How to… Use common functions in Excel 2010

Overview

One of the most powerful features in Excel is the vast array of functions that Microsoft have made available. These functions can save hours of time, replacing the need for a calculator and endless pencils and paper – not to mention a brain the size of Australia! But this very power can be a little daunting. How can you ever remember all these functions?

The good news is that you really don't have to. Many of them – most of them – you'll never need, and never use. Before writing this guide, I counted how many functions there are in Excel 2010. Whenever anyone's asked me, I've always said "Well over 100", but in truth it's been a few years (and a few versions) since I actually went through and counted them.

In Excel 2010, I counted 400 functions. Four Hundred! What do they all do? No idea. What are they used for? Haven't a clue. And I'll wager that no one – even at Microsoft's Excel development team – does know them all. Why? Because Excel is all things to all people. If you are a statistician, working on advanced probablility calculations, the functions you need are there. And if you're a high-level accountant, all your functions are there too. But the accountant won't ever use the statistician's functions, and the statistician wouldn't have a clue about the accountant's.

So, this isn't a definitive guide to all Excel's functions. If you really want that, you can always turn to the built-in help system. This guide is intended to give you a real-world idea of what some of the more common functions are, how to use them, and when you might find them useful.

First, though, a little terminology that you'll find used throughout this guide.

Term	Defiinition
Function	A function is a keyword that represents a built-in calculation. Functions allow you to pass in some kind of information (usually), they work with that information, and they display an answer
Argument	Functions often need information in order to perform their calculation. Each piece of information is called an argument. Some functions need no arguments, some need several, and some functions have arguments which are optional – they may change the result of the function, but they don't need to be provided every time. Most functions take their arguments in the form of either cells, or values. For example, the SUM function may be passed cell references to add up: **`=SUM(A1:B10)`** or values: **`=SUM(2,3,4,5)`**. Arguments are separated by commas. Arguments which are text (rather than numbers or ranges) should go in **`"double quotes"`**
Range	A range is simply one or more cells. A single cell is represented most commonly by its address, eg A1, B3, J219. A group of cells in a block are most commonly referred to by the address of the first cell, then a colon, then the address of the last cell, eg A1:B10 or Q29:T45. It is possible, however, to give a name to a cell or group of cells, in which case this name can be used instead of the address. So, if the range from A1 to B10 has been named AnnualSales, **`=SUM(A1:B10)`** and **=SUM(AnnualSales)** would return the same value.

Sample data

In order to simplfy things, and to save space, all the functions described will refer to the same set of data, as shown below.

	A	B	C	D	E	F	G	H	I	J
1		Cars R Us								
2		Sales Report - 2nd half 2010								
3										
4			July	August	September	October	November	December	Total	%
5		Ford	£95,000.00	£124,500.00	£110,000.00	£104,000.00	£113,000.00	£120,000.00	£666,500.00	
6		Fiat	£85,750.00	£97,000.00	£86,000.00	£82,000.00	£89,950.00	£92,500.00	£533,200.00	
7		Toyota	£68,500.00	£78,000.00	£72,500.00	£75,750.00	£80,000.00	£87,500.00	£462,250.00	
8		Lexus	£48,000.00	£63,000.00	£52,000.00	£51,000.00	£44,000.00	£38,000.00	£296,000.00	
9		Total								

Headings in this file are from **`C4:J4`** and from **`B5:B9`** **Data** in this file is in cells **`C5:I8`**
Blank cells are from **`C9:I9`** and from **`J5:J9`**

Function	Description	Arguments	Example
SUM	Adds its arguments	From 1 to 255 ranges or values	**=SUM(C5:C8)** Answer = 297250 **=SUM(C5, 5000,C8)** Answer = 148000
AVERAGE	Returns the mean average of its arguments	From 1 to 255 ranges or values	**=AVERAGE(C5:C8)** Answer = £74,312.50 **=AVERAGE(2,4,6)** Answer = 4
MAX	Returns the largest value of its arguments	From 1 to 255 ranges or values	**=MAX(C5:C8)** Answer = 95000 **=MAX(C5:I8)** Answer = 666500
MIN	Returns the smallest value of its arguments	From 1 to 255 ranges or values	**=MIN(C5:C8)** Answer = 48000 **=MIN(C5:I8,4,-300)** Answer = -300
COUNT	Returns the number of cells or values in its list of arguments which contain numbers or are themselves numeric.	From 1 to 255 ranges or values	**=COUNT(B4:J9)** Answer = 28 **=COUNT(B4:J9,"Fred",2,3)** Answer=30
COUNTA	Returns the number of cells in its list of arguments which are not empty. If arguments are supplied which are values rather than ranges, these are also counted. If cells contain formulas, these are always counted.	From 1 to 255 ranges or values	**=COUNT(B4:J9)** Answer = 41 **=COUNT(B4:J9,"Fred",2,3)** Answer = 44
COUNTIF	Returns the number of cells within a given range which meet a given criteria.	**First:** The range of cells to examine **Second:** The criteria to determine whether a cell in the range in the first argument should be counted. This can be a value to match, a character to look for (use ? to represent 1 character, * to represent any number of characters), a comparison (in quotes) or a reference to a cell. Criteria containing symbols must be in **"double quotes"**	**=COUNTIF(B4:I8,120000)** Answer = 1 (cell H5 has this value) **=COUNTIF(B4:I8,">120000")** Answer=5 (cells D5, I5, I6, I7 and I8) **=COUNTIF(B4:I8,"T*")** Answer=2 (Toyota in B7, Total in I4) **=COUNTIF(B4:I8,"?o*")** Answer=4 (Toyota, Ford, November and Total all have O as the 2nd letter) **=COUNTIF(B4:I8,">"&I6)** Answer=1 (the & joins the greater than symbol with cell I6. Only I5 has a value greater than I6)
SUMIF	Adds up those cells that meet a given criteria. The criteria are provided in the same format and to the same rules as in the COUNTIF function above.	**Either 2 or 3 arguments:** If 2 arguments are provided: **First:** the range of cells to examine for the criteria to be met. If the criteria is met, the cell value is added to the total **Second:** the criteria to judge whether a cell should be added to the total. If 3 arguments are provided: **First:** the range of cells to examine for the criteria in the second argument **Second:** the criteria used by the first argument **Third**: The cells to be added to the total, if the corresponding cell in the range specified in the first argument meets the criteria in the second argument.	**=SUMIF(C5:C8,">50000")** Answer=249250 – the sum of those cells in the range C5:C8 with a value greater than 50000 **=SUMIF(C5:C8,">"&C7)** Answer=180750 – the sum of those cells in the range C5:C8 with a value greater than the value in C7. (Note that the & symbol joins the > (which must be in quotes) with the cell reference C7. **=SUMIF(B5:B8,"Ford",C5:C8)** Answer=95000 – the sum of those cells in the range C5:C8 whose corresponding cell in the range B5:B8 holds the value "Ford" **=SUMIF(B5:B8,"?o*",C5:C8)** Answer=163500 – the sum of those cells in the range C5:C8 whose corresponding cell in the range B5:B8 has a second letter of o (Ford and Toyota)