

Excel Functions to Know

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What is a function?

A function is a predefined equation that operates on one or more values and returns a single value. Operations that are complex and involve many cell references can be difficult or even impossible to implement with basic arithmetic formulas. Excel has a wide range of built in functions that help make even very complex or repetitive calculations easy.

Here are a few:

Sumif

You use the **SUMIF** function to sum the values in a range that meet criteria that you specify. For example, suppose that you want to sum up the salary of all the workers who belong to the "Sales" Department.

You can use the following formula:
 =SUMIF(A2:A15,"Sales",D2:D15)

Syntax
 SUMIF(range, criteria, [sum_range])

Sum up the salary of all the workers who belong to the "Sales" department

=SUMIF(C2:C15,"Sales",D2:D15)

To sum up the salary of all workers of the QA department

=SUMIF(C2:C15,"QA",D2:D15)

Sum up the salary of all workers older than 60

=SUMIF(B2:B15,">60",D2:D15)

	A	B	C	D
1	Name	Age	Department	Salary
2	Susie	24	Sales	\$ 14,000.00
3	Melissa	56	Management	\$ 88,000.00
4	Eric	34	QA	\$ 53,000.00
5	Lee	44	QA	\$ 54,000.00
6	John	26	Sales	\$ 32,000.00
7	Dayton	61	Sales	\$ 24,000.00
8	Frank	42	Management	\$ 78,000.00
9	David	39	Management	\$ 80,000.00
10	Jackie	32	Sales	\$ 44,000.00
11	Elisa	53	Sales	\$ 32,000.00
12	Debbie	22	QA	\$ 53,000.00
13	Amy	62	Sales	\$ 6,000.00
14	Mona	46	Sales	\$ 46,000.00
15	Jill	44	Management	\$ 81,000.00
16				

Sumifs

SUMIFS is similar to the SUMIF function except that is used to add data if specific criteria are met in multiple ranges of cells.

In the example at the right, you want to find the total balance of the Arvada branches with a savings account. You can use the following formula:

=SUMIFS(C2:C11,A2:11,"Arvada",B2:B11,"Savings")

Syntax
 SUMIFS(sum_range, criteria_range1, criteria1, [criteria_range2,criteria2], ...)

	A	B	C
1	Branch	Type	Balance
2	Arvada	Savings	\$ 5,698.00
3	Lakewood	Checking	\$ 78,878.00
4	Denver	Savings/Checking	\$ 7,865.00
5	Brighton	Checking	\$ 45,321.00
6	Brighton	Saving	\$ 12,356.00
7	Arvada	Savings	\$ 8,765.00
8	Denver	Checking	\$ 98,345.00
9	Lakewood	Checking	\$ 3,244.00
10	Denver	Savings	\$ 78,996.00
11	Lakewood	Savings	\$ 45,890.00

Countif

You can count cells that meet a specific criterion.

In this example only the Pen orders will be counted.

1. Select the cell in which you want to see the count (cell A12 in this example)
2. Type an equal sign (=) to start the formula
3. Type: COUNTIF(
4. Select the cells that contain the values to check for the criterion. In this example, cells A1:A10 will be checked
5. Type a comma, to separate the arguments
6. Type the criterion. In this example, you're checking for text, so type the word in double quotes: "Pen" *Note: upper and lower case are treated equally*
7. Hit the Enter key. The completed formula is:

	A	B	C	D
1	Item	Qty		
2	Pen	5		
3	Pencil	9		
4	Binder	9		
5	Pen	6		
6	Pen	15		
7	Binder	12		
8	Pencil	10		
9	Binder	6		
10	Pen	11		
11				
12	=COUNTIF(A1:A10,"Pen")			
13	COUNTIF(range, criteria)			

=COUNTIF(A1:A10,"Pen")

The result will be 4, the number of cells that contain "Pen"

SUBTOTAL

SUBTOTAL formula is used to find out subtotal of a given range of cells. Unlike SUM, AVERAGE, COUNT etc. which do one thing, *SUBTOTAL is versatile*. You can use it to sum up, average, count, etc.

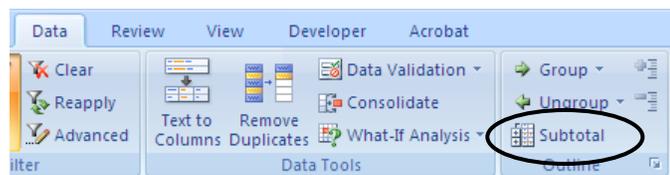
The **syntax** for the SUBTOTAL is: SUBTOTAL(function_num,ref1,ref2,...).

SUBTOTAL requires two things: (1) a range of data (2) type of subtotal. In return, SUBTOTAL will give you the subtotal for that data.

The **function_num** can be any one of 11 different calculations that can be used in calculating subtotals. The **ref1,ref2,..** etc are references to up to 30 ranges you wish to subtotal.

The 11 different calculations that can be used in calculating subtotals and their **function_num** are as below:

Function_Num	Function
1	AVERAGE
2	COUNT
3	COUNTA
4	MAX
5	MIN
6	PRODUCT
7	STDEV
8	STDEVP
9	SUM
10	VAR
11	VARP



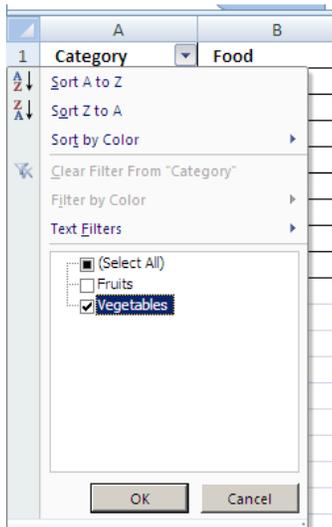
It is important to note that this is **NOT** referring to the Subtotal feature from the **Data** menu.

The SUBTOTAL function is the perfect complement for Auto Filters because the SUBTOTAL function will only include non-filtered (or non-hidden rows) in the range it refers to.

	A	B	C	
1	Category	Food	Sales	
2	Vegetables	Tomatoes	\$2,300.00	
3	Vegetables	Celery	\$5,500.00	
4	Fruits	Oranges	\$800.00	
5	Fruits	Peaches	\$400.00	
6	Vegetables	Carrots	\$4,200.00	
7	Fruits	Apples	\$1,200.00	
8	Vegetables	Asparagus	\$895.00	
9	Fruits	Pear	\$1,232.00	
10				
11			\$16,527.00	=SUM(C2:C9)
12			\$16,527.00	=SUBTOTAL(9,C2:C9)

Both functions are currently returning the same result. But let's apply the filter for Category. We only want to see Vegetables.

Notice the two difference results that the two functions have returned.



	A	B	C	
1	Category	Food	Sales	
2	Vegetables	Tomatoes	\$2,300.00	
3	Vegetables	Celery	\$5,500.00	
4				
5				
6	Vegetables	Carrots	\$4,200.00	
7				
8	Vegetables	Asparagus	\$895.00	
9				
10				
11			\$16,527.00	=SUM(C2:C9)
12			\$12,895.00	=SUBTOTAL(9,C2:C9)

SUBTOTAL function **only** calculated **non-filtered** (or non-hidden rows) in the range it refers to.

There are three very important points to realize with the SUBTOTAL function and they are:

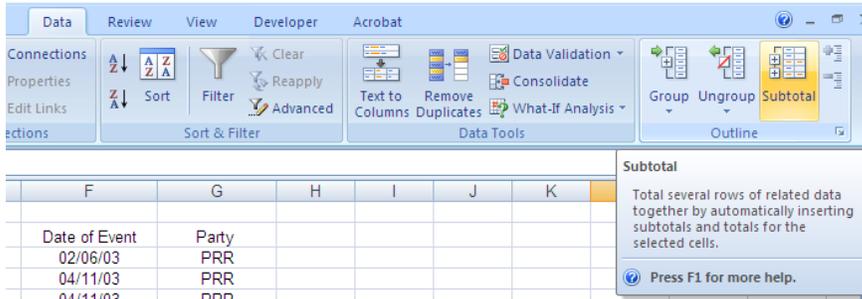
1. SUBTOTAL will only ignore rows that are hidden as the result of the Auto Filter. However, if you hide a row that is part of a filtered range it will ignore it, but only if the Auto Filter is already in use.
2. If there are other SUBTOTAL functions within your reference range(s), their results will be ignored. This prevents any double counting.
3. You cannot use SUBTOTAL on a 3-D reference. (A 3-D reference is a range of cells that spans more than one Worksheet.)

Automatically create SUBTOTALS.

What? Subtotals again? Almost, but this is a little different.

Excel's Subtotal command inserts formulas into a worksheet database automatically. These formulas use the SUBTOTAL function. Your database must be sorted because the formulas are inserted whenever the value in a specified field changes.

Data tab – Subtotal

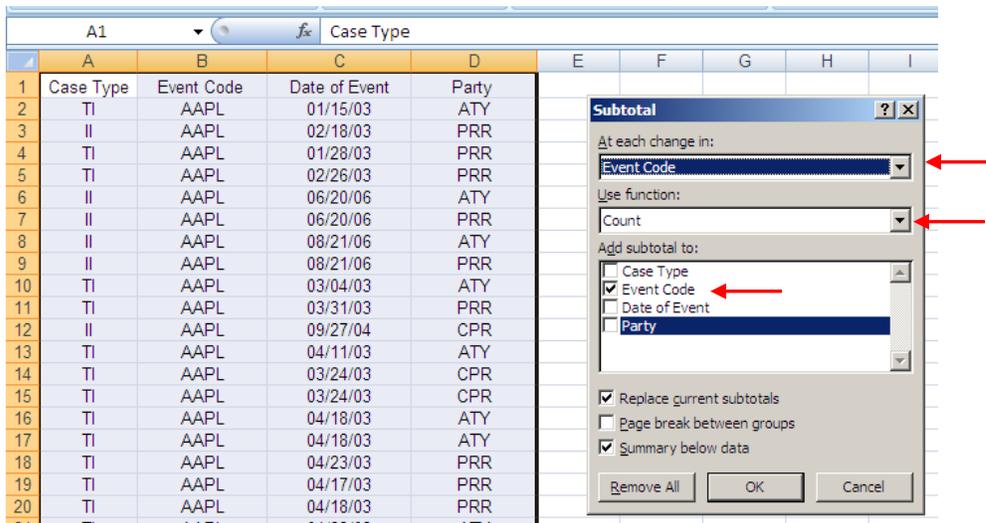


In this example, I want to know how many times different event codes were used. Place the cursor anywhere in the data area, click on Subtotal.

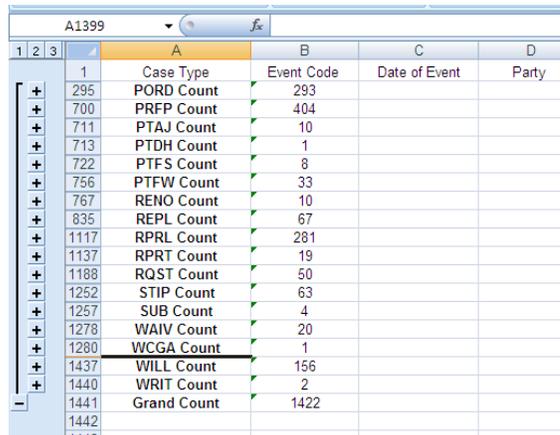


The subtotal dialog box will open and you select your choices.

The COUNT function is being used at every change in Event Code (column B). The subtotals will be added to the Event Code column.



When you click OK, Excel analyzes the data base and inserts formulas as specified and creates an outline.



	A	B	C	D
1	Case Type	Event Code	Date of Event	Party
295	PORD Count	293		
700	PRFP Count	404		
711	PTAJ Count	10		
713	PTDH Count	1		
722	PTFS Count	8		
756	PTFW Count	33		
767	RENO Count	10		
835	REPL Count	67		
1117	RPRL Count	281		
1137	RPRT Count	19		
1188	RQST Count	50		
1252	STIP Count	63		
1257	SUB Count	4		
1278	WAIV Count	20		
1280	WCGA Count	1		
1437	WILL Count	156		
1440	WRIT Count	2		
1441	Grand Count	1422		
1442				

Linking information between worksheets

Excel allows you to link information between cells, worksheets or workbooks. Linking is the easiest and most accurate way of creating summary sheets or pulling required information from different locations without re-entering data. Linking also helps to ensure data accuracy by utilizing Excel's automatic updating and recalculation features.

A cell containing a link to a cell on another worksheet will have the following information in the formula bar: =sheetname!cellref, for example, =Sheet3!C4

To create a link between different worksheets:

1. Place your cursor in the cell you want to pull information into
2. Type the equal sign (=)
3. Click on the sheet tab containing the information you want to link to
4. Click on the cell containing the information you want to link to
5. Hit the Enter key on your keyboard
(you will be returned to the worksheet that you started on only after you hit the Enter key.)

	A	B	C
1	Date	Amount	Description
2	1/3/2012	23.76	FedEx
3	1/4/2012	345.00	Copy Center
4	1/23/2012	56.00	Conoco
5	2/3/2012	98.77	UPS
6	2/15/2012	456.00	Delivery
7	3/3/2012	34.70	FedEx
8	3/12/2012	54.00	Purchase
9	1st Qtr Totals:	1,068.23	
10			
11	4/20/2012	12.00	Purchase
12	5/3/2012	34.55	Conoco
13	5/7/2012	67.80	UPS

B3 fx =Transactions!B9

	A	B	C
1	2012 Sales Summary		
2			
3	1st Qtr	1,068.23	
4	2nd Qtr	148.35	
5	3rd Qtr		
6	4th Qtr		
7			
8			
9			

Transactions Summary

Creating a link between worksheets