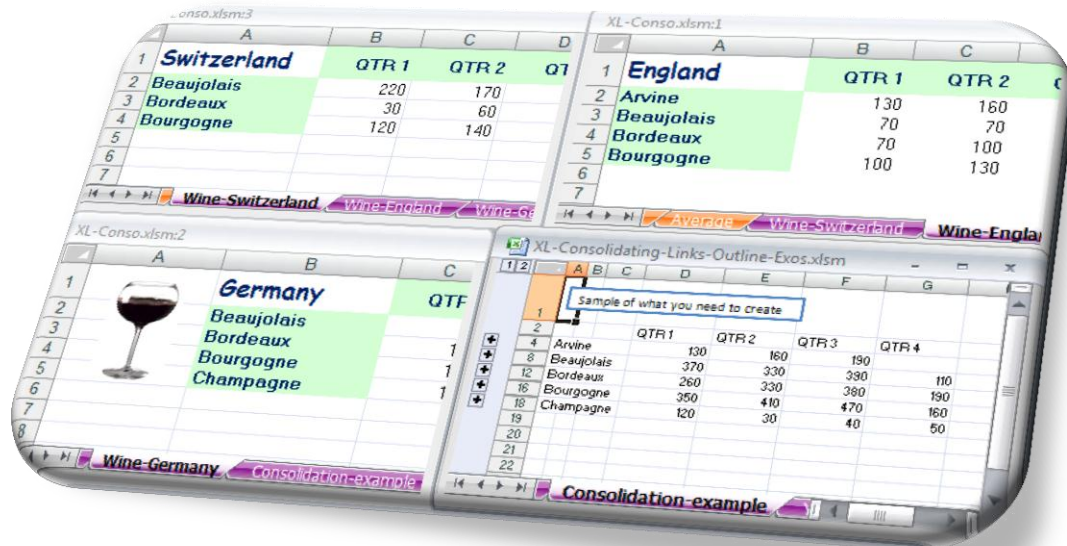


# Office Doc



## MS-OFFICE 2007 *English version*

### EXCEL

Consolidations – Outline  
Custom views  
Analysis tools  
(tables, scenarios, solver ...)

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## Important comment related to functionalities using Excel functions

It is important to remind you that the format of numbers, dates and so on depend on the country set in Windows (Control Panel - Icon REGIONAL SETTINGS). These settings include the thousand separator (apostrophe or comma ?), the list separator (semi-colon or comma ?) etc.  
For this documentation, the computer used for screen captures was set in **French(Swiss)**.

Decimal symbol:	<input type="text" value="."/>
No. of digits after decimal:	<input type="text" value="2"/>
Digit grouping symbol:	<input type="text" value=" '"/>
Digit grouping:	<input type="text" value="123'456'789"/>
Negative sign symbol:	<input type="text" value="-"/>
Negative number format:	<input type="text" value="-1.1"/>
Display leading zeros:	<input type="text" value="0.7"/>
List separator:	<input type="text" value=";"/>
Measurement system:	<input type="text" value="Metric"/>
Standard digits:	<input type="text" value="0123456789"/>
Use native digits:	<input type="text" value="Never"/>

Click Reset to restore the system default settings for numbers, currency, time, and date.

### Digit grouping symbol

Thousand separator

' for Switzerland  
space for France  
, for the USA

### List separator

Symbol used to separate the arguments in a function.

=IF(condition;true;false)

; for France, Switzerland)  
, for England, USA

Numbers Currency Time **Date**

Example

Short date:

Long date:

Date formats

Short date:

Long date:

What the notations mean:  
d, dd = day; ddd, dddd = day of week; M = month; y = year

Calendar

When a two-digit year is entered, interpret it as a year between:


and

As installing *Multilanguage Packs* for Windows and Office becomes more and more frequent, the language of the Excel interface might be different from the one set in Windows. Therefore check.

# 1 Consolidation

## 1.1 Simple using a 3D reference

The cells reference (their "address" such as B4, C18 ...) must be identical and the sheets to consolidate must be consecutive.

	A	B	C	D	E
1	<b>Reading: a passion!</b> 				
2					
3					
4					
5					
6					
7	<b>Top sales - Harry Potter</b>				
8					
9	<b>Title</b>	<b>January</b>	<b>February</b>	<b>March</b>	<b>Total Qtr1</b>
10	Harry Potter and the Sorcerer's Stone	60	100	92	252
11	Harry Potter and the Chamber of Secrets	70	89	46	205
12	Harry Potter and the Prisoner of Azkaban	80	69	95	244
13	Harry Potter and the Goblet of Fire	83	40	98	221
14	Harry Potter and the Order of the Phoenix	80	98	85	263
15	Harry Potter and the Half-Blood Prince	65	79	89	233
16	Harry Potter and the Deathly Hallows	90	50	60	200
17					

Tables on Qtr1, Qtr2, Qtr3 et Qtr2 are strictly identical in term of location, structure, even color. The last table on the Year-total sheet is empty.

- Activate the sheet *Year-total*

7	<b>Top sales - Harry Potter</b>	
8		
9	<b>Title</b>	<b>Total</b>
10	Harry Potter and the Sorcerer's Stone	
11	Harry Potter and the Chamber of Secrets	
12	Harry Potter and the Prisoner of Azkaban	
13	Harry Potter and the Goblet of Fire	
14	Harry Potter and the Order of the Phoenix	
15	Harry Potter and the Half-Blood Prince	
16	Harry Potter and the Deathly Hallows	

- Click in the cell where the first result is required – here on B11.
- Click on the SUM button (HOME Tab – EDITING Group)
- Activate the first sheet and click on the first cell that will be added (here E10)
- SHIFT + click on the **tab** of the last sheet to be consolidated.
- ENTER

Here below the formula on the consolidation sheet (Year-total) :



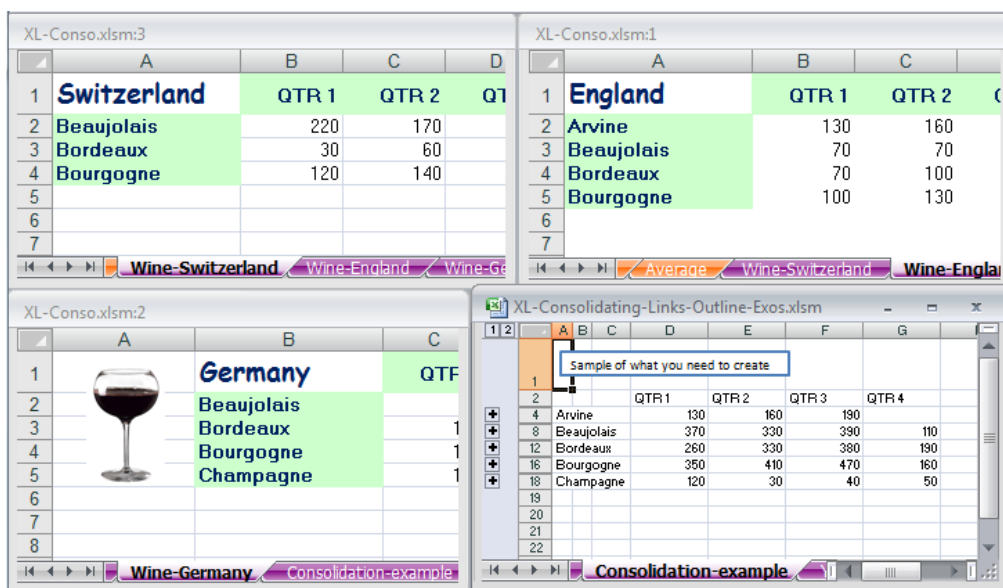
Sum on the sheets Qtr1 to Qtr4, each time the cell E10

- Drag the autofill handle to fill in the table

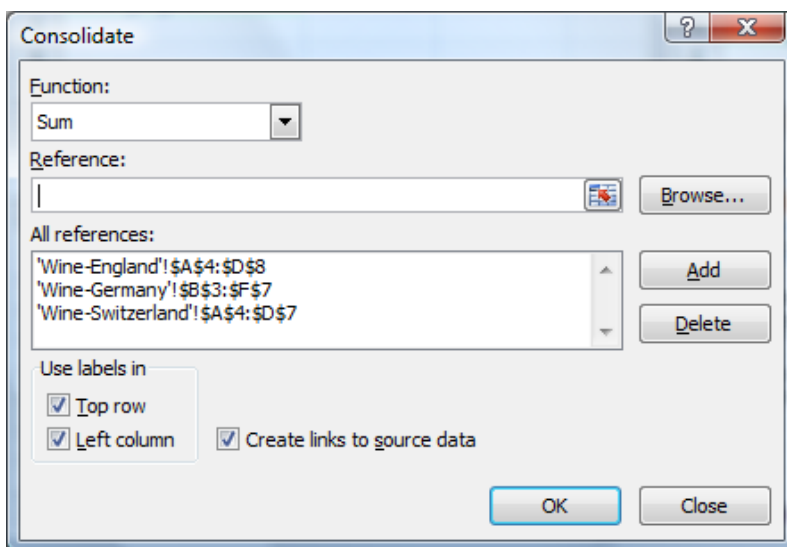
## 1.2 Consolidation using DATA - CONSOLIDATE

*Advantage : you may consolidate tables that are not strictly identical and the consolidated results can be linked to their source cells through the outline view mode.*

Here below a screen capture showing a workbook with three sheets that have been consolidated into a fourth one :




- Activate the "corner" cell of the future consolidation, in the destination sheet or workbook (here the cell A1 on CONSOLIDATION-EXAMPLE (that would be empty of course).
- DATA tab – DATA TOOLS Group – CONSOLIDATE Button.



- Function** The consolidation = adding several sheets, subtracting them or multiplying their data ?
- Reference** In order to collect the required data, make sure the cursor is placed in this box. Then you activate the first sheet and select the range of cells. Finally you click on the ADD button.
- Note : if the data includes labels in line or columns, it is necessary to include them in the selection.*
- Using a name instead of a range of cells:  
*Sheet inside current workbook : type the name*  
*Sheet of another workbook : activate the workbook and the required sheet and then type the name*
- Use labels in** Check the boxes corresponding to the required labels. They will be displayed in the consolidated result.
- Link to source data** The consolidation will be in the outline form. A link will exist between the source sheet (or file) and the client sheet (or file).
- Caution : if the option is not activated the result will be a simple consolidation inserted at the active cell.*
- BROWSE ... Button** To consolidate ranges of cells located in external workbooks. But caution, these files will not be opened. You can manually type in the range of cells or better its name (provided you know the address or the name). *Caution : do not use HOME or any arrow in this box as this selects cells in the current sheet.*



- The collected references remain in DATA - CONSOLIDATE in case you wish to run the consolidation again or change its settings. This is important if you need to modify the data source. If you change the figures, the update is automatic. If the reference areas are the same but you have changed some labels, you can simply run the consolidation function again. If the changes are important, it is advisable to run a new consolidation.
- To remove the outline  
 DATA Tab – OUTLINE Group – Drop-down list of the UNGROUP Button – CLEAR OUTLINE Option. All rows and columns will be displayed.  
 Caution : no undo for this operation.
- Selecting the visible cells only (on a collapsed outline) : (to create a chart for example)  
 Collapse outline to required levels and select the area.  
 HOME Tab – EDITING Group – Drop-down list of the FIND & SELECT Button – GO TO SPECIAL Option – In the dialog box : VISIBLE CELLS ONLY.

You can also add this button :  to the Quick Access toolbar. Caution, scroll down the list to the "s" section (for Select visible cells).

## 2 The outline

### 2.1 Generalities

A powerful tool to make the structure of a table more apparent, to improve the navigation when the worksheet contains very large data.

#### When to create an outline

When you need to hide rows or columns in a table in order to improve its readability. The rows or columns that will be less frequently used are grouped together. Far more comfortable than *hiding* them.

If there is a hierarchy in the data - that is if some data can be grouped under one topic and several topics can also be grouped together etc... then an outline can be created

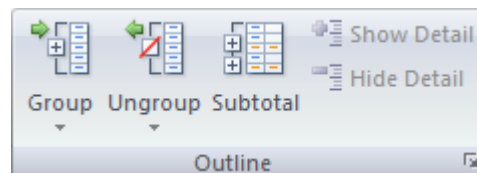
Several functionalities generate an outline : when you add subtotals to a list, when you consolidate data and choose to link them to their source ...

*Automatic*      Excel analyzes the formulas - if they are the result of others - and groups them.

*Manual*          There are no formulas, the hierarchy is set by the user.

### 2.2 Generating the outline

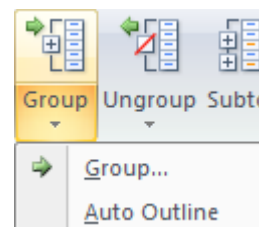
DATA Tab – OUTLINE Group



#### 2.2.1 Automatic

The outline will be automatic if Excel can work on formulas/functions that work globally on rows or columns.

Drop-down list of the GROUP Button - AUTO OUTLINE Button :



	A	B	C	D	E	F	G	H	I	J
1		janv.08	févr.08	mars.08	Total Qtr 1	avr.08	mai.08	juin.08	Total Qtr 2	Total Semester
2	Sales	150000	200000	250000	600000	300000	350000	400000	1050000	1650000
3	Fixed Costs	30000	30000	30000	90000	30000	30000	30000	90000	180000
4	Variable Costs	30000	40000	50000	120000	60000	70000	80000	210000	330000
5	Total Costs	60000	70000	80000	210000	90000	100000	110000	300000	510000
6	Result	90000	130000	170000	390000	210000	250000	290000	750000	1140000

If there is no specific selection, the outline is generated automatically (rows **and** columns).

If specific lines are selected, the outline can be restricted to those lines.

### 2.2.2 Manual

- Select the lines or columns to group and that represent the lowest "level".
- Click on the lower section of the GROUP button (or drop-down list and option GROUP ...)

	A	B	C
1	<b>Depts and their managers</b>	<b>Geneva</b>	<b>Lausanne</b>
2	<b>Selling dpts : person in charge</b>		
3	Food	John Buck	Peter Sailers
4	<i>Daily fresh goods</i>	Amanda Tucky	Bill Smith
5	<i>Long keeping goods</i>	Jane Evelon	Edna Evans
6	Housing	Charles Robinon	Jack Payne

- Do the same for the other levels.
- ✎ If you select cells rather than rows, Excel will ask you whether the operation will affect rows or columns.  
It is not possible to select discontinuous rows or columns to group even if they belong to the same level. On the other hand, you may "repeat the last operation" (Ctrl + Y or F4) to go a bit faster.

## 2.3 Expanding or collapsing the outline levels



Expand to the required level by clicking on the corresponding number.



to expand the level

or button



to collapse the level

or button




## 2.4 Viewing or hiding the outline symbols

If the outline has many levels, the outline symbols can reduce significantly the working space. You may hide these symbols – without removing the outline.

- OFFICE Button – EXCEL OPTIONS Button – ADVANCED Category – DISPLAY OPTIONS FOR THIS WORKSHEET Topic –SHOW OUTLINE SYMBOLS IF AN OUTLINE IS APPLIED Option.

## 2.5 Ungrouping

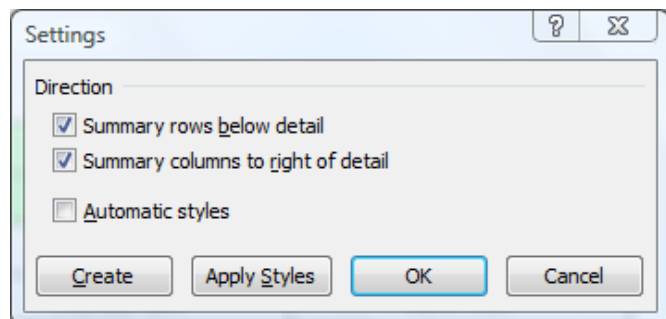
-  Make sure not to ungroup a collapsed level. The operation is done successfully but the lines or columns remain hidden.
- Select the line(s) or column(s) to ungroup.
- Click on the lower section of the UNGROUP button (or drop-down list and UNGROUP ...)

## 2.6 Removing the outline

- No selection is required but it is advisable to first fully expand the levels so that no row or column might remain hidden.
- Option CLEAR OUTLINE from the drop-down list of the UNGROUP button

## 2.7 The outline options

The dialog box launcher - OUTLINE Group :



### Automatic styles

Excel applies the preset cell styles RowLevel\_1, ColLevel\_1 (for instance italic) to all the summary rows or columns. Select the outline (fully expanded or not), activate this option and then click on the APPLY STYLES buttons.

You might find these cell styles a bit simple ... and no undo ...

### Summary rows ... Summary columns

If you activate these options, the *direction* is inverted, as shown in the following screen capture :

-	4	Sal	
.	5	Fix	
.	6	Val	
.	7	Tot	

### Create


To create an automatic outline

## 2.8 Collapsing outline levels and blocking the selection to the visible cells only

***Aim*** : hiding levels and selecting only the visible levels in order to copy and paste only the collapsed outline, apply a specific format or to create a chart from the outline.

- Show the required levels in the outline.
- Freeze the selection to those levels only (that is without showing their sub-levels).

*either* : HOME Tab – Drop-down list of the FIND & SELECT Button – GO TO SPECIAL Option –VISIBLE CELLS ONLY Option.

or by clicking on the  button (to add to the Quick Access toolbar)

- Then you can perform the required operation :

### **Apply a specific format**

**COPY-PASTE** : the paste will be automatically *values only*

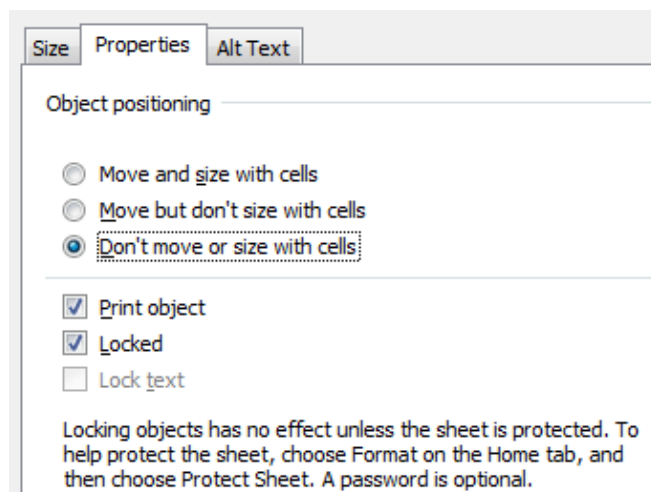
### **Chart**

#### Notes for charts :

*Although the selection has been frozen to the visible cells only, an embedded chart might become bigger when expanding outline levels. The reason for this is that there is a link between the objects and the underlying cells.*

*To free the chart :*

*Double-click on the chart border – FORMAT Tab – SIZE Group – Dialog box launcher - PROPERTIES Tab – Turn on : DON'T MOVE OR SIZE WITH CELLS.*



## 3 Custom views

### **Purpose**

Save the view mode, the printing settings etc.... without having to save them in separate sheets. *An example : your receive a file with a lot of hidden columns/lines. You unhide all of them and work on it but you should re-send the file in its original format.*


### 3.1 Creating a custom view

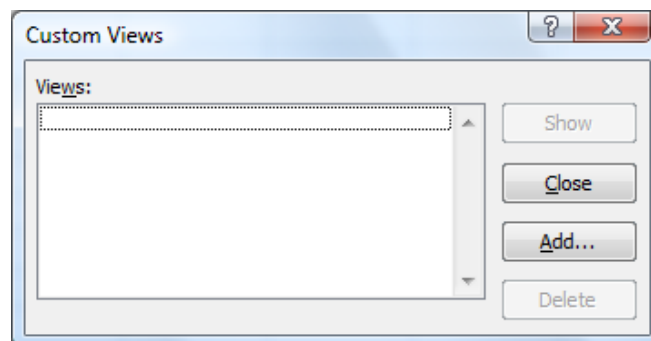
Prepare the required view, it can include

- ◆ The window size and position
- ◆ A screen splitting and/or frozen panes
- ◆ A specific active cell
- ◆ A zoom percentage
- ◆ A selected range of cells
- ◆ Hidden rows or columns
- ◆ An outline
- ◆ A filtered list
- ◆ A specific print area

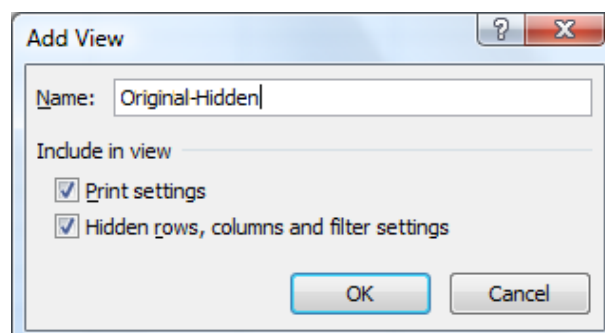
- ◆\* The file setup (orientation for example) cannot be included in a custom view.

VIEW Tab – WORKBOOK VIEWS Group – CUSTOM VIEWS Button  
(The box lists the created views).

 Advice : the current view should be made the *first* custom view, in order not to lose them when you create other views.



Click on the ADD button to create the view :



Do the same for the next views.

### 3.2 Viewing / deleting a custom view

- VIEW Tab – WORKBOOK VIEWS Group – CUSTOM VIEWS Button.
- Click on the view to show or to delete.
- SHOW or DELETE Button.

### 3.3 Printing a custom view

Show the view and print

## 4 Scenarios

### Purpose

Save every result of one or more formulas when some of their precedents are changed so that each "possibility" or scenario can be easily retrieved.

### 4.1 Creating a scenario

*Example : You need to borrow Frs. 200'000 at the rate of n% over n periods. Several offers are available. You would like to be able to consult, print each offer without having to create a separate sheet for each case.*

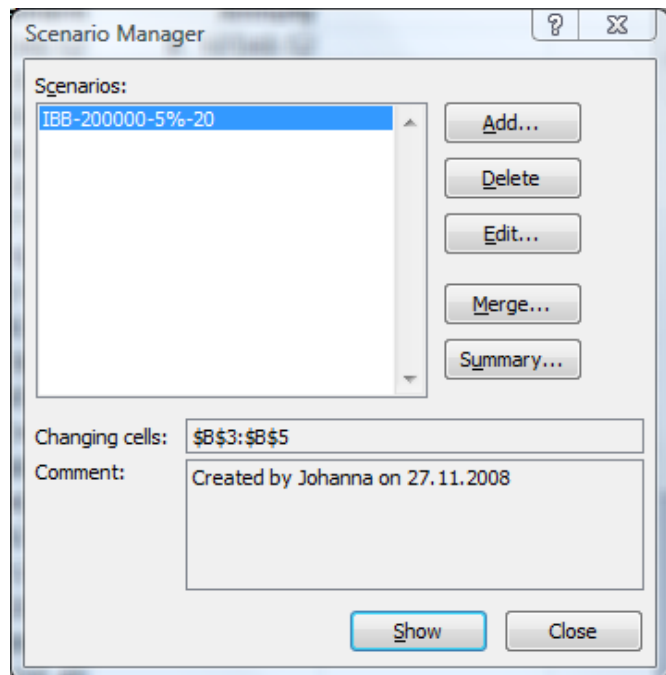
Here below the beginning of your sheet with the data :

	A	B	C	D	E
1	<b>IBB BANK (Geneva) SA</b>		<b>Exercise</b> Create more than one scenario - up to your choice Examples : - Same bank but rate 4.5% - Same bank but amount 300000 - Other bank and duration 25 years		
2					
3	<b>Amount</b>	<b>200'000</b>			
4	<b>Interest rate</b>	<b>5%</b>			
5	<b>Duration in years</b>	<b>20</b>			
6	<b>Annuity to pay</b>	<b>fr. 16'048.52</b>			
7					
8	<b>Re-imbusement schedule</b>				
9		<b>Year</b>	<b>Interest</b>	<b>Re-imbusement</b>	<b>Annuity</b>
10		1	fr. 10'000.00	fr. 6'048.52	fr. 16'048.52
11		2	fr. 9'697.57	fr. 6'350.94	
12		3	fr. 9'380.03	fr. 6'668.49	
13		4	fr. 9'046.60	fr. 7'001.91	
14		5	fr. 8'696.51	fr. 7'352.01	
15		6	fr. 8'328.91	fr. 7'719.61	
16		7	fr. 7'942.93	fr. 8'105.59	
17		8	fr. 7'537.65	fr. 8'510.87	
18		9	fr. 7'112.10	fr. 8'936.42	
19		10	fr. 6'665.28	fr. 9'383.24	
20		11	fr. 6'196.12	fr. 9'852.40	
21		12	fr. 5'703.50	fr. 10'345.02	
22		13	fr. 5'186.25	fr. 10'862.27	

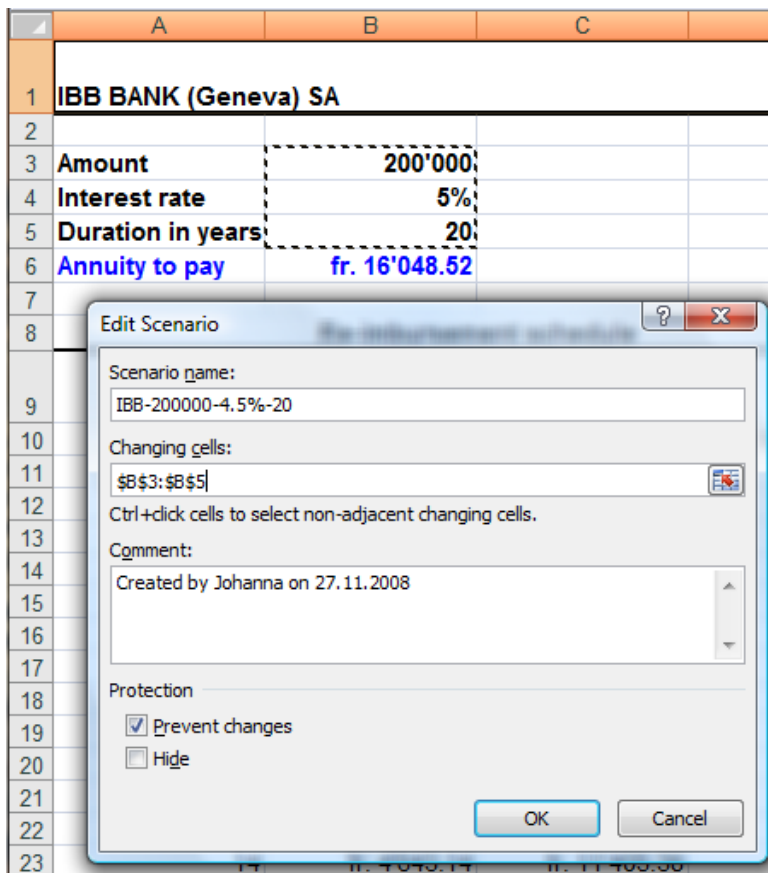
- DATA Tab – DATA TOOLS Group – Drop-down list of the WHAT-IF ANALYSIS Button – SCENARIO MANAGER Option

The box lists the already saved scenarios or indicates that no scenario has been yet saved.

Here the source values have been saved as the *first* scenario, in order not to lose them when creating the other scenarios. We strongly advise you to do the same.



- Click on the ADD button to save the next scenario:

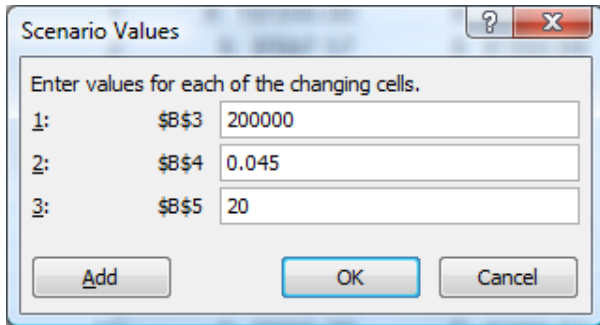


Changing cells : you can select cells containing text, only to make the scenario changes more easy to find and understand.

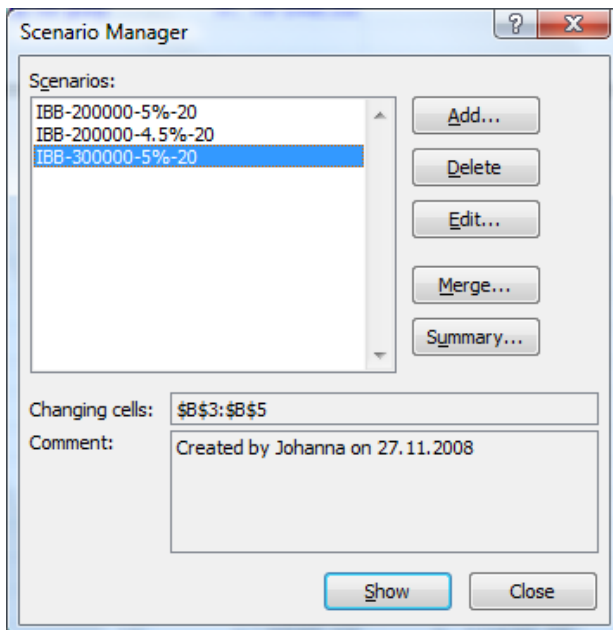
Hide : hides the name of the scenario when the sheet or the workbook is in active protection

If a selected cell contains a formula, Excel will inform you that when showing the scenario the formula will be replaced with a value.


- The next dialog box will let you set the values of the scenario :



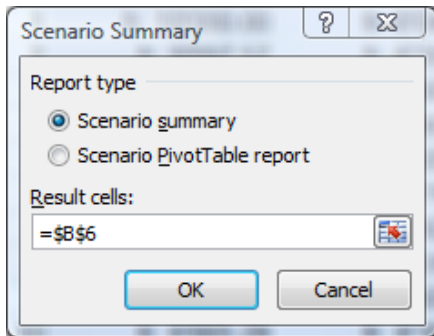
- Click on the OK button. The SCENARIO MANAGER dialog box indicates the saved scenarios and provides buttons to show, edit, delete .... any of them.



- Show** To show the selected scenario.
- Delete** To delete the selected scenario.
- Edit** To change the settings of the selected scenario.
- Merge** To import the scenarios from another sheet into the current one.
- Summary** A sheet will be created, displaying a report on the various scenarios (list of all changing cells, result cells).

 The summary is interesting because it shows in one table only the changing cells in the created scenarios and their result cells – that is the cells affected by the change of value. The result cells are freely chosen by the user.

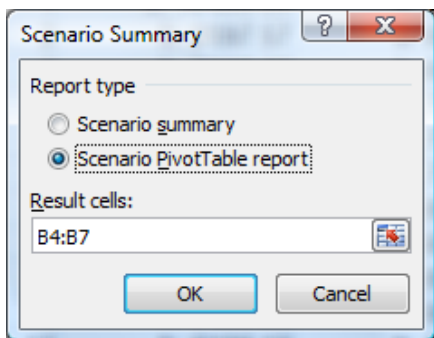
Here below an example : the summary for the result cell B6



		Scenario Summary			
		Current Values: IBB-200000-5%-20 IBB-200000-4.5%-20 IBB-300000-5%-20			
Changing Cells:					
\$B\$3	200'000	200'000	200'000	300'000	
\$B\$4	5%	5%	5%	5%	
\$B\$5	20	20	20	20	
Result Cells:					
\$B\$6	fr. 16'048.52	fr. 16'048.52	fr. 15'375.23	fr. 24'072.78	

Notes: Current Values column represents values of changing cells at time Scenario Summary Report was created. Changing cells for each scenario are highlighted in gray.

If the changing cells / result cells have been named, the name will be automatically retrieved and displayed instead of \$A\$2, which would make the report far easier to read and understand.




By scenario author	(All)			
Amount - Int - Years	Result Ce	Amount	Interest	Years
				Payment
IBB-200000-4.5%-20		200000	4.50%	20
IBB-200000-5%-20-Origin		200000	5.00%	20
IBB-200000-5%-25		200000	5.00%	25
IBB-200000-5.5%-20		200000	5.50%	20
IBB-250000-6%-20		200000	6.00%	20

The labels of the pivot table have been renamed, some formatting (number, percentage ...) has been applied to the table

## 4.2 Printing scenarios

Show the required scenario and print the worksheet.

To obtain a synoptic view of the scenarios, generate a summary report that you will print.

 The « Report manager » - until release 2002 – has been removed from the Office 2007 release

## 5 Single and double entry tables

An interest, a monthly reimbursement must be calculated for a loan. You wish to represent the various possibilities when the rate varies 5,5%, 6%, 6,5%, 7%..... and also when the amount varies 55'000, 60'000, 65'000, 70'000 ... A table showing every possibility can be created.

### 5.1 Single entry table

- Type the data (amount, rate ...).  
The cell containing the changing data will be called the *row input cell*. In the screen capture below it will be B4 ( 5%).

1			
2	<b>Loan</b>		
3	Amount borrowed	200000	
4	Rate	5%	
5	Duration	20 (years)	
6	A given year	1	
7			

- Type in line the formula(s) using the entry cell.  
(here first the fixed annuity(PMT), the part of interest (IPMT) and the part of reimbursement (PPMT)).

Left of formula(s) type in column the values that should vary and be substituted to that of the entry cell (here the changing rates).

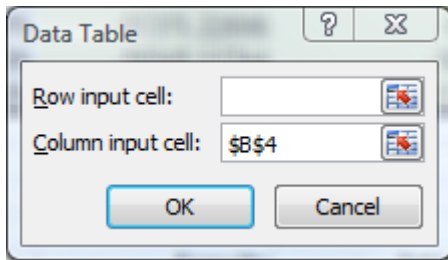
8		Annuity	Interests	Re-imbusement
9		PMT	IPMT	PPMT
10	Standard rate : 5%	SFr. -16'048.52	SFr. -10'000.00	SFr. -6'048.52
11	2%			
12	2.50%			
13	3%			
14	3.50%			
15	4%			
16	4.50%			
17	5%			
18	5.50%			
19				

Take a few minutes to format the results.

- Select the range of cells including the changing values and the formula(s) : DATA Tab – DATA TOOLS Group – Drop-down list of the WHAT-IF-ANALYSIS Button - DATA TABLE Option.

Under "Column Input Cell" indicate the entry cell.

You can click directly in the sheet or use the button located at the right of the box.



Result :

		Annuity	Interests	Re-imbusement
		PMT	IPMT	PPMT
10	Standard rate : 5%	SFr. -16'048.52	SFr. -10'000.00	SFr. -6'048.52
11	2%	-12231.34363	-4000	-8231.343625
12	2.50%	-12829.42575	-5000	-7829.425747
13	3%	-13443.14152	-6000	-7443.141519
14	3.50%	-14072.21536	-7000	-7072.215357
15	4%	-14716.35007	-8000	-6716.350066
16	4.50%	-15375.22886	-9000	-6375.228865
17	5%	-16048.51744	-10000	-6048.517438
18	5.50%	-16735.86601	-11000	-5735.866007

Apply a global format to make the table nice to read and understand.

You can create a table where the values to be substituted are typed in line.

**Modifications** : you can change any value, the table is automatically updated.

The result is called an array.

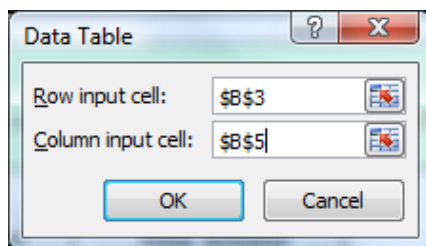
## 5.2 Double entry table

You proceed just as explained above.

Here below the table to create :

	A	B	C	D	E	F
2	<b>Loan</b>					
3	Rate	4.5%		PMT function - hidden under custom format ;;;		
4	Duration in years	20				
5	Amount	SFr. 350'000				
7		4.50%	5%	5.50%	6%	6.50%
8	SFr. 200'000	fr. -15'375.23	fr. -16'048.52	fr. -16'735.87	fr. -17'436.91	fr. -18'151.28
9	SFr. 250'000	fr. -19'219.04	fr. -20'060.65	fr. -20'919.83	fr. -21'796.14	fr. -22'689.10
10	SFr. 300'000	fr. -23'062.84	fr. -24'072.78	fr. -25'103.80	fr. -26'155.37	fr. -27'226.92
11	SFr. 350'000	fr. -26'906.65	fr. -28'084.91	fr. -29'287.77	fr. -30'514.59	fr. -31'764.74
12	SFr. 400'000	fr. -30'750.46	fr. -32'097.03	fr. -33'471.73	fr. -34'873.82	fr. -36'302.56
13	SFr. 450'000	fr. -34'594.26	fr. -36'109.16	fr. -37'655.70	fr. -39'233.05	fr. -40'840.38
14	SFr. 500'000	fr. -38'438.07	fr. -40'121.29	fr. -41'839.67	fr. -43'592.28	fr. -45'378.20
15	SFr. 550'000	fr. -42'281.88	fr. -44'133.42	fr. -46'023.63	fr. -47'951.51	fr. -49'916.02

- Type all the values that will be used in the formula.  
The cells containing the data that will vary (here the rate and the amount) are the two *input cells*.
- Type the formula using the above values.
- Under the formula and right of it, type the values to be substituted to those of the entry cells.  
If you wish to hide the result of the formula, you can use the customized number format [;;;].
- Select the range of cells including the wanted results but also the formula and the values to be substituted.
- DATA Tab – DATA TOOLS Group – Drop-down list of the WHAT-IF ANALYSIS Button – DATA TABLE Option.



Once again, apply the format of your choice to the table results.

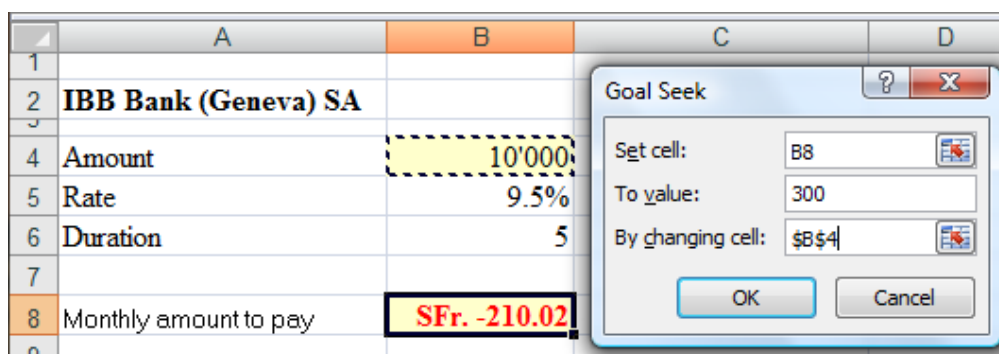
## 6 Goal seek and solver

### 6.1 Goal seek

This command allows you to find the result produced by a formula if you change only one of its precedents.

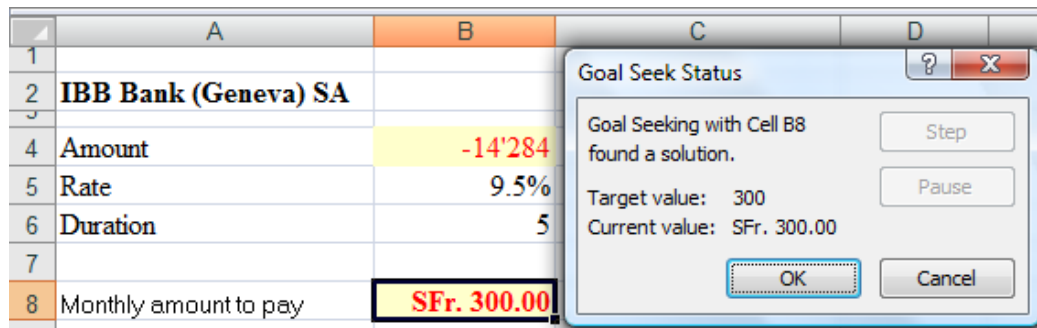
Example : you know how to use the PMT function and you have calculated the fixed annuity asked by a bank if you borrow a given sum (a small amount in Switzerland for a "crédit à la consommation", much bigger in France for a mortgage). The figure you first thought of produces a fixed annuity that does not correspond to your actual means (too high or too low). You can set the exact annuity you can afford and let the goal seek function find the corresponding amount.

- DATA Tab – DATA TOOLS Group – Drop-down list of the WHAT-IF ANALYSIS Button – GOAL SEEK Option



**Set cell**                    The cell containing the formula.  
**To value**                    Set the required value.  
**By changing cell**        Indicate the precedent to modify.

Excel does the calculation and tells you if a solution is found :



Click on OK and the solution found replaces the old values.

☛ If you want to keep you original, work on a copy !

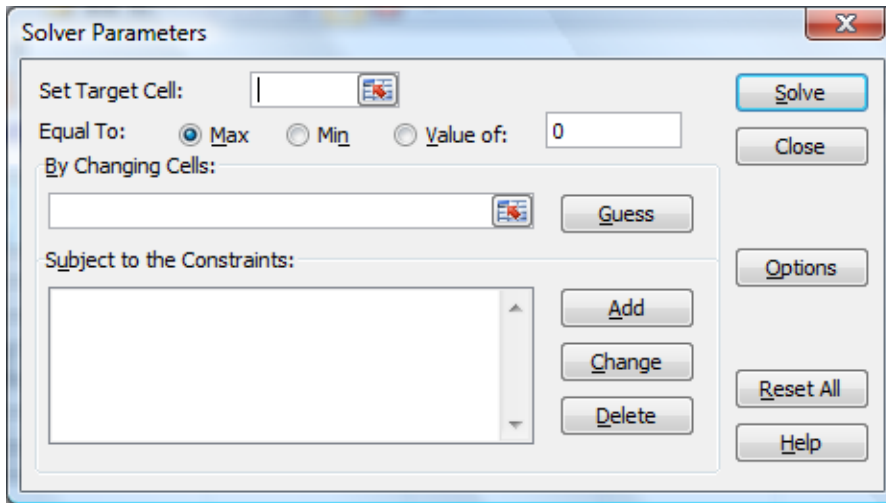
## 6.2 The solver

The case is similar but this time Excel needs to modify more than just one cell. Excel needs to work on various cells to work out the best solution to your problem. Moreover you can add constraints (for example Excel is not allowed to modify a given cell above a certain value).

In fact, the solver is mainly used for **optimizing complex mathematical equations** ! Here after a non mathematical example, just to explain how the solver works.

	A	B	C	D	E	F
1	<b>Tasty recipe for "petits pains au lait"</b>					
2						
3	<b>Product</b>	<b>Fat proportion per Kg</b>	<b>Basic recipe</b>	<b>Proportions for 10 Kg</b>	<b>Total fat in gm</b>	
4						
5	butter	800.00 gm	0.125 Kg	1.25 Kg	1'000.00 gm	
6	flour	4.00 gm	0.500 Kg	5.00 Kg	20.00 gm	
7	milch	27.00 gm	0.250 Kg	2.50 Kg	67.50 gm	
8	yeast	0.00 gm	0.015 Kg	0.15 Kg	0.00 gm	
9	egg	175.00 gm	0.060 Kg	0.60 Kg	105.00 gm	
10	sugar	0.00 gm	0.050 Kg	0.50 Kg	0.00 gm	
11	salt	0.00 gm	0.010 Kg	0.10 Kg	0.00 gm	
12						
13	<b>Total</b>			<b>10.10 Kg</b>	<b>1'192.50 gm</b>	
14						
15	<b>Exercise</b>					
16	The composition must be modified so that the total proportions are 10 Kg.					
17	But the fat total must be equal to 1000					
18						
19	The change of proportions must also respect the following constraints :					
20	Max values : butter <= 1.45 - flour <= 5.3 - milk <= 2.8 - yeast <= 0.18 - sugar <= 0.8 but salt = 0.10					
21	Min values : butter >= 1 - flour >= 4.7 - milk >= 2.2 - yeast >= 0.10 - sugar >= 0.2					
22						

- Select the target cell
- DATA Tab – ANALYSE Group – SOLVEUR Button



**Set Target Cell**

It can be a fixed value but also a maximum or minimum value (given the table formulas and other constraints)

**Guess Button**

Excel searches for variable cells. You can set your own. (Excel only selects cells containing constants).

**Options Button**

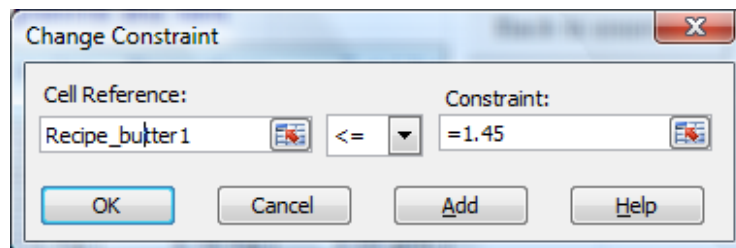
**Advanced** mathematical options.

**Constraints**

To add constraints on how Excel is allowed to modify given cells.

You can add 2 constraints by - *inferior and superior limits* + 100 additional constraints). The constraints can affect a cell or a range of cells, named or not, containing constants or formulas.

Example : inferior limit of price per unit fixed



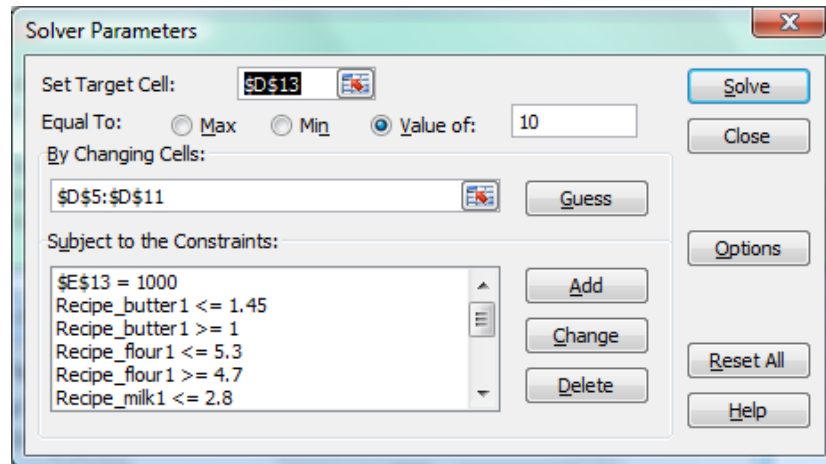
**Reset All Button**

Settings are all reset.

**Solve Button**

Run the solver

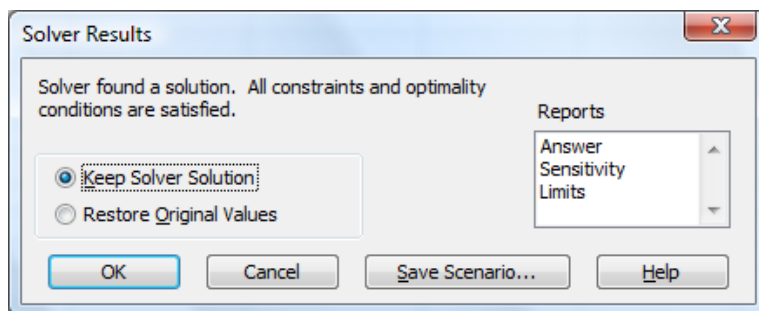
The solver in our example :



Click on SOLVE and here below the solver result for our recipe :

	A	B	C	D	E
1	<b>Tasty recipe for "petits pains au lait"</b>				
3	<b>Product</b>	<b>Fat proportion per Kg</b>	<b>Basic recipe</b>	<b>Proportions for 10 Kg</b>	<b>Total fat in grm</b>
5	butter	800.00 grm	0.125 Kg	1.00 Kg	802.77 grm
6	flour	4.00 grm	0.500 Kg	5.03 Kg	20.13 grm
7	milch	27.00 grm	0.250 Kg	2.53 Kg	68.33 grm
8	yeast	0.00 grm	0.015 Kg	0.18 Kg	0.00 grm
9	egg	175.00 grm	0.060 Kg	0.62 Kg	108.78 grm
10	sugar	0.00 grm	0.050 Kg	0.53 Kg	0.00 grm
11	salt	0.00 grm	0.010 Kg	0.10 Kg	0.00 grm
13	<b>Total</b>			<b>10.00 Kg</b>	<b>1'000.00 grm</b>

Without having to close the dialog box, the following options are possible :



**Keep Solver Solution** ☛ Excel replaces the original table with the new values. If you wish to keep the source table, work on a copy or use the next *Save Scenario* option.

**Save Scenario** To save the solution as a scenario that you will be able to retrieve whenever you want. Once the scenario is saved, the same box comes up again to allow you to apply the solution to the table or not.

*To retrieve the saved scenario : DATA Tab – DATA TOOLS Group – Drop-down list of the WHAT-IF-ANALYSIS Button –SCENARIO MANAGER Option.*

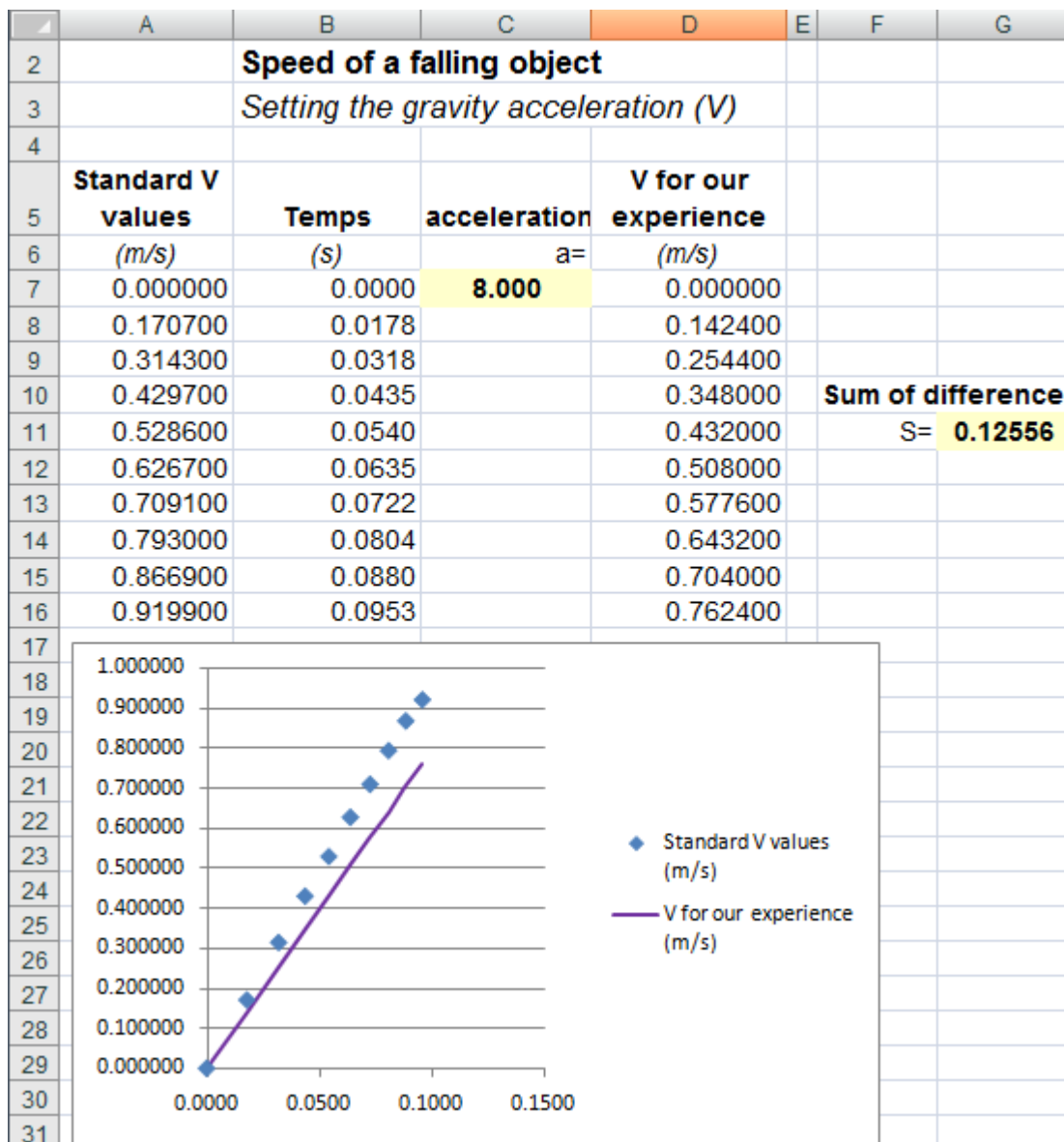
## Rapports

Various analysis reports. You can choose one or more if you hold down the CTRL key when clicking. They will help to show the relation between the initial values and the solver values, how narrow is the gap etc....

Here below an example of a « Answer » report :

	A	B	C	D	E	F	G
1	Microsoft Excel 12.0 Answer Report						
2	Worksheet: [XL-Projections.xlsm] Solver-Recipe-Result						
3	Report Created: 27.11.2008 15:03:53						
4							
5							
6	Target Cell (Value Of)						
7		<b>Cell</b>	<b>Name</b>	<b>Original Value</b>	<b>Final Value</b>		
8		\$D\$13	Total for 10 Kg	10.00 Kg	10.00 Kg		
9							
10							
11	Adjustable Cells						
12		<b>Cell</b>	<b>Name</b>	<b>Original Value</b>	<b>Final Value</b>		
13		\$D\$5	Recipe_butter1	1.00 Kg	1.00 Kg		
14		\$D\$6	Recipe_flour1	5.03 Kg	5.03 Kg		
15		\$D\$7	Recipe_milk1	2.53 Kg	2.53 Kg		
16		\$D\$8	Recipe_yeast1	0.18 Kg	0.18 Kg		
17		\$D\$9	Recipe_egg1	0.62 Kg	0.62 Kg		
18		\$D\$10	Recipe_sugar1	0.53 Kg	0.53 Kg		
19		\$D\$11	Recipe_salt1	0.10 Kg	0.10 Kg		
20							
21							
22	Constraints						
23		<b>Cell</b>	<b>Name</b>	<b>Cell Value</b>	<b>Formula</b>	<b>Status</b>	<b>Slack</b>
24		\$E\$13	Total in grm	1'000.00 grm	\$E\$13=1000	Not Binding	0
25		\$D\$6	Recipe_flour1	5.03 Kg	\$D\$6<=5.3	Not Binding	0.267958619
26		\$D\$5	Recipe_butter1	1.00 Kg	\$D\$5>=1	Not Binding	0.00 Kg
27		\$D\$5	Recipe_butter1	1.00 Kg	\$D\$5<=1.45	Not Binding	0.446539231
28		\$D\$6	Recipe_flour1	5.03 Kg	\$D\$6>=4.7	Not Binding	0.33 Kg
29		\$D\$7	Recipe_milk1	2.53 Kg	\$D\$7<=2.8	Not Binding	0.269366012
30		\$D\$7	Recipe_milk1	2.53 Kg	\$D\$7>=2.2	Not Binding	0.33 Kg
31		\$D\$8	Recipe_yeast1	0.18 Kg	\$D\$8<=0.18	Binding	0
32		\$D\$8	Recipe_yeast1	0.18 Kg	\$D\$8>=0.1	Not Binding	0.08 Kg
33		\$D\$10	Recipe_sugar1	0.53 Kg	\$D\$10<=0.8	Not Binding	0.267713855
34		\$D\$10	Recipe_sugar1	0.53 Kg	\$D\$10>=0.2	Not Binding	0.33 Kg
35		\$D\$11	Recipe_salt1	0.10 Kg	\$D\$11=0.1	Not Binding	0

Here below one mathematical example (the easiest I have been able to find on Internet ...):



Here below some explanations :

### Speed of a falling object

Setting the gravity acceleration (V)

$$v = a.t$$

Speed = acceleration \* falling speed

#### Elements :

A previous experience has already set the standard values (column A)

For this experience we shall multiply the falling speed by an **approximative acceleration value**

The result of our experience (**our V result**) is therefore found in column D

The problem : it is necessary to find an accurate acceleration value so that our final results will match the standard values

If we just "try" to set the acceleration to 8, 8.5, 9, 9.5 ..... the chart shows that we are off the standard values.

We need to use the SUMXMY2 function that will return the difference between the standard values and our values. This difference should be as near 0 as possible.

We use the solver to find the exact acceleration value that will produce a 0 gap  
This will ensure that our values are practically identical to the standard values.

Solver :

	A	B	C	D	E	F	G	H
1	<b>Speed of a falling object</b>							
2	Setting the gravity acceleration (V)							
3								
4	<b>Standard V values</b>	<b>Temps</b>	<b>acceleration</b>	<b>V for our experience</b>				
5	(m/s)	(s)	a=	(m/s)				
6	0.000000	0.0000	8.000	0.000000				
7	0.170700	0.0178		0.142400				
8	0.314300	0.0318		0.254400				
9	0.429700	0.0435		0.348000				
10	0.528600	0.0540		0.432000			<b>Sum of difference</b>	
11	0.626700	0.0635		0.508000			S=	<b>0.12556</b>

**Solver Parameters**

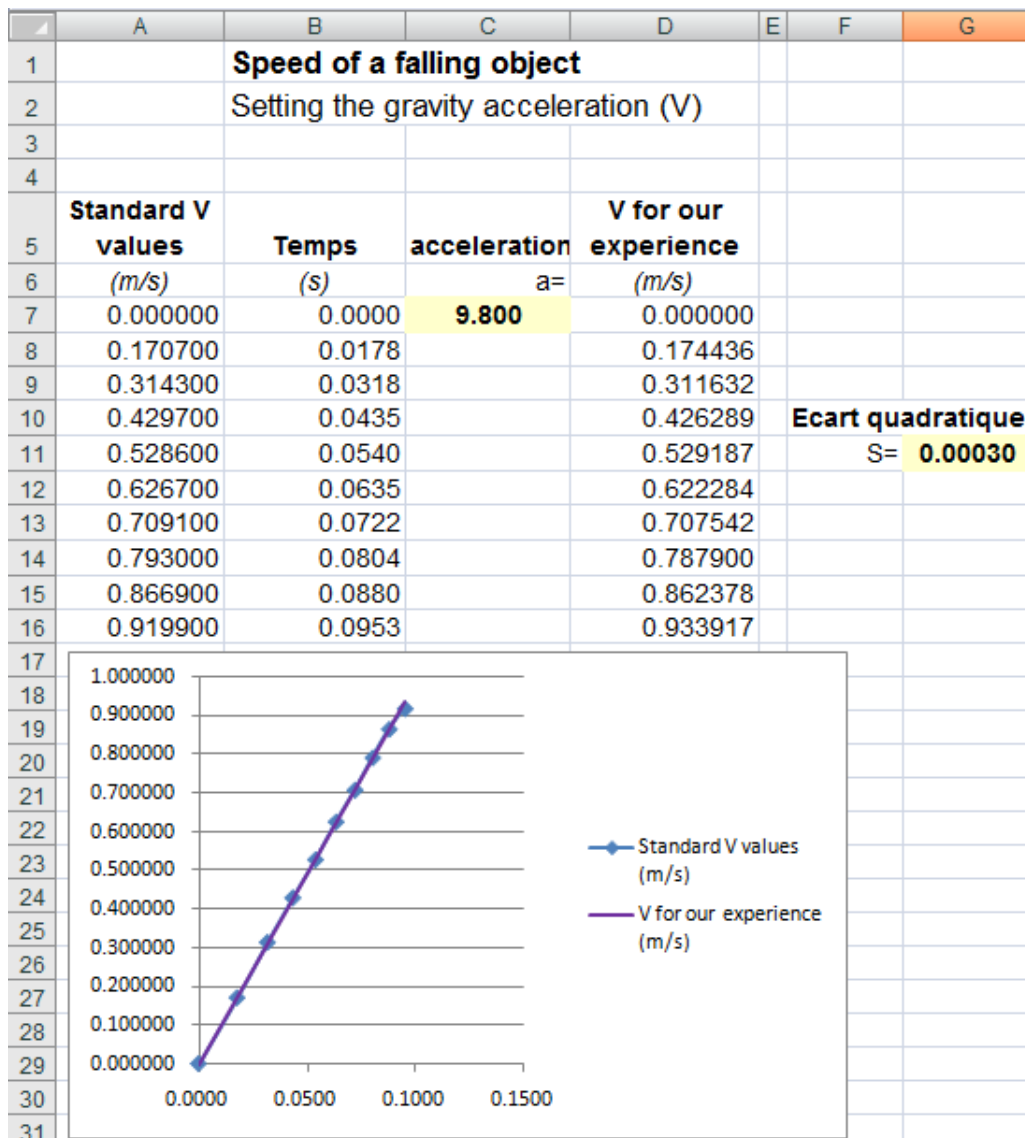
Set Target Cell:

Equal To:  Max  Min  Value of:

By Changing Cells:

Subject to the Constraints:

Result and corresponding chart :



**If the solver is not installed (from the Microsoft help file)**

- Click on the Office Button then on the Excel Options button.
- Click on Add-Ins, then in the Manage area, click on the Go button (check that you have selected Excel Add-ins)
- Select Solver Add-In
- Once the add-in has been uploaded, it will be displayed on the Data tab, in the Analyzis group.