Excel 2010
Functions

4/18/2011
Archdiocese of Chicago
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MICROSOFT EXCEL 2010 FUNCTIONS

OVERVIEW

One of the primary reasons for using Excel is its ability to calculate data within a spreadsheet.

Excel contains over 200 different functions that you can use.

Covering every possible function would be impossible (and a complete waste of time). Instead, this course covers several of the "all-purpose" functions that almost anyone could make use of.

AUTOSUM

Adding rows and columns of numbers is one of the most common uses of an Excel spreadsheet. Excel makes it easy to use the SUM function with AutoSum.
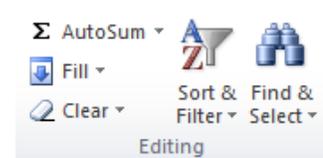
To use AutoSum by selecting the total cell:
* Select the cell that will contain the result of the SUM function
* Click the AutoSum icon
* Highlight the cells to add (if Excel guessed incorrectly)
* Tap the Enter key

Instead of selecting the cell where the total will appear, you can highlight the cells you are adding and use AutoSum.

To use AutoSum by selecting the cells to add:
* Select the cells you are adding
* Click the AutoSum icon

> *When you use AutoSum in this manner, the total will appear in the first empty cell to the right of the selected cells if you only select cells within a single row. Otherwise, the total(s) will appear in the first empty cell below the selected cells.*

To guarantee that the AutoSum adds the correct cells AND to AutoSum rows and columns at the same time, use the following method.

To use AutoSum by selecting the cells to add AND the cells that will contain the total:
* Select the cells you are adding AND the empty cells that will contain the total(s)
* Click the AutoSum icon

In addition, Excel 2010 lets you use the AutoSum button to quickly create an Average, Count, Min or Max formula. Instead of clicking directly on the AutoSum button, click the drop-down arrow next to AutoSum and choose the desired function.

FORMULA SYNTAX

A formula is any entry in a cell where Excel will calculate.

In a basic formula, you enter the actual calculation.

ALL formulas begin with an equals sign (=). This tells Excel to actually calculate the result.

For common math operations, use the following symbols:

Operation	Symbol	Example	Answer
Addition	+	=3+2	5
Subtraction	-	=3-2	1
Multiplication	*	=3*2	6
Division	/	=3/2	1.5
Exponents	^ (Shift-6)	=3^2	9

When entering a formula, you can enter exact values or the address of cells that contain the values used in the formula.

FUNCTION SYNTAX

Functions are special formulas that run more complex calculations, simplify the creation of some basic formulas, and avoid the risk of exceeding the maximum characters in a formula.

All functions in Excel follow a similar syntax:

=NAME(var1, var2, var3)

Like all other formulas, a function begins in an equals sign. The name of the function is next followed by any variables that function uses, enclosed in parentheses. Even if a function doesn't use any variables, the parentheses are required.

In certain functions, the variables all have the same meaning. In other functions, different variables are used differently within the function.

REFERENCING GROUPS OF CELLS

Within a function, you might be able to set a range of cells as one or more of the variables within the function.

Ranges of cells are reference by indicating the "corner points" of the range and using a colon (:) to separate those cell addresses.
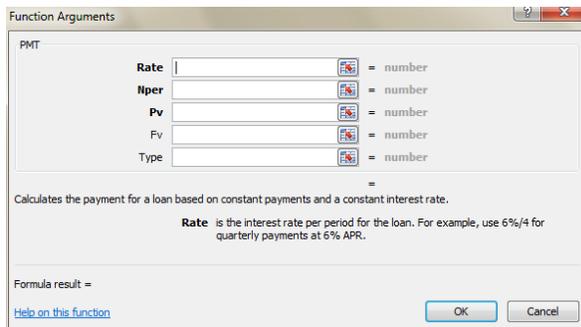
For example: **A1:E5**

FORMULAS RIBBON

The Function Library group in the Formulas ribbon lets you access different functions available within Excel. You can select the desired function from the appropriate drop-down or use Insert Function to locate the necessary function.

To search for a function:
- Click the Insert Function button
- In the *Search for a function box*, type a brief description of the calculation and click Go
- In the *Select a function* list, click on a function and review the description
- Click OK after selecting the appropriate function

After selecting a function, the Function Arguments dialog opens. This dialog shows the different parts of the function, describes their use, and indicates whether an argument is required (if the argument name is bold, it is required).

You can enter a static value for a function argument, a cell address, or cell range (if appropriate for that argument). You can move the Function Argument dialog box around to make it easier to see your worksheet's contents.

You can also click Help on this function to get additional information about the function. This can be incredibly useful for certain functions. The help topics for functions typically provide tips and examples of the function.

AVERAGE

=AVERAGE(Number1, Number2, Number3,…,Number30)

The AVERAGE function determines the arithmetic mean of the numbers (total of all of the number divided by the amount of numbers).

In the AVERAGE function, each variable is used in the same way. The variables can be an actual number that you enter, the address of an individual cell, or a range of cells.

SUM

=SUM(Number1, Number2, Number3,…,Number30)

The SUM function returns the total of the numbers.

In the SUM function, each variable is used in the same way. The variables can be an actual number that you enter, the address of an individual cell, or a range of cells.

ABSOLUTE VS RELATIVE REFERENCES

When you reference cells within a formula, Excel uses the relative references of the cells by default. If you are going to copy the function to other locations in the workbook and need to reference the same cells, you will need to set absolute references.

For example, Cell C1 contains the formula =A1+B1. If you copy the formula in cell C1 to cell C2, cell C2 will contain the formula =A2+B2. That is because this formula uses relative references. With relative references, the addresses of cells are not absolute. Instead, the selected cells are based on where they are in relation to the cell containing the formula.

So, if cell C1 contains =A1+B1, it really means: Display the total of the two cells directly to my left.

If a formula always needs to reference the exact same cells when it is copied to another location, you will need to make those cell references absolute.

Excel uses the dollar sign ($) as an indicator for absolute references. The dollar sign needs to appear before both the column letter and row number.

How can you tell whether you should use an absolute reference?

- Absolute references are only important if you are going to copy the formula to several locations in a workbook.
- If you are rebuilding the formulas one at a time, look for the cell addresses that remain constant from one formula to the next. Those are the cells that should use absolute references.

PERCENT OF THE TOTAL

Determining what percent of the grant total isn't an actual function within Excel. Instead, you will create the formula by hand.

=Part/GrandTotal

For example, if you have a spreadsheet that contains total contribution amounts for each month in a year, and the grand total for the year, to find out what percent was contributed each month, you take the amount for the month and divide it by the grand total.

If the grand total is in a cell within the workbook, use an absolute reference for the Grand Total so that you can copy the formula to each month.

MAX

=MAX(Number1, Number2, Number3,…,Number30)

The MAX function returns the largest value in a set of numbers.

In the MAX function, each variable is used in the same way. The variables can be an actual number that you enter, the address of an individual cell, or a range of cells.

The MAX function ignores empty cells and text values.

MIN

=MIN(Number1, Number2, Number3,…,Number30)

The MIN function returns the smallest value in a set of numbers.

In the MIN function, each variable is used in the same way. The variables can be an actual number that you enter, the address of an individual cell, or a range of cells.

The MIN function ignores empty cells and text values.

MODE

=MODE(Number1, Number2, Number3,…,Number30)

The MODE function returns the most commonly occurring value in a set of numbers.

In the MODE function, each variable is used in the same way. The variables can be an actual number that you enter, the address of an individual cell, or a range of cells.

The MODE function ignores empty cells and text values.

MEDIAN

=MEDIAN(Number1, Number2, Number3,…,Number30)

The MEDIAN function returns the middle value in a set of numbers. Half of the values are above the median and half are below the median.

In the MEDIAN function, each variable is used in the same way. The variables can be an actual number that you enter, the address of an individual cell, or a range of cells.

The MEDIAN function ignores empty cells and text values.

ROUND

=ROUND(Number,Num_Digits)

The ROUND function rounds numbers.

The Num_Digits can be a positive or negative integer (or zero). If the Num_Digits is set to zero, the Number will round to the closest whole number. If Num_Digits is a positive value, it indicates how many decimal places you are rounding to (so Num_Digits of 2 would round to the nearest hundredth, or penny). If the Num_Digits is negative, it rounds to tens, hundreds, thousands, etc.

Unlike changing the number of decimals that are displayed, the Round function actually returns the rounded value. If you are dealing with several dollar amounts and are only using the display to convert to pennies, your total won't match up.

CEILING

=CEILING(Number,Significance)

The CEILING function rounds numbers UP to the specified significance (multiplier). This is useful when rounding prices up to the nearest nickel, for example.

=CEILING(1.42,.05) would return a value of 1.45

FLOOR

=FLOOR(Number,Significance)

The FLOOR function rounds numbers DOWN to the specified significance (multiplier). This is useful when rounding prices down to the nearest nickel, for example.

= FLOOR (1.42,.05) would return a value of 1.40

ODD/EVEN

=ODD(Number)

=EVEN(Number)

The ODD/EVEN functions round the number UP to the nearest odd/even number.

ROUND TO X (MROUND)

=MROUND(Number,Multiple)

Excel 2010 includes an MRound function that rounds a number to the closest value specified. You can quickly round dollar amounts to the nearest quarter and round numbers to the nearest multiple of 5.

Examples:

=MROUND(3.23,.25) [Returns 3.25]

=MROUND(17,5) [Returns 15]

COUNT

=COUNT(Number1, Number2, Number3,…,Number30)

The COUNT function returns the amount of numbers in the list of variables (normally cell addresses)

The COUNT function ignores empty cells and text values.

COUNTIF

=COUNTIF(Range,Criteria)

The COUNTIF function returns the number of cells in the range that meet the specified criteria.

Examples:

=COUNTIF(A1:A255,>50)

=COUNTIF(A1:A255,"Human Resources")

COUNTIF will count cells containing text, as long as they meet the specified criteria.

COUNTBLANK

=COUNTBLANK(Range)

The COUNTBLANK function returns the number of blank cells in the specified range.

SUMIF

The SUMIF function will add cells if the criteria is met.

SUMIF can be used in two different ways.

If you are running the criteria against the same cells you are adding, you only need to variables.

=SUMIF(Range,Criteria)

Example: =SUMIF(A1:A255,>50)

This example would give the total of all of the cells in the range whose values are greater than 50.

You can also use one range of cells as the criteria while adding the values from a different range.

=SUMIF(Range,Criteria,Sum_Range)

Example: =SUMIF(A1:A255,"Human Resources",F1:F255)

In this example, column A contains the department name while column F contains the salary.

CONCATENATING CELLS

Concatenation combines multiples values into one. While there is a CONCATENATE function, it's just as easy to build it by hand.

When you concatenate, use an ampersand (&) to indicate that you are concatenating. If you need to include literal text (spacing, punctuation, or actual words), enclose that text in quotes.

Example: **=A1&" "&B1**

> *Note: There is a CONCATENATE function. However, it's easier concatenate using ampersands.*

SPLITTING CELLS

The opposite of concatenation is splitting cells. However, if the data is inconsistent, you will have to manually correct the results.

While you could use a series of Text functions to split cells, the easiest way to split cells is via the menu.

To split cells:
- Insert enough blank columns to the right of the cells you are splitting to accommodate the resulting text. Get in the habit of inserting more columns that you think you need and then deleting the empty columns as necessary.
- Select the cells to split.
- Choose Data, Text to Columns
- In Step 1, keep Delimited selected and click Next
- In Step 2, select the character that indicates where each column should break and click Next
- In Step 3, click Finish

RUNNING TOTALS

A running total can be creating using a standard formula. The method you use to determine the running total is the same method you use to record checks and deposits in a checkbook.

To determine a running total, you will need 3 columns. One column for withdrawals, one column for deposits, and a balance column.

To determine the current balance, you take the previous total, subtract the withdrawal and add the deposit.

Once the running total formula is entered, you can then copy that formula to the other cells in the balance row.

IF

The IF function is used to return different values based on whether a certain condition is met or not.

=IF(Logical_test,Value_if_true,Value_if_false)

The logical test is typically a comparison of a cell's value. The Value(s) returned are either explicit values or additional calculations.

For example, a purchase might be eligible for a discount on the total if the purchase is greater than $50.00. If the total value of the purchase is in cell A1, you could use the following to give a 5% discount if the total is high enough.

=IF(A1>50,5%,0%)

For an IF statement, if you want to return a blank value, you need to use empty double-quotes.

=IF(A1>50,"Discount","")

You can nest IF statements inside other IF statements to apply multiple tests.

VLOOKUP

Multiple IF statements can become very convoluted and difficult to troubleshoot. Many nested IF statements can be converted to VLOOKUP functions.

In a VLOOKUP, you locate a value in a "table" within your workbook and return a value found in the row of that "table."

=VLOOKUP(Lookup_value,Table_array,Col_index_num,Range_lookup)

The Lookup value is the value you are comparing to the first column of the Table array. The Table array is the range of cells that you are looking in, including the column that contains the value you will return. The Col index num is the number of the column within the array whose value you are returning. The Range lookup (optional) can be set to False to indicate that the value you find must match exactly.

When the Lookup runs, it starts in the first row of the array and looks at the value in the first column. If the lookup value is greater than the value it finds, it moves to the next row. The lookup continues until it hits a value in the array that is greater than the lookup.

The values in the array MUST be sorted in ascending order (lowest to highest).

When you reference the Table array, use ABSOLUTE cell references (since the array won't move).

Direct any questions or comments to the IT Assistance Line at (312) 534-5227.