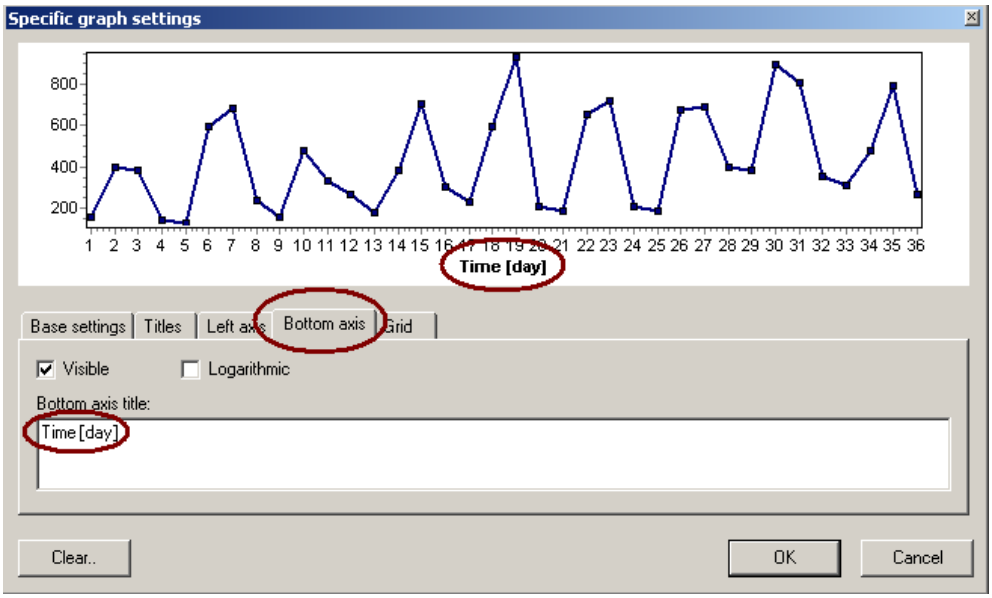
1. On every graph is possible make some permanent user changes. This changes are saved into project file and are restored in next project loading.

2. Click by right mouse button on the graph for displaing graph context menu. Click on the "**Settings dialog..**".



3. It display "**Specific graph settings**" dialog.

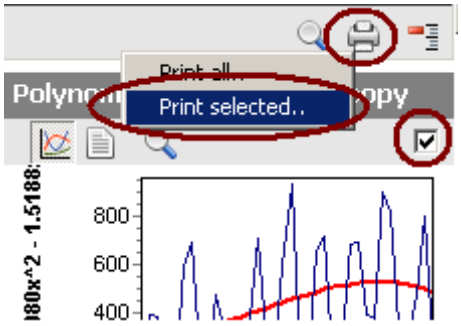
Click on the "**Bottom axis**" page, and write new title for bottom axis.



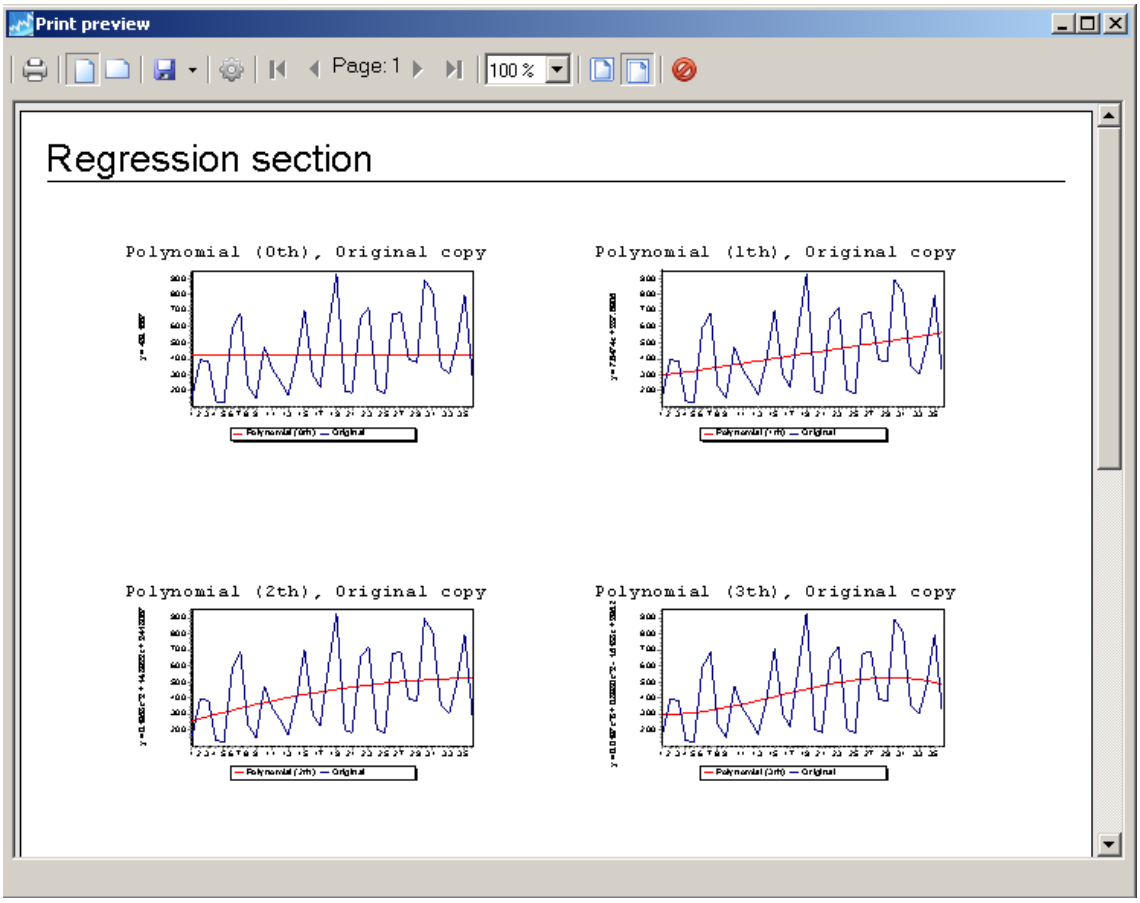
4. After click on the "**OK**" button the graph will be refreshed.

How to print selected graphs in section ?

1. It is possible to print all or selected graphs in every Graphbox section. Click on "**Print**" button above section and choose "**Print selected..**".



2. If some graphs in section are selected (checkbox above graph), then is shown "**Print preview**" dialog[10].

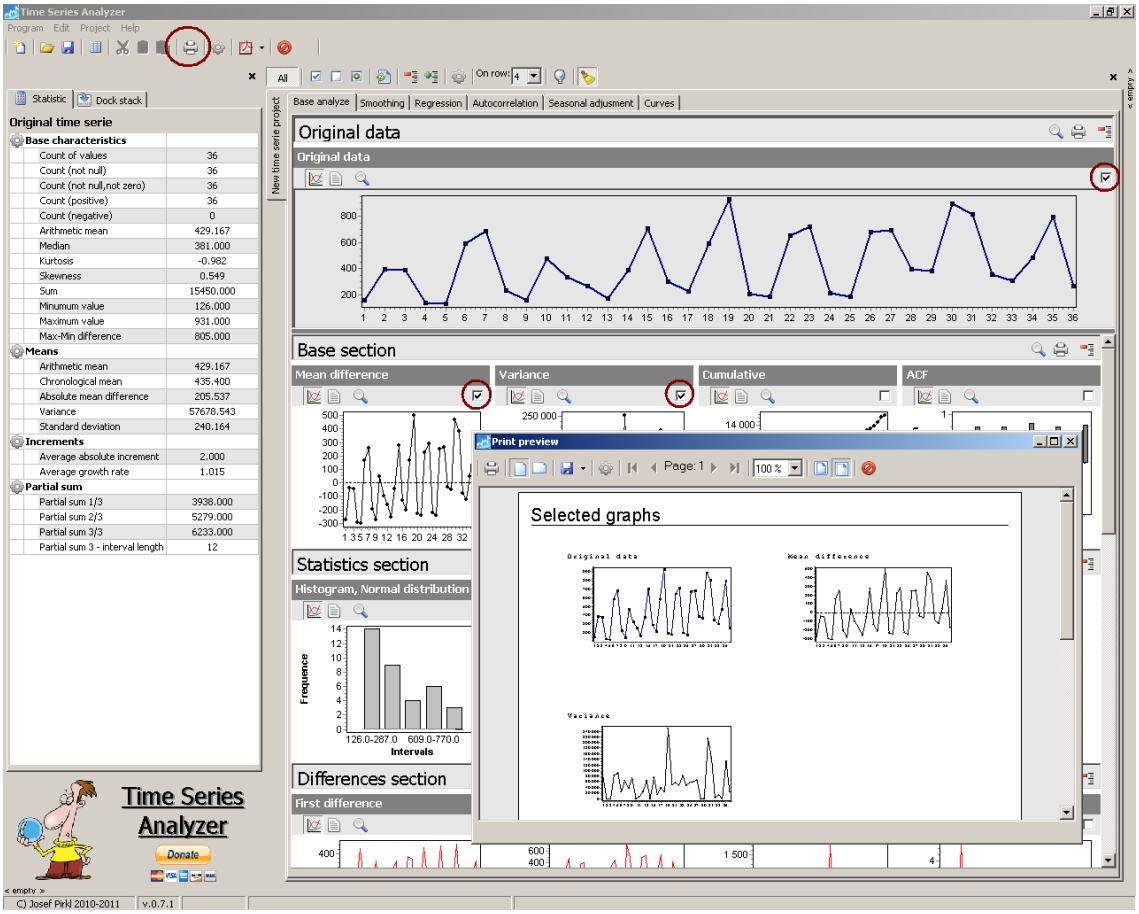


[10] Default setting - other variant is direct print without "Print preview" dialog.

How to print selected graphs from all Graphboxs ?

1. If are some graphs selected, is possible to print that selected graphs through all project`s Graphboxs.

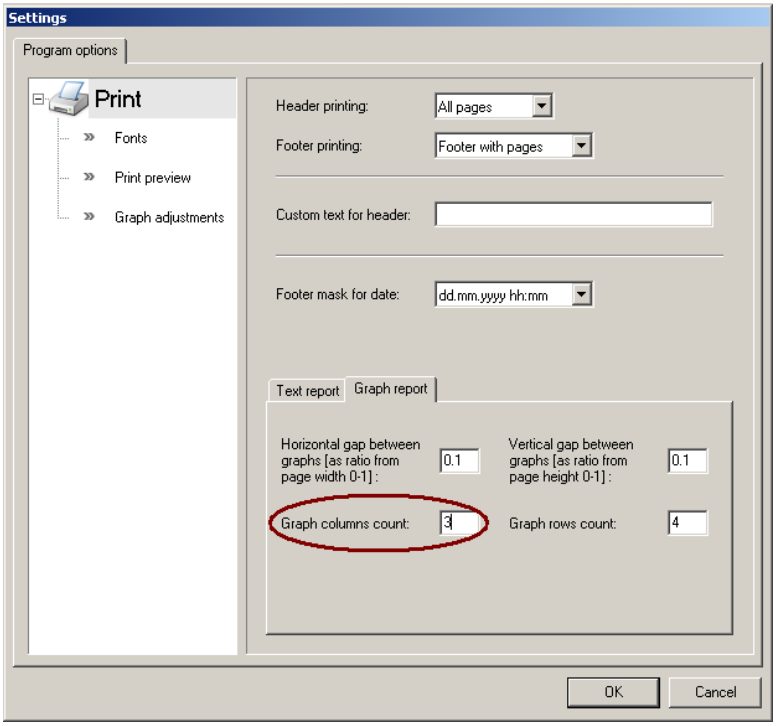
2. Click on "**Print**" button on main toolbar, or in main "**Program**" menu. Selected project`s graphs will be printed.



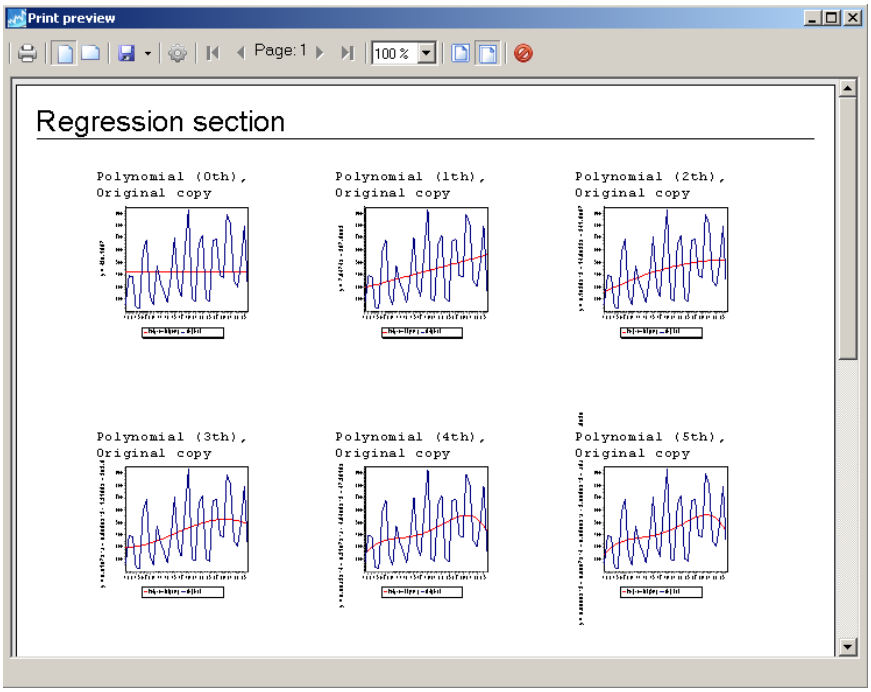
How to change printed graphs columns count ?

1. If you have some graphs for printing, from "**Print preview**" dialog is possible to change some print report characteristics. Click on "**Print settings..**" button.

2. After click is displayed "**Settings**" dialog with "**Printing**" settings only. Change "**Graph columns count**" to 3 and then click on "**OK**" button.



3. Report layout will be refreshed (three graphs at row).[11]

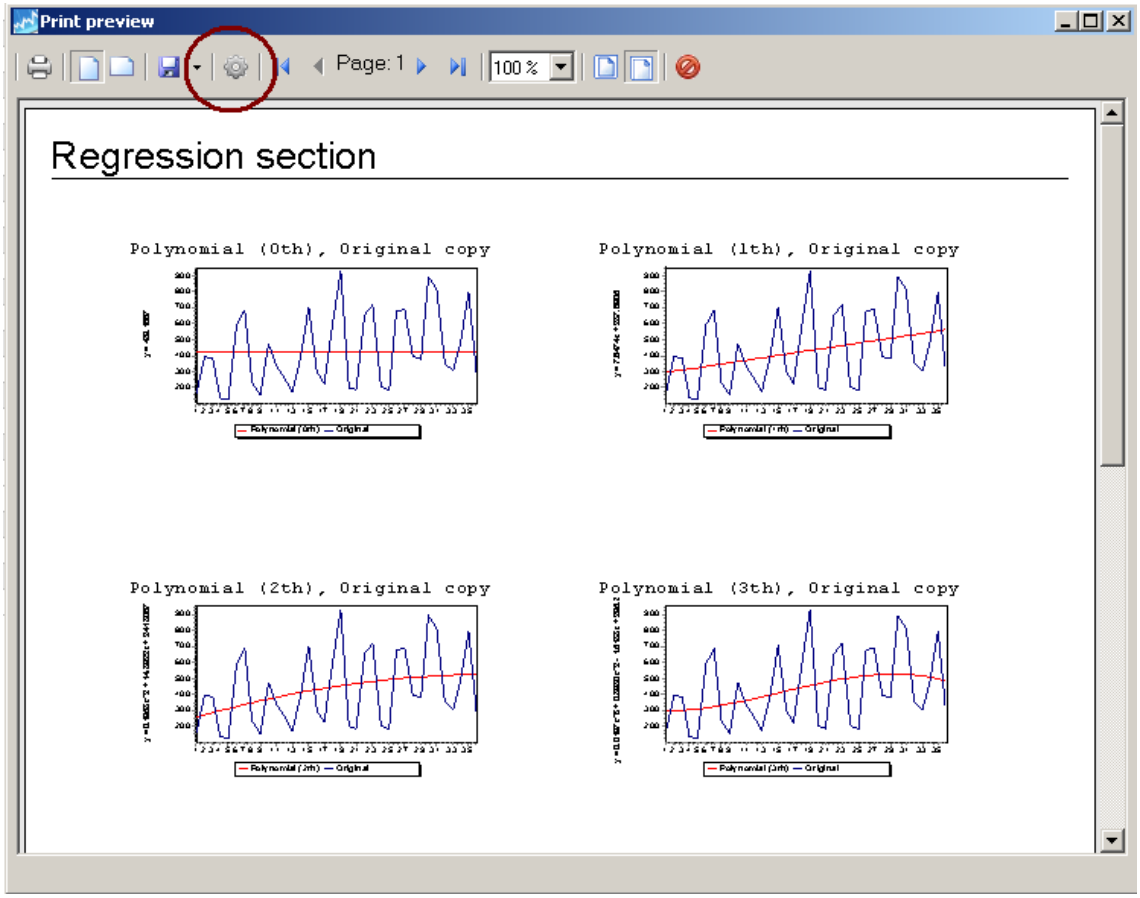


[11] Changes will be saved into application settings.

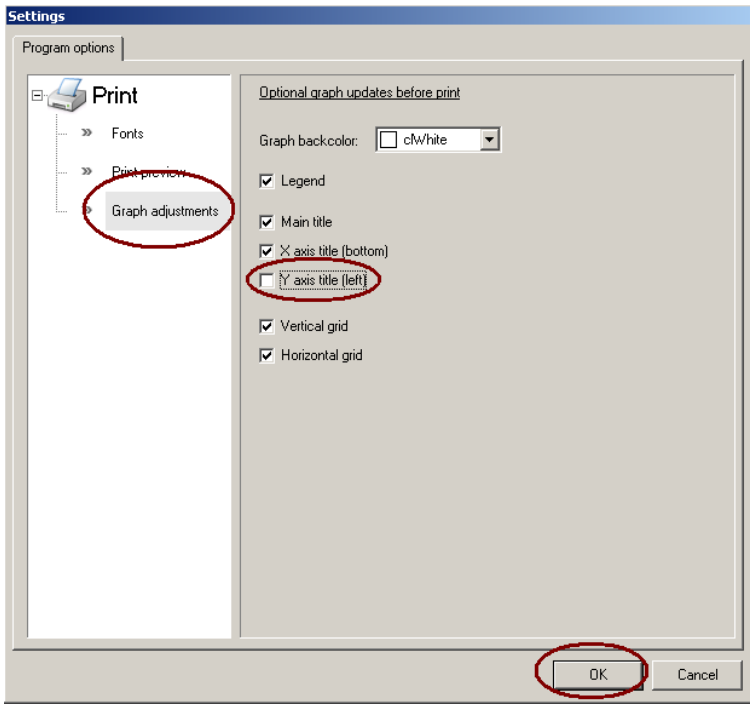
How to remove graphs axis titles in printing ?

1. Before every graph printing is possible to "filter" its properties and update its layout.

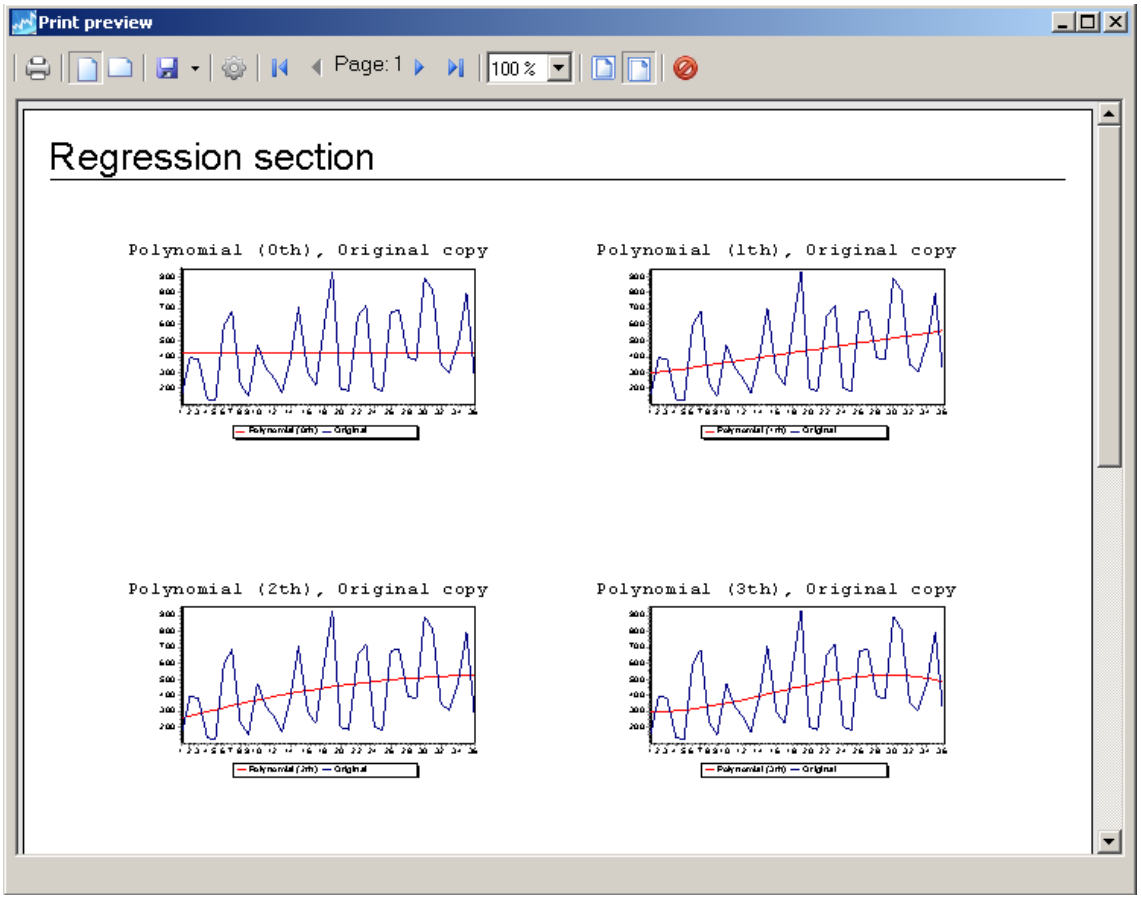
2. Suppose, we have this output for section printing. For removing left graphs axis titles, click on "**Print settings..**" button in toolbar.



3. In "**Settings**" dialog go into "**Graph adjustment**" page. Uncheck option "**Y axis title (left)**" here.



4. After "**OK**" button clicking the report will be refreshed. Left axis in graphs is removed[12].



[12] Changes will be saved into application settings.

Contact information

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