Unit 2: Formulas, Chart and Data

Charts

Creating 2D and 3D Charts (Columns, Line, Pie, Bar, Scatter)

Charts and graphs can be powerful ways to convey information to the reader.OpenOffice.org Calc offers a variety of different chart and graph formats for your data.
Open the chart Wizard dialog using one of two methods.

- Choose Insert > Chart from the menu bar.
- Or click the chart icon on the main toolbar.

Figure 2.1: Insert chart from main toolbar

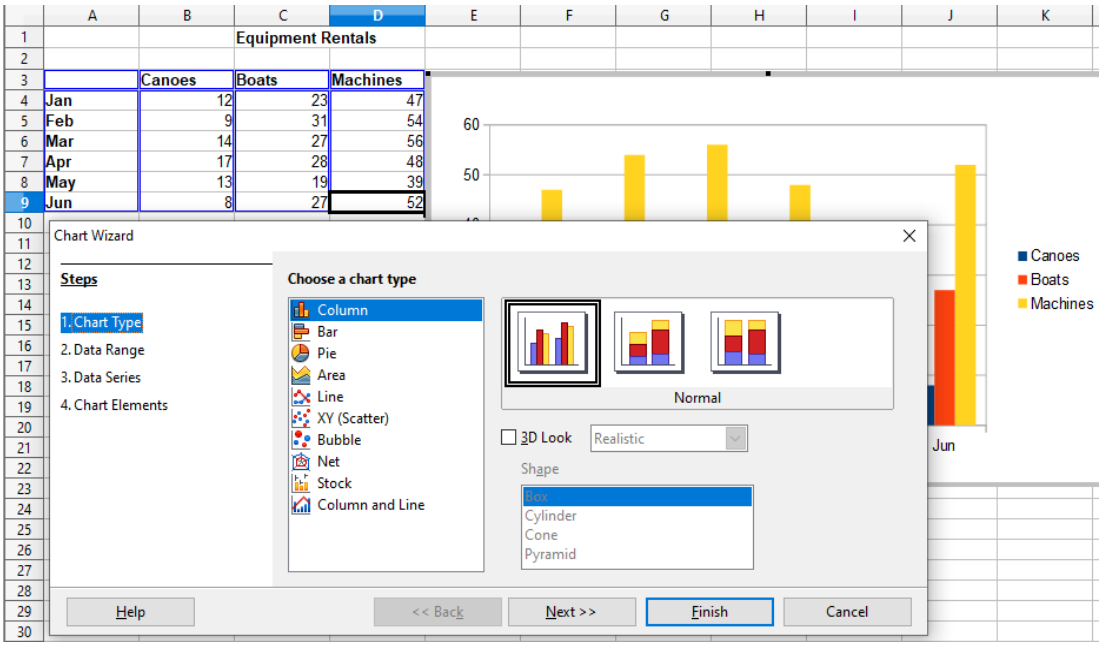
Either method inserts a sample chart on the worksheet, opens the Formatting toolbar, and opens the Chart Wizard, as shown in above figure.

Step 1 choosing a chart type

The Chart Wizard includes a sample chart with your data. The Chart Wizard has three main parts: a list of steps involved in setting up the chart, a list of chart types, and the options for each chart type. There are main 10 basic chart types which may be 2D or 3D.Select chart type and press next button.

The first tier of choice is for two-dimensional (2D) charts. Only those types which are suitable for 3D (Column, Bar, Pie, and Area) give you an option to select a 3D look.

Figure 2.2: Chart Wizard, Choose a chart type



Step 2 Changing data ranges and axes labels

You can select data range manually or wizard. You can choose data series plotting by rows or columns. You can choose whether to use the first row or first column, or both, as labels on the axes of the chart. You can confirm what you have done so far by clicking the Finish button, or click Next to change some more details of the chart.

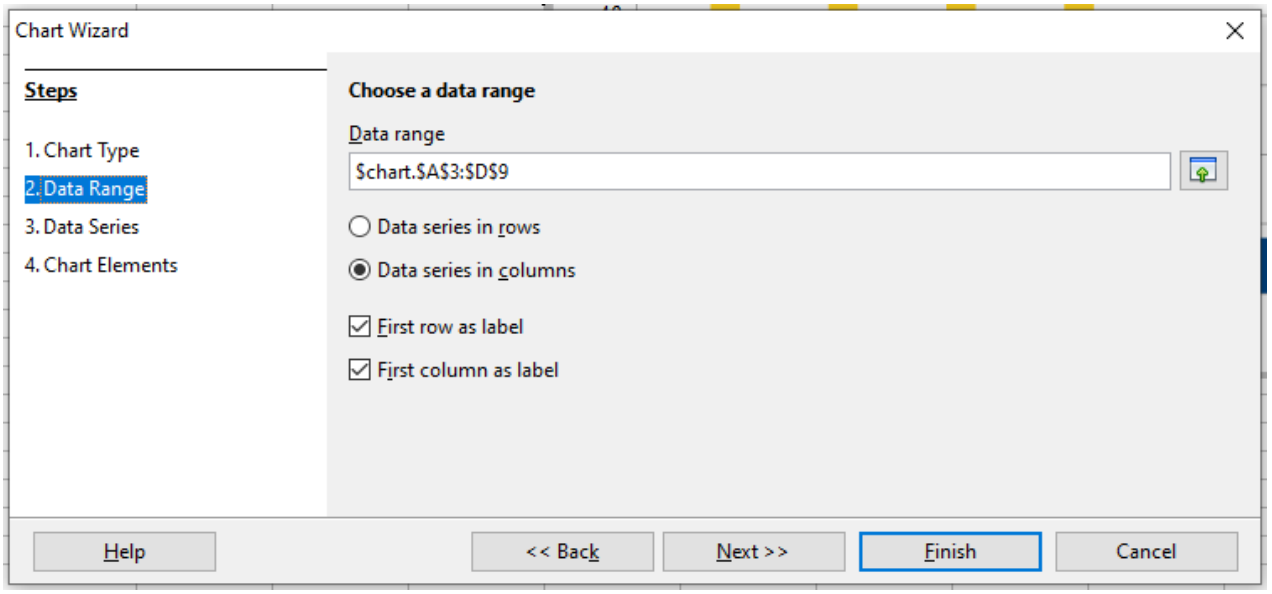


Figure 2.3: Changing data ranges and axes labels

Step 3 Selecting data series

On the Data series pages, you can select the data that you want to include in the chart. If you do not want any data just select and click on Remove.

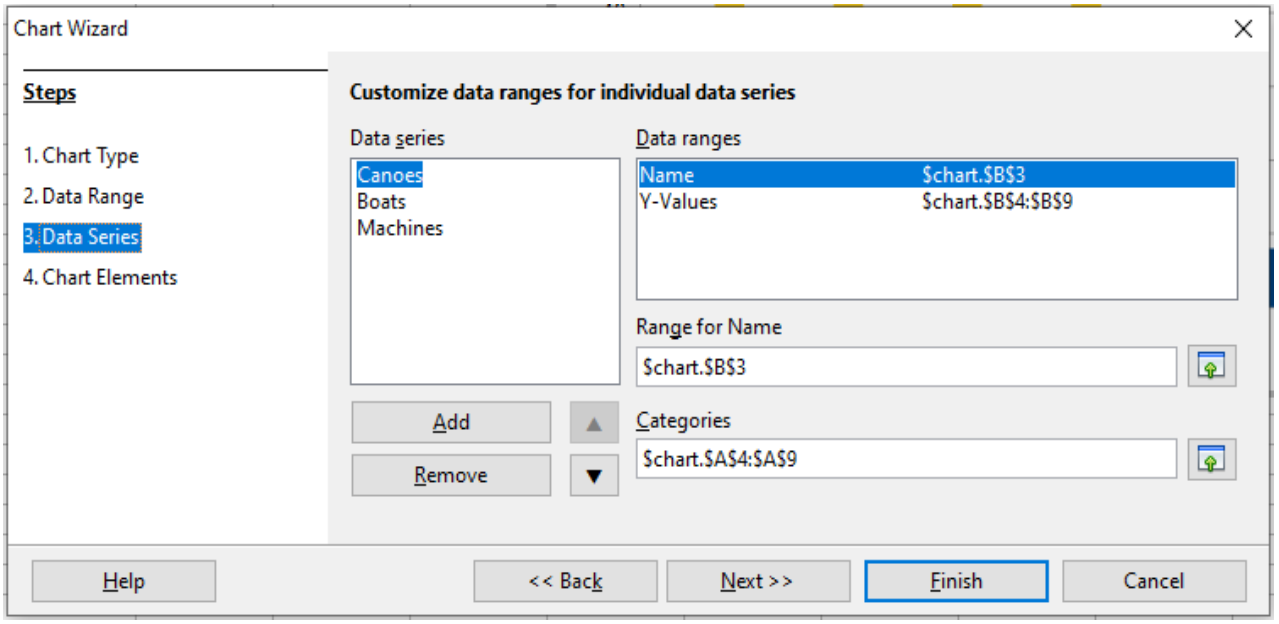
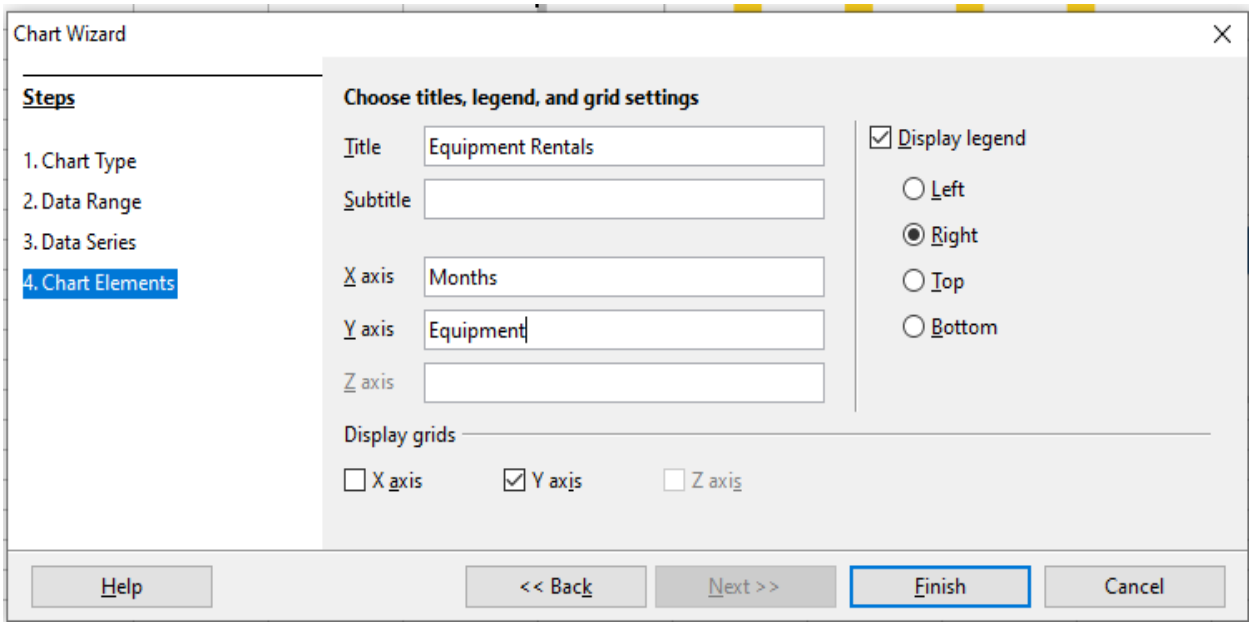


Figure 2.4: Amending data series and ranges

Step 4 Adding or changing titles, legend, and grids



On the Charts Elements page, you can give chart a title, subtitle, labels for the x axis or the y axis. You can leave out the legend or include it to the left, top or bottom. To confirm your selections and complete the chart, click Finish.

❖ **Adding or removing chart elements**

Below Figures show the elements of 2D and 3D charts. The default 2D chart includes only two of those elements:

- *Chart wall* contains the graphic of the chart displaying the data.
- *Chart area* is the area surrounding the chart graphic. The (optional) chart title and the legend (key) are in the chart area.
- The default 3D chart also has the *chart floor*, which is not available in 2D charts.

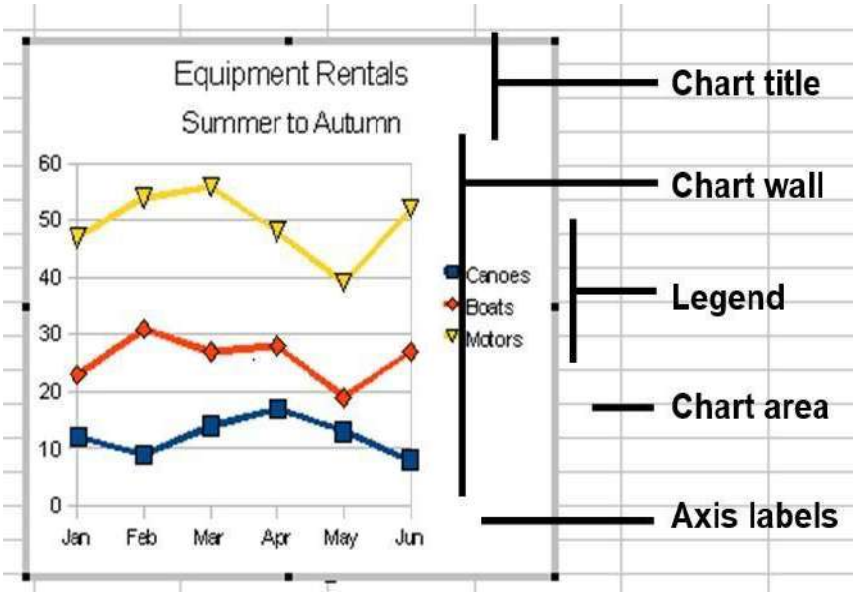


Figure 2.5: Elements of 2D chart

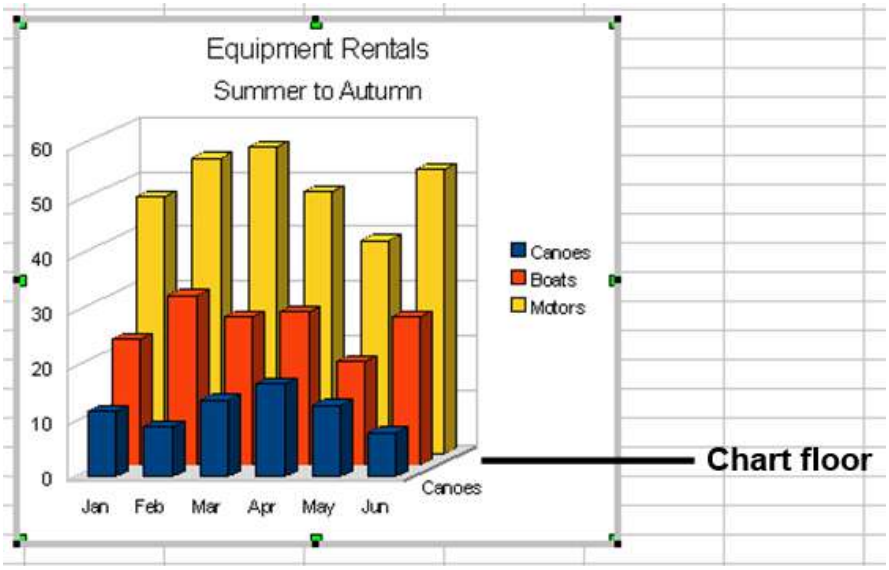


Figure 2.6: Elements of 3D chart

You can add other elements using the commands on the **Insert** menu. The various choices open dialogs in which you can specify details.

❖ Formatting 3D charts

Use **Format** > **3D View** to fine tune 3D charts. The 3D View dialog has three pages, where you can change the perspective of the chart, determine whether the chart uses the simple or realistic schemes or your own custom scheme, and the illumination that controls where the shadows will fall.

- **Rotation and perspective**
  To rotate a 3D chart or view it in perspective, enter the required values on the *Perspective* tab of the 3D View dialog.

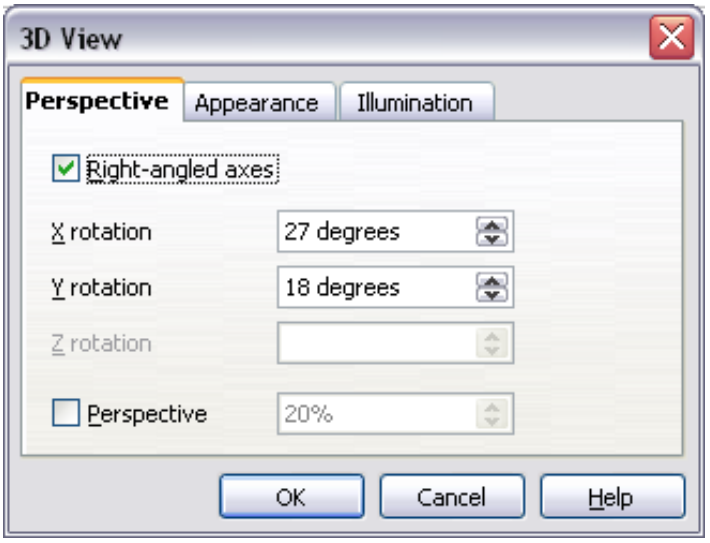


Figure 2.7: Rotating a chart

- **Appearance**
  Use the *Appearance* page to modify some aspects of a 3D chart‘s appearance.

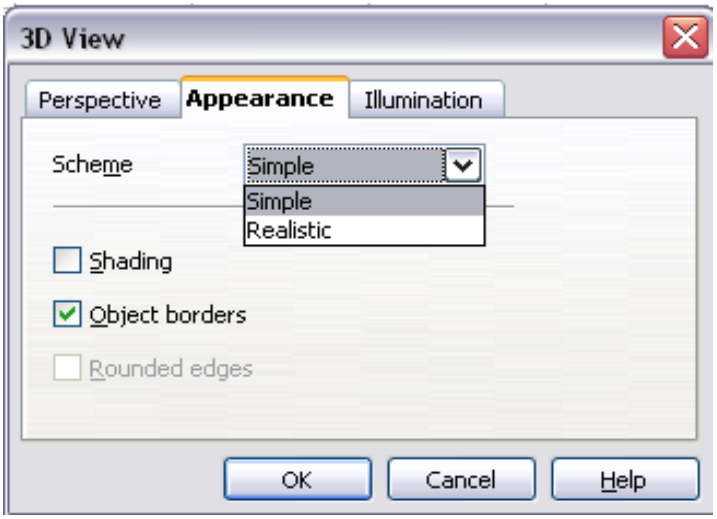


Figure 2.8: Modifying appearance of 3D chart

Select a scheme from the list box. When you select a scheme, the options and the light sources are set accordingly

Select **Shading** to use the Gouraud method for rendering the surface, which applies gradients for a smoother, more realistic look. Otherwise, a flat method is used. The flat method sets a single color and brightness for each polygon. The edges are visible, soft gradients and spot lights are not possible.

Select **Object Borders** to draw lines along the edges.

Select **Rounded Edges** to smooth the edges of box shapes. In some cases this option is not available.

- **Illumination**

Use the *Illumination* page to set the light sources for the 3D view. Click any of the eight buttons to switch a directed light source on or off. For the selected light source, you can then choose a color and intensity in the list just below the eight buttons. The brightness values of all lights are added, so use dark colors when you enable multiple lights.

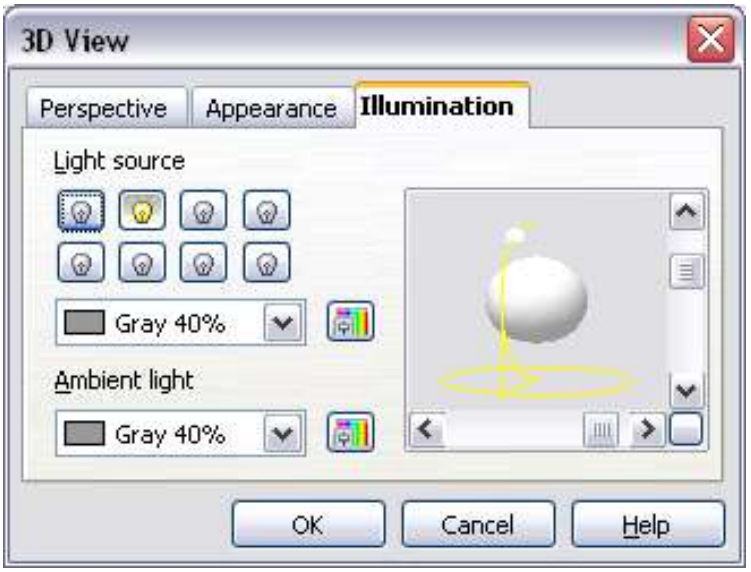
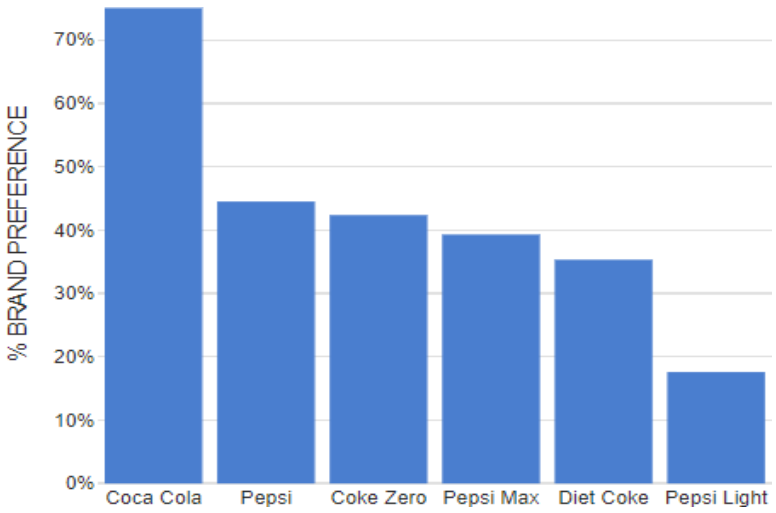


Figure 2.9: Setting the illumination

❖ **Column chart**

Column charts are commonly used for data that shows trends over time. They are best for charts that have a relatively small number of data points. It is the default chart type, as it is one of the most useful charts and the easiest to understand. A column chart is a data visualization where each category is represented by a rectangle, with the height of the rectangle being proportional to the values being plotted. Column charts are also known as vertical bar charts.
In the example below, the height of each bar is proportional to the percentage of people who listed each type of cola as being their favourite.



❖ **Line Chart:**

A *line chart* is a time series with a progression. It is ideal for raw data, and useful for charts with plentiful data that show trends or changes over time where you want to emphasize continuity. On line charts, the x-axis is ideal to represent time series data.

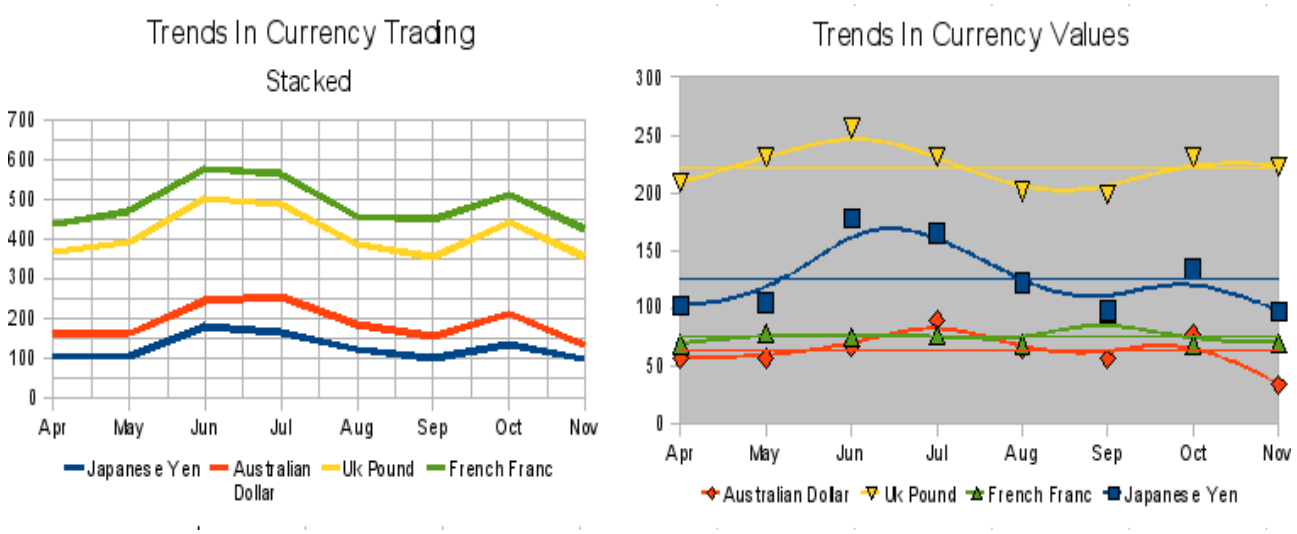


Figure 2.10: Line charts

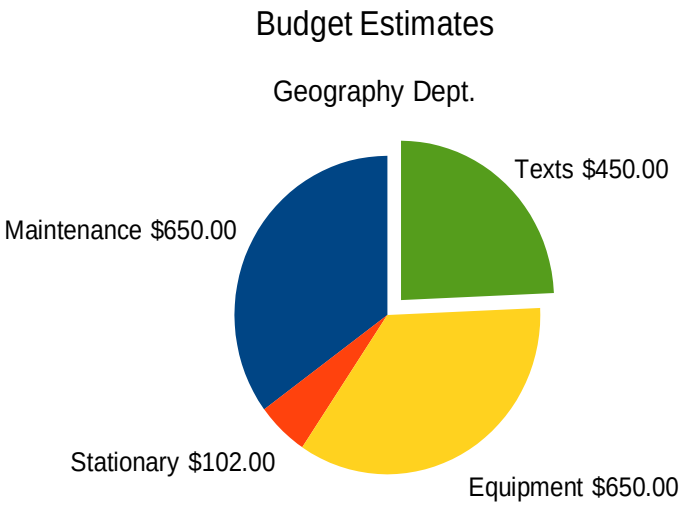
❖ **Pie Chart:**

Pie charts are excellent when you need to compare proportions. For example, a pie chart would be ideal if you needed to figure out comparisons of departmental spending, what the department spent on different items or what different departments spent. These charts work best with smaller numbers of values.

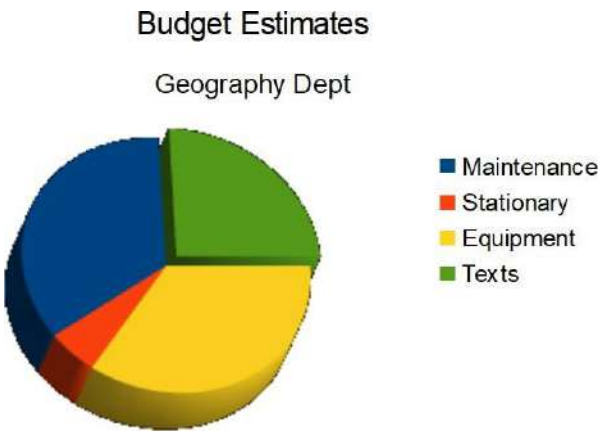
You can do some interesting things with a pie chart, especially if you make it into a 3D chart. It can then be tilted, given shadows, and generally turned into a work of art.

The effects achieved in Figure are explained below.

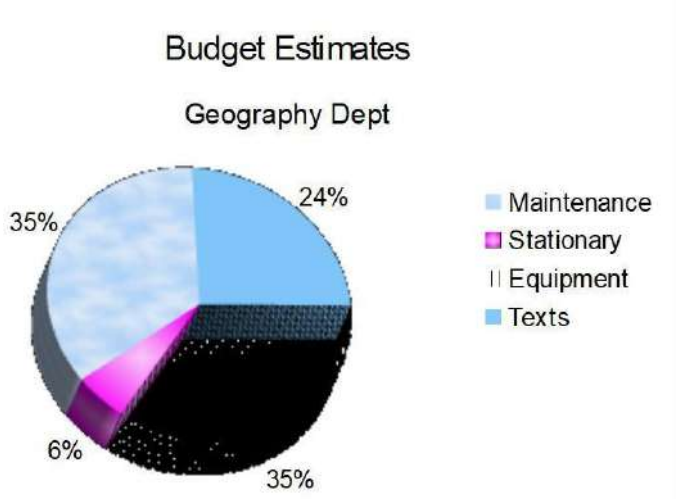
- The first example is a 2D pie chart with one part of the pie exploded. To produce this type of chart, first choose **Insert > Legend** and deselect **Display legend**. Choose **Insert > Data Labels** and choose **Show value as number**. Then carefully select the piece you wish to highlight, move the cursor to the edge of the piece and click (the piece will have nine green highlight squares to mark it), and then dragit out from the rest of the pieces.



- The second example is a 3D pie chart with realistic schema and illumination. With a completed 2D pie chart, choose **Format > 3D view > Illumination** where you can change the direction of the light, the color of the ambient light, and the depth of the shade. We also adjusted the 3D angle of the disc in the *Perspective* dialog on the same set of tabs.



- The third example is a 3D pie chart with different fill effects in each portion ofthe pie. Choose **Insert > Data labels** and select **Show value as percentage**. Carefully select each of the pieces so that it has a wire frame, then highlight and right-click to get the object properties dialog. Choose the *Area* tab. For one of the pieces we chose a bitmap effect, for another we selected a gradient feature and for the third we used the *Transparency* tab.



❖ **Bar Chart:**

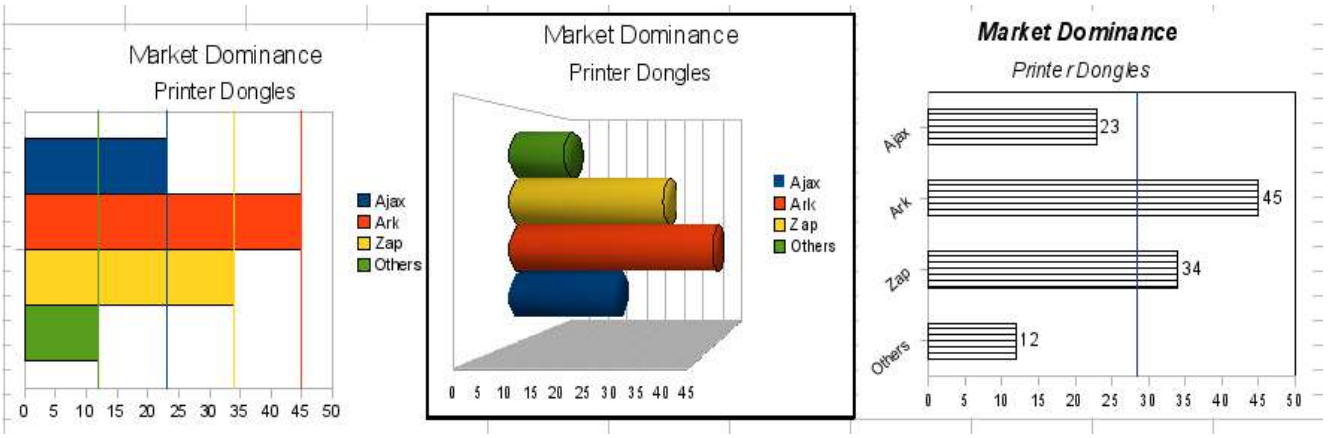


Figure 2.11: Three bar graph treatments.

Bar charts are excellent for giving an immediate visual impact for data comparison in cases when time is not an important factor, for example when comparing the popularity of a few products in a marketplace.

- The first chart in above Figure is achieved quite simply by using the chart wizard with **Insert > Grid**s, deselecting y-axis, and using **Insert > Mean Value Lines.**
- The second chart in the figure is the 3D option in the chart wizard witha simple border and the 3D chart area twisted around.
- The third chart in the figure is an attempt to get rid of the legend andput labels showing the names of the companies on the axis instead. We also changed the colors to a hatch pattern.

❖ **Scatter or XY charts**

Scatter charts are great for visualizing data that you have not had time to analyze, and they may be the best for data when you have a constant value against which to compare other data.

Examples of good scatter charts might include weather data, reactions under different acidity levels, conditions at altitude or any data which matches two series of numeric data. In contrast to line charts, the x-axis is to the left of the right labels, which usually indicates a time series.

Scatter charts may surprise those unfamiliar with how they work. While constructing the chart,

If you choose **Data Range > Data series in rows**, the first row of data represents the x-axis. The rest of the rows of data are then compared against the first row data. Figure 90 shows a comparison of three currencies with the Japanese Yen.

Even though the table presents the monthly series, the chart does not. In fact the Japanese Yen does not appear; it is merely used as the constant series that all the other data series are compared against.

	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov
Japanese Yen	102	105	178	165	122	98	134	97
Australian Dollar	56	57	67	90	64	56	78	34
Uk Pound	209	230	256	231	201	199	230	223
French Franc	69	78	75	76	69	95	69	70

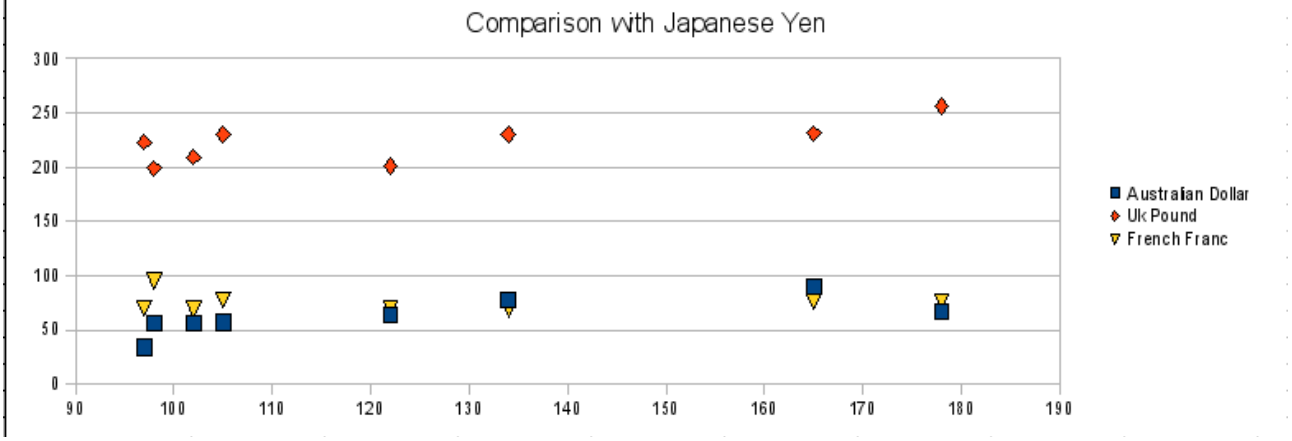


Figure 2.12: A particularly volatile time in the world currency market.

Difference among columns, Line and Bar Charts.

Bar Chart	Column Chart	Line Chart
Bar Chart use horizontal bars to display data and are used to compare values across categories.The lengths of the bars are proportional to the values they represent.	A simple column chart uses vertical bars to display data. The lengths of the bars are proportional to the values theyrepresent.	Line graphs (also called a *line chart* or *run chart*) can include a single line for one data set, or multiple lines to compare two or more sets of data.
Bar charts are used to compare values across categories and can be used to show change over a period of time.	Column charts are used to compare values across categories and can be used to show change over a period of time.	It is ideal for raw data, and useful for charts with plentiful data that show trends or changes overtime.
For a bar chart the Y axis typically displays a category. While the X axis displays a discrete value.	In a column chart the Y axis typically displays a discrete value whilst the X axis displaysthe category.	On a line graph, the X axisis the independent variable and generally shows time periods. Y axis is the dependent variable and shows the data you are tracking.
Bar graphs are an extremely effective visual to use in presentations and reports. They are popular because they allow the reader to recognize patterns or trends far more easily than looking at a table of numerical data.	Column charts are ideal if you need to compare a single category of data between individual sub-items, such as, for example, when comparing revenue between regions, Showing average scores ranked by subjects to show which subject students are weak in.	Line charts should be used only for time series (chronological) or when there is some other sequence to the dimensions on the x-axis, e.g. dates, months, sequence of stages of a project, sequence of meters along on a gaspipeline.

Mathematical functions

SUM

Sums the contents of cells.

Syntax:

SUM(number1; number2; ... number30)

number1 to **number30** are up to 30 numbers or ranges/arrays of numbers whose sum is to be calculated.

SUM ignores any text or empty cell within a range or array.

Example:

SUM(2; 3; 4)

returns **9**, because **2**+**3**+**4** = **9**.

SUM(B1:B3)

(where cells **B1**, **B2**, **B3** contain **1.1**, **2.2**, **3.3**) returns **6.6**.

Statistical functions

AVERAGE

Returns the average of the arguments, ignoring text.

Syntax:

AVERAGE(number1; number2; ... number30)

number1 to **number30** are up to 30 numbers or ranges containing numbers.

Example:

AVERAGE(2; 6; 4)

returns **4**, the average of the three numbers in the list.

AVERAGE(B1:B3)

where cells **B1**, **B2**, **B3** contain **1**, **3**, and **apple** returns **2**, the average of **1** and **3**. Text is ignored.

COUNT

Counts the numbers in the list of arguments, ignoring text entries.

Syntax:

COUNT(value1; value2; ... value30)

value1 to **value30** are up to 30 values or ranges representing the values to be counted.

Examples:

COUNT(2; 4; 6; "eight")

returns **3**, because **2**, **4** and **6** are numbers (**"eight"** is text).

COUNT(B1:B3)

where cells **B1**, **B2**, **B3** contain **1.1**, **2.2**, and **apple** .It returns **2**.

COUNT(B1:B3)

where cells **B1**, **B2**, **B3** are empty, returns **0**.

MAX

Returns the maximum of a list of arguments, ignoring text entries.

Syntax:

MAX(number1; number2; ... number30)

number1 to **number30** are up to 30 numbers or ranges containing numbers.

Example:

MAX(2; 6; 4)

returns **6**, the largest value in the list.

MAX(B1:B3)

where cells **B1**, **B2**, **B3** contain **1.1**, **2.2**, and **apple** returns **2.2**.

MIN

Returns the minimum of a list of arguments, ignoring text entries.

Syntax:

MIN(number1; number2; ... number30)

number1 to **number30** are up to 30 numbers or ranges containing numbers.

Example:

MIN(2; 6; 4)

returns **2**, the smallest value in the list.

MIN(B1:B3)

where cells **B1**, **B2**, **B3** contain **1.1**, **2.2**, and **apple** returns **1.1**.

Mathematical functions

SUMIF

Conditionally sums the contents of cells in a range.

Syntax:

SUMIF(test_range; condition; sum_range)

This function identifies those cells in the range **test_range** that meet the **condition**, and sums the corresponding cells in the range **sum_range**. If **sum_range** is omitted the cells in **test_range** are summed.

condition may be:

a number, such as **34.5**

an expression, such as **2/3** or **SQRT(B5)**

a text string

SUMIF looks for cells in **test_range** that are equal to **condition**, unless **condition** is a text string that starts with a comparator:

>, <, >=, <=, =, <>

In this case **SUMIF** compares those cells in **test_range** with the remainder of the text string (interpreted as a number if possible or text otherwise).

For example the condition **–>4.5‖** tests if the content of each cell is greater than the number 4.5, and the condition **–<dog‖** tests if the content of each cell would come alphabetically before the text **dog**.

Blank (empty) cells in **test_range** are ignored (they never satisfy the condition).

condition can only specify one single condition.

Example:

SUMIF(A1:A9;"<0")

returns the sum of the negative numbers in **A1:A9**.

SUMIF(A1:A9; F1)

where **F1** contains the text **>=0** (without double quotes) returns the sum of the positive numbers in **A1:A9**.

SUMIF(B2:B4; "<"&F2; C2:C4)

where **F2** contains **10** and cells **B2**, **B3**, **B4** contain **7**, **9**, **11**, returns the sum of **C2** and **C3**, because cells **B2** and **B3** are less than **10**.

SUMIF(D1:D9; "apples"; E1:E9)

where cells in **D1:D9** contain either **apples** or **pears** and cells in **E1:E9** contain the corresponding quantities of each fruit, returns the total quantity of **apples**.

Statistical functions

STDEV

Returns the sample standard deviation of the arguments.

Syntax:

STDEV(number1; number2; ... number30)

number1 to **number30** are up to 30 numbers or ranges containing numbers.

STDEV returns the standard deviation where **number1** to **number30** are a **sample** of the entire population. With *N* values in the sample, the calculation formula is:

$$\sqrt{\frac{1}{N-1}\sum_{i=1}^{N}(x_i-\bar{x})^2}$$

.

Example:

STDEV(2; 6; 4)

returns **2**.

Note:

In statistics, the standard deviation is a measure of the amount of variation or dispersion of a set of values. A low standard deviation indicates that the values tend to be close to the mean (also called the expected value) of the set, while a high standard deviation indicates that the values are spread out over a wider range.

It is the **square root** of the **Variance.**

The Variance is defined as:

The average of the squared differences from the Mean.

Financial functions

PMT

Returns the payment per period for a fixed rate loan.

Syntax:

PMT(rate; numperiods; principal; finalbalance; type)

rate: the interest rate per period.

numperiods: the total number of payment periods in the term. nper-number of periods

principal: the initial sum borrowed.PV-PRESENT VALUE

finalbalance: the cash balance you wish to attain at the end of the term (optional - defaults to 0). With a loan, this would normally be 0.

type: when payments are made (optional - defaults to 0):

0 - at the end of each period.

1 - at the start of each period (including a payment at the start of the term).

See the examples for how this function can be used for building up savings with fixed regular payments.

Example:

PMT(5.5%/12; 12*2; 5000; 0; 0)

returns -220.48 in currency units. You take out a 2 year loan of 5000 currency units at a yearly interest rate of 5.5%, making monthly payments at the end of the month. You pay 220.48 currency units each month; it is given as negative because you pay it.

PMT(5%/12; 12*2; 0; 1000; 1)

returns -39.54 in currency units. You wish to save 1000 currency units over 2 years, making monthly payments, beginning today. You assume the rate will remain the same at 5%. Interest is compounded monthly. If you save 39.54 currency units each month, the value at the end of 2 years will be 1000 currency units.

PMT(5.5%/12; 12*2; 5000; 1000; 0)

returns -259.99 in currency units. You take out a 2 year loan of 5000 currency units at a yearly interest rate of 5.5%, making monthly payments at the end of the month. You wish to build up a lump sum of 1000 currency units, to be paid to you at the end of the term. Interest is compounded monthly.

List of Calc Logical functions

The logical functions operate on logical ('boolean') values, that is, **TRUE** or **FALSE**.

AND returns **TRUE** if all the arguments are **TRUE**.

FALSE returns the logical value **FALSE**.

IF returns one of two values, depending on a test condition.

NOT returns **TRUE** if the argument is **FALSE**, and **FALSE** if the argument is **TRUE**.

OR returns **TRUE** if any of the arguments are **TRUE**.

TRUE returns the logical value **TRUE**.

IF

Returns one of two values, depending on a test condition.

Syntax:

IF(test; value1; value2)

where:

test is or refers to a logical value or expression that returns a logical value (**TRUE** or **FALSE**).

value1 is the value that is returned by the function if **test** yields **TRUE.**

value2 is the value that is returned by the function if **test** yields **FALSE**.

If **value2** is omitted it is assumed to be **FALSE**; if **value1** is also omitted it is assumed to be **TRUE**.

Example:

IF(A1>5; 100; "too small")

returns the number 100 if A1 is greater than 5, and the text "too small" otherwise.

IF(1>2; "nonsense")

returns **FALSE** - because **value2** has been omitted and 1 is not greater than 2.

IF(2>1)

returns **TRUE** - because both **value1** and **value2** have been omitted and 2 is more than 1.

IF(1=2; 1/0; SQRT(4))

returns **2**, the square root of **4**. **IF()** only calculates the value chosen - in this case **1/0** would give a #DIV/0! error, but is not calculated.

AND

Returns **TRUE** if all the arguments are considered **TRUE**, and **FALSE** otherwise.

Syntax:

AND(argument1; argument2 ...argument30)

argument1 to **argument30** are up to 30 arguments, each of which may be a logical result or value, or a reference to a cell or range.

AND tests every value (as an argument, or in each referenced cell), and returns **TRUE** if they are all **TRUE**. Any value which is a **non-zero number** or **text** is considered to be **TRUE**.

Example:

If cells A5:B8 all contain **TRUE**, cell C2 contains **=TRUE()** and cell C3 contains "**dog**":

AND(2<4;A5:B8;C2)

returns **TRUE**.

AND(2<4;FALSE)

returns **FALSE**.

AND(C2:C3))

returns **TRUE**.

OR

Returns **TRUE** if any of the arguments are considered **TRUE**, and **FALSE** otherwise.

Syntax:

OR(argument1; argument2 ...argument30)

argument1 to **argument30** are up to 30 arguments, each of which may be a logical result or value, or a reference to a cell or range.

OR tests every value (as an argument, or in a each referenced cell), and returns **TRUE** if any of them are **TRUE**. Any **non-zero number** is considered to be **TRUE**. Any **text** cells in ranges are ignored.

Example:

OR(TRUE; FALSE)

returns **TRUE**.

OR(0; 5)

returns **TRUE**, because 5 is considered **TRUE**.

If cells A5:B8 all contain **FALSE**, and cell C2 contains **=TRUE()**:

OR(1>2; A5:B8; C2)

returns **TRUE**, because cell C2 is **TRUE**.

NOT

Reverses the logical value. Returns **TRUE** if the argument is **FALSE**, and **FALSE** if the argument is **TRUE**.

Syntax:

NOT(logical_value)

where **logical_value** is the logical value to be reversed.

Example:

NOT(TRUE())

returns **FALSE**

Issues:

- Entering **=NOT(TRUE)** in a cell correctly returns **FALSE**, but the display in the formula bar is **=NOT(1)**.

TRUE

Returns the logical value **TRUE**.

Syntax:

TRUE()

The **TRUE()** function has no arguments, and always returns the logical value **TRUE**.

Example:

TRUE()

returns **TRUE**

NOT(TRUE())

returns **FALSE**

FALSE

Returns the logical value **FALSE**.

Syntax:

FALSE()

The **FALSE()** function has no arguments, and always returns the logical value **FALSE**.

Example:

FALSE()

returns **FALSE**

NOT(FALSE())

returns **TRUE**

Date and Day function

DATE

Returns the date, expressed as a date-time serial number.

Syntax:

DATE(year ;month ;day)

year is an integer between 1583 and 9956 or between 0 and 99;month and day are integers.

If month and day are not within range for a valid date, the date will ‗roll over'.

Example:

DATE(2007;11;9)

returns the date 9th November 2007(as a date-time serial number).

DATE(2007;12;32)

returns 1st January 2008,the date rolls over, as 32nd December 2007 is not valid.

DATE(2004;3;0)

returns 29th February 2004,the date rolls over backwords, as 0th March 2004 is not valid,2004 was a leap year.

DATE(2006;15;8)

returns 8th March 2007,the date rolls over,as there are only 12 months in a year

Day

returns the day of date as a number(1-31).

Syntax:

Day(date)

Date may be text or a date-time serial number.

Example:

Day(―2008-06-04‖)

returns 4.

TIME

returns the time, given hours, minutes and seconds.

Syntax:

TIME(hours; minutes; seconds)

returns the time, expressed as a date-time serial number.

hours, **minutes** and **seconds** are integers.

If **hours**, **minutes** and **seconds** are not within range for a valid time, the time will 'roll over', as shown below.

Example:

TIME(9; 31; 20)

returns the time 9:31:20 am (as a date-time serial number).

TIME(9; 31; 75)

returns 9:32:15 am - the time rolls over, as there are only 60 seconds in a minute.

NOW

Returns the current date and time

Syntax:

NOW()

Returns the current date and time (as a date-time serial number). **NOW** is updated at every recalculation, for instance if a cell is modified.

Example:

NOW()

when calculated at say 12 noon on 1Apr08 returns that date and time.

HOUR

Returns the hour of a given time.

Syntax:

HOUR(time)

returns the hour of **time** as a number, **0 - 23**.

time may be text or a date-time serial number.

Example:

HOUR("2008-01-06 21:30:15")

returns **21**.

HOUR(A1)

where cell A1 contains the time **9:25:10** as a date-time serial number, returns **9**.

MINUTE

Returns the minutes of a given time.

Syntax:

MINUTE(time)

returns the minutes of **time** as a number, **0 - 59**.

time may be text or a date-time serial number.

Example:

MINUTE("2008-01-06 21:30:15")

returns **30**.

MINUTE(A1)

where cell A1 contains the time **9:25:10** as a date-time serial number, returns **25**.

SECOND

Returns the seconds of a given time.

Syntax:

SECOND(time)

returns the seconds of **time** as a number, **0 - 59**.

time may be text or a date-time serial number.

Example:

SECOND("2008-01-06 21:30:15")

returns **15**.

SECOND(A1)

where cell A1 contains the time **9:25:10** as a date-time serial number, returns **10**.

MONTH

Returns the month of a given date.

Syntax:

MONTH(date)

returns the month of **date** as a number, where January is **1** and December is **12**.

date may be text or a date-time serial number.

Example:

MONTH("2008-06-04")

returns **6**.

MONTH(A1)

where cell A1 contains the date **23Nov83** as a date-time serial number, returns **11**.

DAYS360

Returns the number of days between two dates, using the 360 day year.

Syntax:

DAYS360(enddate; startdate; method)

startdate and **enddate** are the starting and ending dates (text or date-time serial numbers). If **startdate** is earlier than **enddate**, the result will be negative.

method is an optional parameter; if **0** or omitted, the US National Association of Securities Dealers (NASD) method of calculation is used; if **1** (or <>0) the European method of calcuation is used.

The calculation assumes that all months have 30 days, so a year (12 months) has 360 days.

See Financial date systems for more details.

Example:

DAYS360("2008-02-29"; "2008-08-31")

returns **180**, that is, 6 months of 30 days.

WEEKDAY

Returns the day of the week for a given date.

Syntax:

WEEKDAY(date; type)

returns the day of the week that **date** falls on, as a number.

The number returned depends on **type**, as follows:

Day of the week	Type=1	Type=2	Type=3
Sunday	1	7	6
Monday	2	1	7
Tuesday	3	2	1
Wednesday	4	3	2
Thursday	5	4	3
Friday	6	5	4
Saturday	7	6	5

If **type** is omitted, it is assumed to be **1**.

Example:

WEEKDAY("2008-06-14"; 1)

returns **7**.

14Jun08 falls on a Saturday.

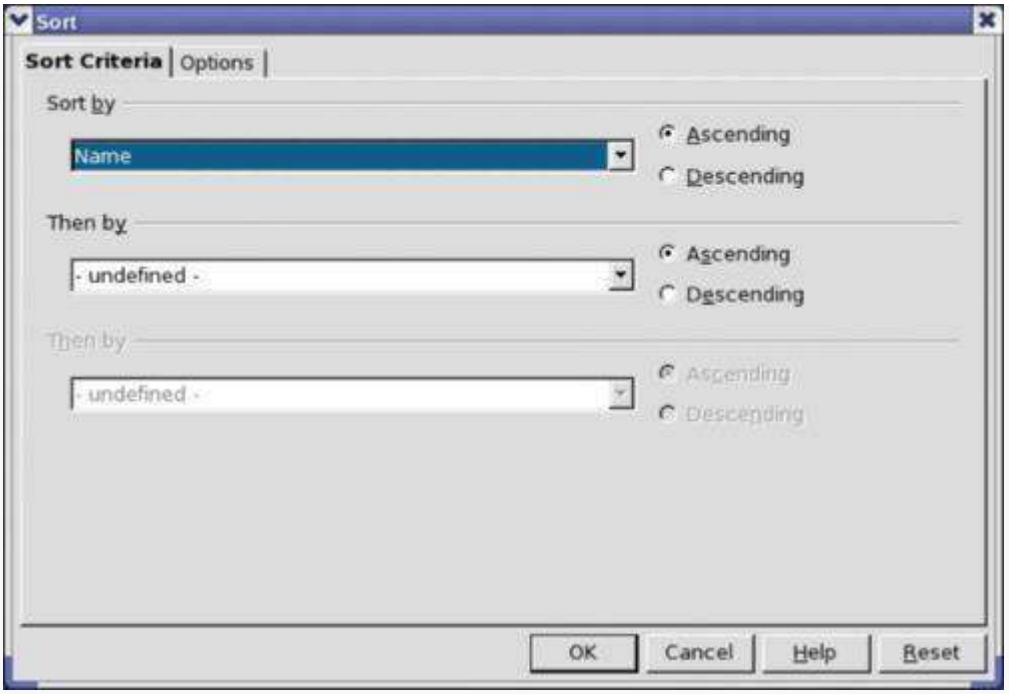
Unit 2: Formulas, Chart and Data

Data:

Sort Data, Filter data

Sort Data:

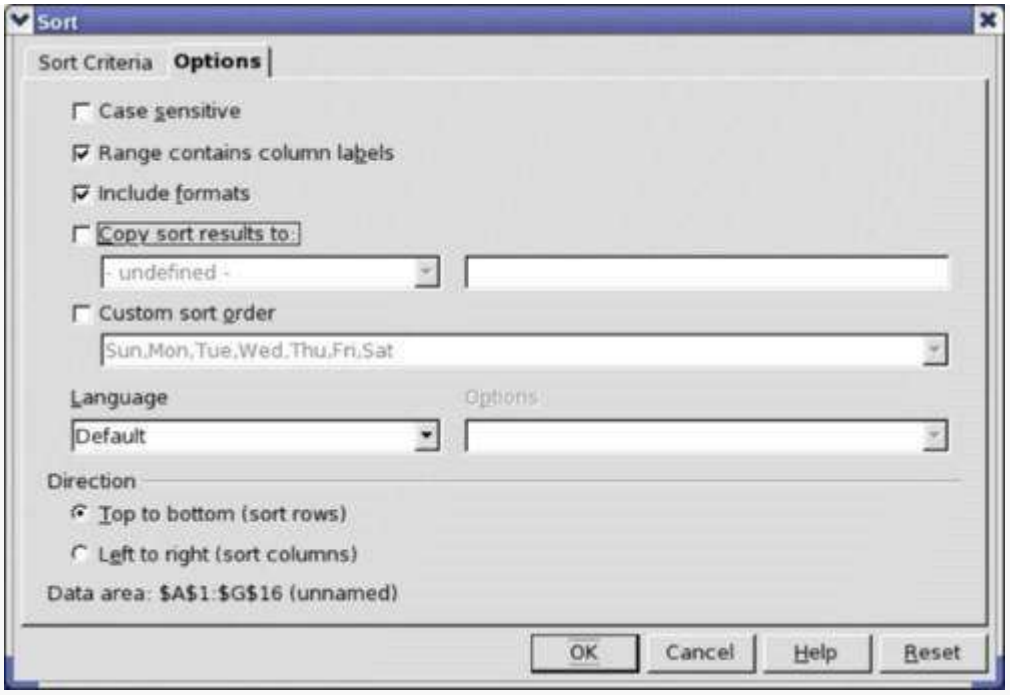
The sorting mechanism in a Calc document rearranges the data in the sheet. The first step in sorting data is to select the data that you want to sort. To sort the data, select the cells from A1 to G16—if you include the column headers, indicate this in the sort dialog. Use **Data > Sort** to open the Sort dialog. You can sort by up to three columns or rows at a time in ascending or descending order.



Sort by the Name column.

Click on the Options tab to set the sort options. Check the **Range contains column labels** checkbox to prevent column headers from being sorted with the rest of the data. The Sort by list box in the figure above displays the columns using the column headers if the **Range contains column labels** checkbox in the figure below is checked. If the **Range contains column labels** checkbox is not checked, however, then the columns are identified by their column name; Column A, for example.

Normally, sorting the data causes the existing data to be replaced by the newly sorted data. The **Copy sort results to** checkbox, however, causes the selected data to be left unchanged and a copy of the sorted data is copied to the specified location. You can either directly enter a target address (Sheet3.A1, for example) or select a predefined range.



Set sort options.

Check the **Custom sort order** checkbox to sort based on a predefined list of values. To set your own predefined lists, use **Tools > Options > OpenOffice.org Calc > Sort Lists** and then enter your own sort lists. Predefined sort lists are useful for sorting lists of data that should not be sorted alphabetically or numerically. For example, sorting days based on their name.

Filter Data:

There are three types of filter,

1) AutoFilter

2) Standard Filter

3) Advanced Filter

1) AutoFilter

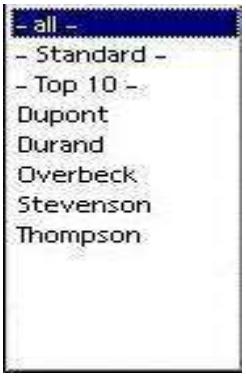
The Autofilter is slightly different from the standard filter. In order to understand what it does, let's use it and see what we get. Select the range of data, including column names.

- under **Data**, select **Filter – Autofilter**, and see what appears on the screen :

Next to each field name, a small button with an arrow has appeared. Click on the one next to the field '**Name**' to see what it does :

2)

	A	B	C	D	E
1	Name	Age	Year of Birth	Gender	Salary
2	Thompson	22	1980	Female	41250
3	Overbeck	23	1979	Female	31800
4	Dupont	25	1975	Male	26150
5	Durand	21	1981	Male	35475
6	Stevenson	20	1982	Female	38650
7					



As You will have noticed, the list of names represents the filter criteria and you can apply them differently to each column.
If you click on **Standard**, the same window appears that already explained.

Let's click on Dupont and observe the result obtained :

	A	B	C	D	E
1	Name	Age	Year of Birth	Gender	Salary
4	Dupont	25	1975	Male	26150

The criteria corresponding to the name Dupont, and only Dupont, are displayed.

To cancel the filter operation, select the range and choose **Data – Filter – Autofilter**, untick **Autofilter**

2) Standard Filter

The use of filters is as simple as sorting. After having selected your range :

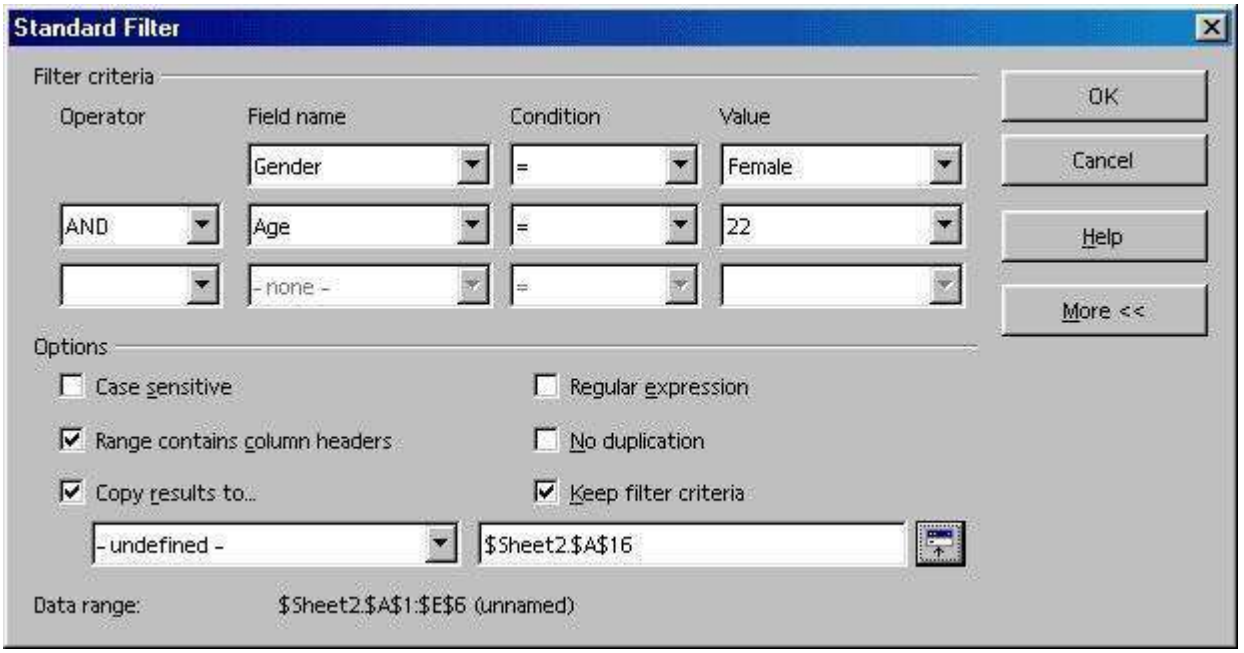
- go to the menu **Data – Filter – Standard Filter**

- The following window should appear :

- fill in the data field names on which you want to base your filter by selecting them in the drop-down menu,

- here again, you can use up to 3 criteria with Boolean operators (and, or) and other conditions such as equals, greater than, less than, less than or equal to.....The value is represented by the data on which the filter is to be carried out in relation to the field name chosen,

- the More button, enables you to edit a table, taking into account regular expressions, case sensitivity or duplicates,



- in our example, we chose to copy the result onto the same sheet, a bit lower down (using the selection icon ).

Here's the result :

16	Name	Age	Year of Birth	Gender	Salary
17	Thompson	22	1980	Female	41250
18					

3) Advanced Filter

The advanced filter is a filter that lets you use more than 3 filter criteria, up to a maximum of 8. In order to use this filter, you have to create an array in which you'll enter the criteria; but let's use an example, it makes life so much easier !

Let's start from the example we already have :

	A	B	C	D	E
1	Name	Age	Year of Birth	Gender	Salary
2	Thompson	22	1980	Female	41250
3	Overbeck	23	1979	Female	31800
4	Dupont	25	1975	Male	26150
5	Durand	21	1981	Male	35475
6	Stevenson	20	1982	Female	38650

1. copy the row bearing the field names of your range (Name, Age...) into empty cells on your sheet, for example at row 10,

11	**Name**	**Age**	**Year of Birth**	**Gender**	**Salary**
12	Dupon	<=25			>35000

2. now enter your sort criteria, under each column, bearing in mind that criteria on **a same horizontal row** are attached to the logical value by an 'AND', whereas **vertically** they are attached as 'OR'.

So, in this example, we are searching for people whose age is less than or equal to 25 AND whose salary is greater than 35000. Here are the results after applying the filter (we'll see how in a second)

17	Name	Age	Year of Birth	Gender	Salary
18	Thompson	22	1980	Female	41250
19	Durand	21	1981	Male	35475
20	Stevenson	20	1982	Female	38650
21					

This is exactly what we asked for !
So, after having created your array

3. select the data range to which the filter should apply

4. choose **Data – Filter – Advanced Filter**,

5. in the window that appears, using the selection button, select the array that you defined at rows 10 to 12,

6. in the options (More>>), also indicate where you want your filtered data to appear (we put it at row 17) and click on **OK**.

Text to columns, Remove DuplicationText

to columns:

To import delimited text (typically comma or tab delimited) into the spreadsheet through a file or a clipboard, Calc will parse the text and split it apart using whichever delimiter character you choose including tab, comma, space, or semicolon. A delimiter simply means a separator.

Steps and example:

Spreadsheet contains city and country names delimited by a comma:

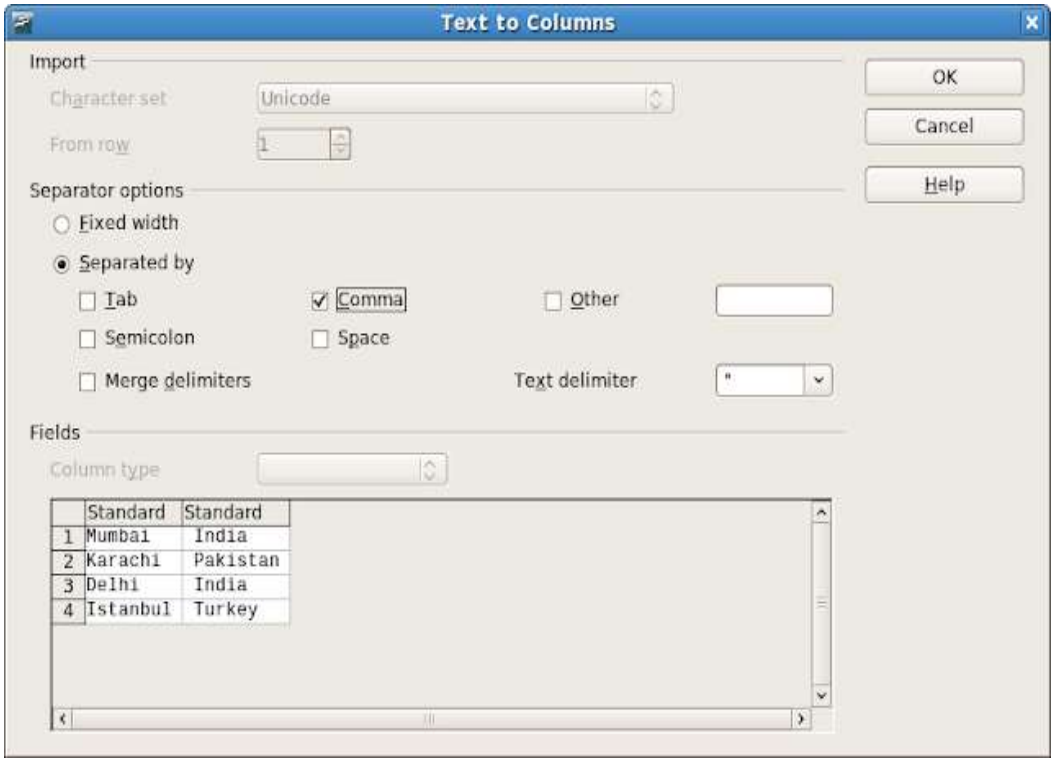
	A	B
1	Mumbai, India	
2	Karachi, Pakistan	
3	Delhi, India	
4	Istanbul, Turkey	
5		
6		

To remove the comma and put the country names into column B, we proceed as follows:

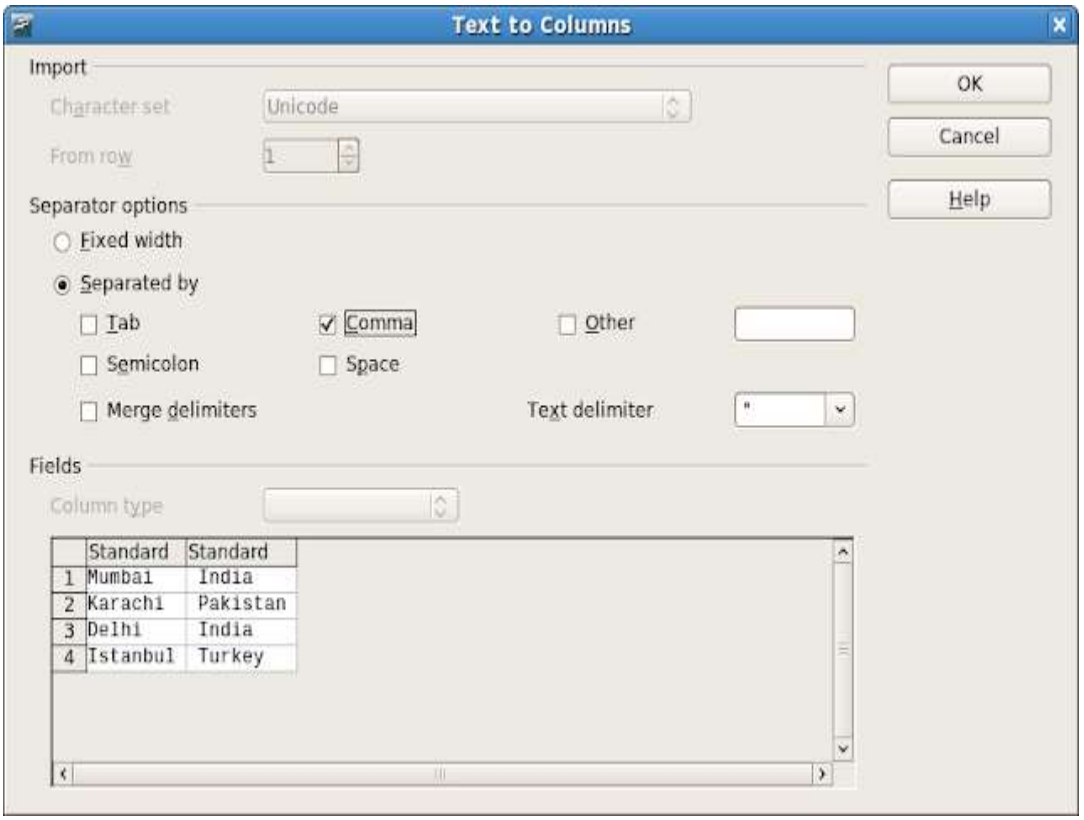
1. Make sure there are enough clear cells to accept the new values. Otherwise, the cells will be overwritten. In this case, column B must be empty because the data will grow one column to the right.

2. Highlight the full range of cells (in this case, A1 through A4).

3. Click **Data > Text to Columns**.



4. Uncheck the box **Tab**.
5. Check the box **Comma**.

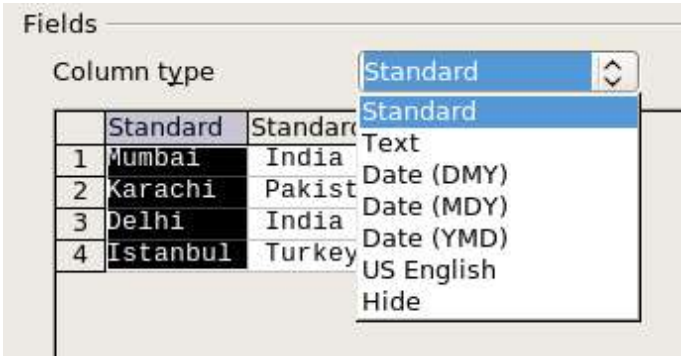


6. Click the box **OK**.
   You're done, and here are the results:

	A	B
1	Mumbai	India
2	Karachi	Pakistan
3	Delhi	India
4	Istanbul	Turkey
5		
6		

Column options

To specify the type of data in the column, in the preview area click the top of the column. Then, choose a type from the drop-down list. In many cases, this step is unnecessary.

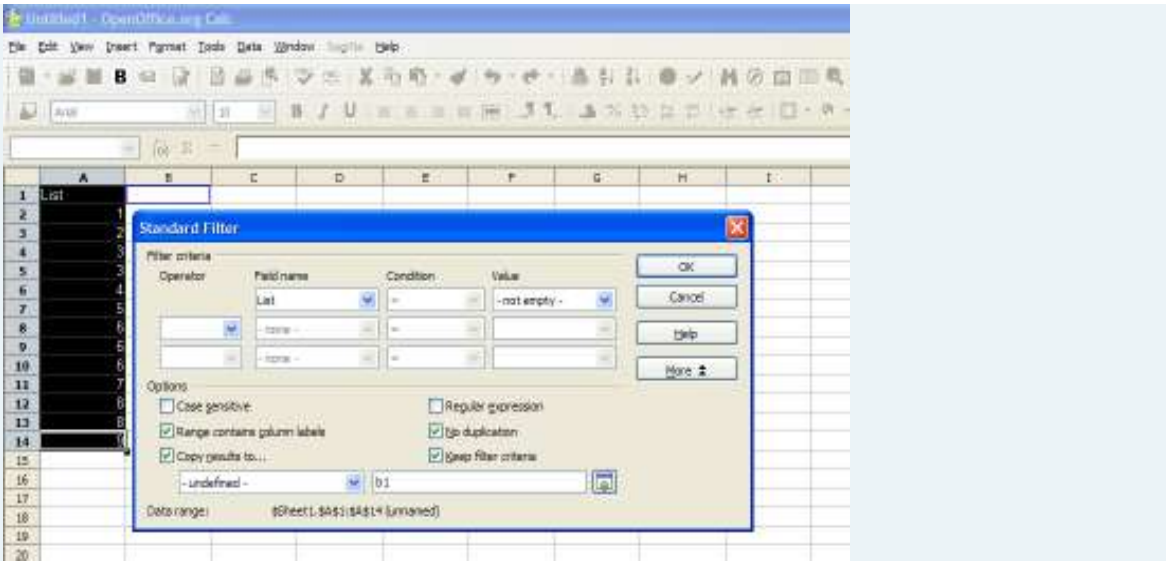


Remove Duplication:

Select the entire range containing data to filter, then click on the menu Data > Filter > Standard Filter and:

1. Use a condition that is always TRUE, like field1 = Not empty
2. Click on the button more, select Remove Duplicate, select Copy to and put the address of an empty cell

The whole range (without duplicate) will be analyzed and copied at that new address.



Consolidated Data (Sum, Count, Max, Min, Average)

Data > Consolidate provides a way to combine data from two or more ranges of cells into a new range while running one of several functions (such as Sum or Average) on the data. During consolidation, the contents of cells from several sheets can be combined into one place.

1) Open the document containing the cell ranges to be consolidated.

2) Choose **Data > Consolidate** to open the Consolidate dialog. Figure 240 shows this dialog after making the changes described below.

3) The **Source data range** list contains any existing named ranges (created using **Data > Define Range**) so you can quickly select one to consolidate with other areas.

4) If the source range is not named, click in the field to the right of thedrop-down list and either type a reference for the first source data range or use themouse to select the range on the sheet. (You may need to move the Consolidate dialog or click on the Shrink icon to reach the required cells.)

5) Click **Add**. The selected range is added to the Consolidation ranges list.

6) Select additional ranges and click **Add** after each selection.

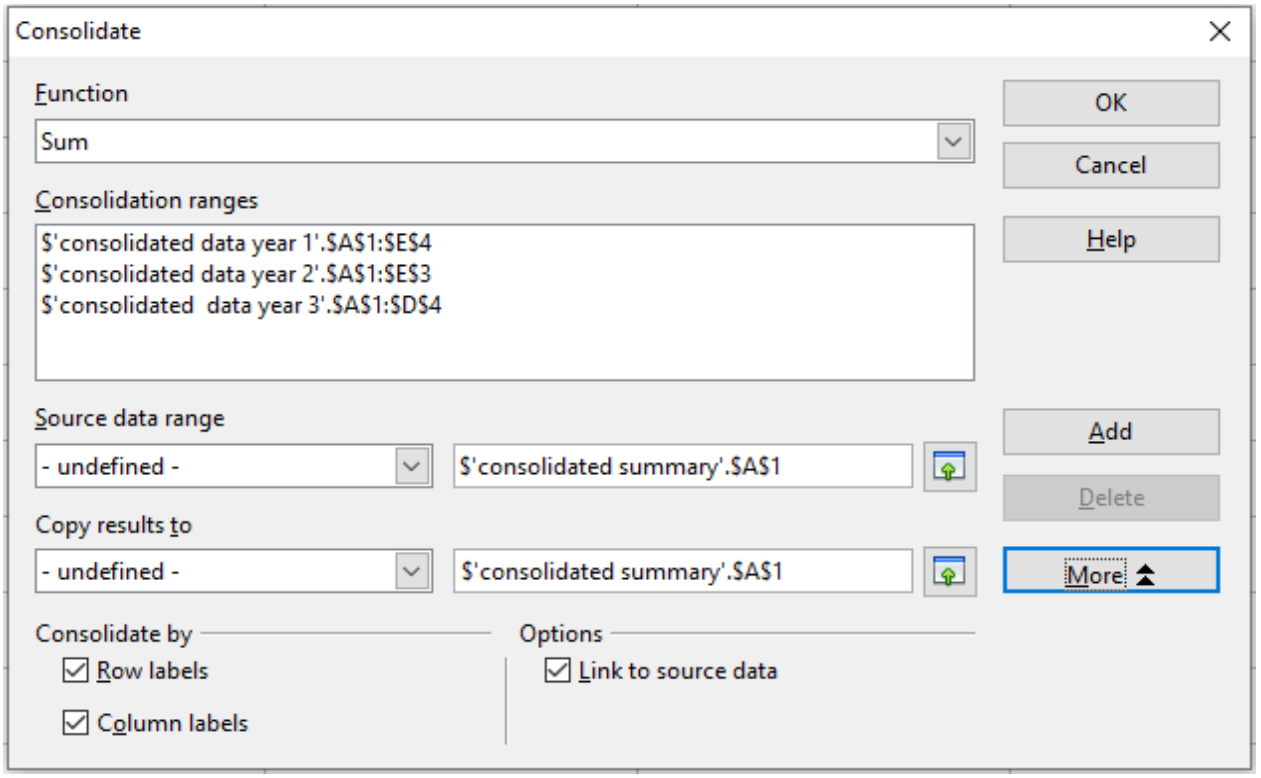


Figure : Defining the data to be consolidated

7) Specify where you want to display the result by selecting a target rangefrom the **Copy results to** drop-down list.

If the target range is not named, click in the field next to **Copy results to** and enter the reference of the target range or select the range using the mouse or position the cursor in the top left cell of the target range. *Copy results to* takes only the first cell of the target range instead of the entire range as is the case for *Source data range*.

8) Select a function from the Function list. This specifies how the values of the consolidation ranges will be calculated. The default setting is Sum, whichadds the corresponding cell values of the Source data range and gives the result in the target range.

Most of the available functions are statistical (such as Average, Min, Max, Stdev), and the tool is most useful when you are working with the same data over and over.

9) At this point you can click **More** in the Consolidate dialog to access the following additional settings:

- Select **Link to source data**,If you link the data, any values subsequently modified in the source range are automatically updated in the target range.
- Under **Consolidate by**, to consolidate by row labels or column labels, the label must be contained in the selected source ranges. The text in the labels must be identical, so that rows or columns can be accurately matched.

10) Click **OK** to consolidate the ranges.

11) If you are continually working with the same range, then you probably want to use **Data** > **Define Range** to give it a name.

The consolidation ranges and target range are saved as part of the document. If you later open a document in which consolidation has been defined, this data is still available.

Example:

In our example, we have data for 3 years expenditure on tea, coffee and milk. The data is broken down into quarters and stored in one year per worksheet in one workbook. We can create a _Consolidated Summary' sheet which will show expenditure by year and quarter. It does not matter if the data has the same arrangement of columns and rows or not. Excel will sort that out for you. Amazing!

Year 1 worksheet

	A	B	C	D	E
1		Quarter 1	Quarter 2	Quarter 3	Quarter 4
2	Coffee	£ 2,128	£ 3,526	£ 5,372	£ 9,378
3	Tea	£ 1,633		£ 5,392	£ 1,730
4	Milk	£ 4,837		£ 3,082	£ 5,272

Year 1 | Year 2 | Year 3 | Consolidated Summary

Year 2 worksheet

8		Quarter 1	Quarter 2	Quarter 3	Quarter 4
9	Coffee	£ 2,944	£ 3,528	£ 7,822	£ 8,464
10	Milk	£ 8,227		£ 9,462	£ 2,748
11					

Year 1 | Year 2 | Year 3 | Consolidated Summary

Year 3 worksheet

7		Quarter 4	Quarter 3	Quarter 1	
8	Coffee	£ 9,664	£ 7,123	£ 2,643	
9	Tea	£ 7,356	£ 2,865	£ 6,092	
10	Milk	£ 6,787	£ 1,595	£ 8,356	
11					

Year 1 | Year 2 | Year 3 | Consolidated Summary

As you can see, Years 1, 2 and 3 each have different arrangements of columns and rows. There is no tea in Year 2; in Year 3 the first quarter appears at the end of the table, there is no Quarter 2and the Quarters are not in order. The ranges you consolidate do not have to be of the same size ineach worksheet, the number of rows or columns might be different from sheet to sheet. And yet, you can still consolidate the data into a summary sheet. How incredible is that!

Consolidation steps:

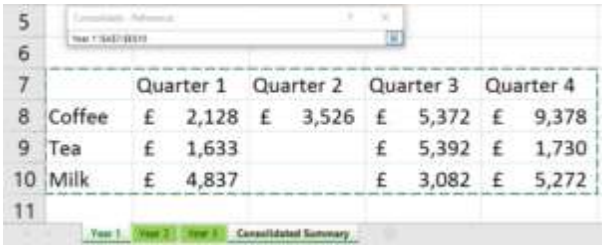
To start using the Data Consolidation tool, you need to select an empty sheet in the workbook as your master worksheet or add a new one if necessary. The worksheet is renamed _Consolidated Summary‘.

Select the upper-left cell of the area where you want the consolidated data to appear.

Choose Data > Consolidate to view the Consolidate dialog:

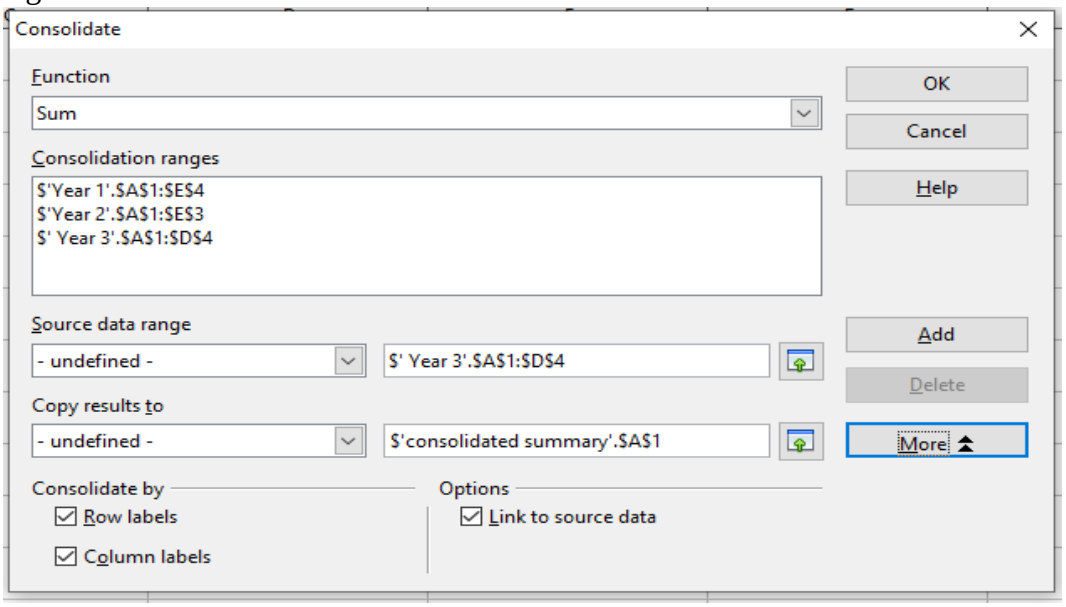
In the Function box, click the summary function that you want to use to consolidate the data. As you will see from the drop-down, there are 11 functions to choose from. For our data we want to add up the values so we‘ll set the Function to Sum.

Click in the Reference area and select the first data range to consolidate – to do this you will need to click the Sheet tab i.e. –Year 1‖ and then drag over the data (including row and column headings) and then click the Add button to add this first set of data to the consolidation dialog.



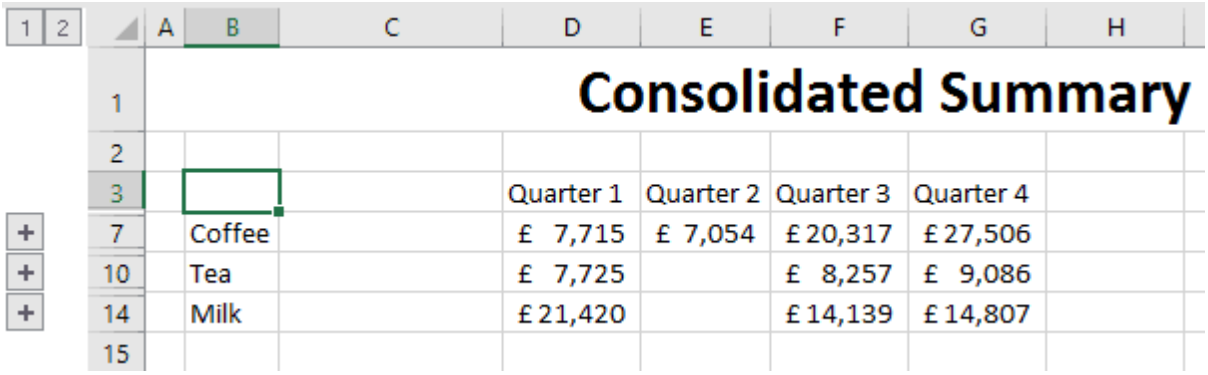
		Quarter 1	Quarter 2	Quarter 3	Quarter 4
8	Coffee	£ 2,128	£ 3,526	£ 5,372	£ 9,378
9	Tea	£ 1,633		£ 5,392	£ 1,730
10	Milk	£ 4,837		£ 3,082	£ 5,272

Continue in the same way by clicking on the next sheet, highlighting the data, and clicking on the Add button until all your data and worksheets appear in the References section of the dialog e.g. –Year 2‖ and –Year 3‖.



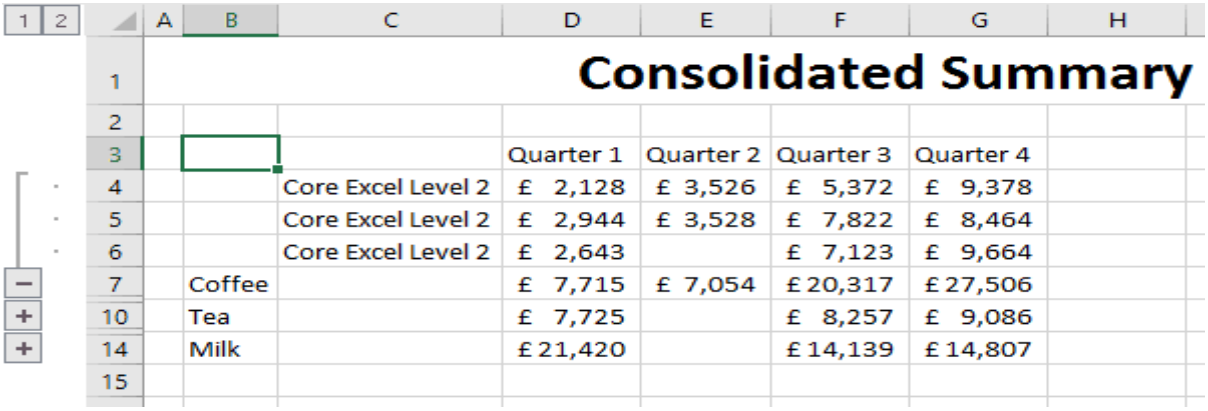
To indicate where the labels are located in the source ranges, select the check boxes under Use labels in: either the Top row, the Left column, or both. In this example, Top row is the name of thequarters, i.e. Quarter 1, Quarter 2, etc. and the Left Column are the list of items, i.e. Coffee, Tea and Milk.
Automatic vs. Manual updates: If you want Excel to update your consolidation table automatically when the source data changes, select the Create links to source data check box. Ifunchecked, you can still update the consolidation manually.

When you click OK, Excel summarises all the data into your new sheet as your master worksheet(Consolidated Summary).



1		Consolidated Summary				
2						
3			Quarter 1	Quarter 2	Quarter 3	Quarter 4
7		Coffee	£ 7,715	£ 7,054	£ 20,317	£ 27,506
10		Tea	£ 7,725		£ 8,257	£ 9,086
14		Milk	£ 21,420		£ 14,139	£ 14,807
15						

You'll immediately notice a change to the Excel worksheet that you may never have seen before.You will see grouping tools down the left of the screen which you can use to display and hide thedata. Next to rows 7, 10 and 14, there are plus signs. This signifies that cells are part of a groupthat is currently collapsed. Clicking on the plus sign will expand the group and there is a line Connecting these rows to the left:



1		Consolidated Summary				
2						
3			Quarter 1	Quarter 2	Quarter 3	Quarter 4
4		Core Excel Level 2	£ 2,128	£ 3,526	£ 5,372	£ 9,378
5		Core Excel Level 2	£ 2,944	£ 3,528	£ 7,822	£ 8,464
6		Core Excel Level 2	£ 2,643		£ 7,123	£ 9,664
7	Coffee		£ 7,715	£ 7,054	£ 20,317	£ 27,506
10	Tea		£ 7,725		£ 8,257	£ 9,086
14	Milk		£ 21,420		£ 14,139	£ 14,807
15						

You'll find that the second column (Column C) of data shows the name of the workbook (Core Excel Level 2) that contains the data. You can hide this column if you want to, by right clicking it and choosing Hide. This simply hides the column so the data is there should you need to refer.