VLOOKUP on Two or More Criteria Columns

January 10, 2014   Jeff Lenning   Excel, Functions, Techniques   CONCATENATE, SUMIFS, VLOOKUP

13 comments

If you have ever tried to use a VLOOKUP function with two or more criteria columns, you've quickly discovered that it just wasn't built for that purpose. Fortunately, there is another function that may work as an alternative to VLOOKUP depending on what you want to return.

Multi-Column Lookup Objective

First, let's confirm our objective by looking at a sample workbook. We have exported some information from our accounting system, and it is basically summarizes the transaction totals for the month by class and by account. A sample of the export is shown below:

	A	B	C	D	E
13	Export				
14					
15		Class	Acct	Amount	
16		New Construction	Design Income	3,152	
17		Remodel	Design Income	33,576	
18		Overhead	Design Income	109	
19		New Construction	Labor Income	58,492	
20		Remodel	Labor Income	24,218	
21		Overhead	Labor Income	225	
22		New Construction	Materials Income	68,401	
23		Remodel	Materials Income	51,519	
24		Overhead	Materials Income	351	
25		New Construction	Other Income	299	
26		Remodel	Other Income	179	
27		Overhead	Other Income	425	

From this exported data, we would like to retrieve selected amounts based on the class and account columns. We want to retrieve the amounts and place them into our little report, pictured below:

	A	B	C	D	E
4	Report				
5					
6		Class	Account	Amount	
7		New Construction	Design Income		
8		New Construction	Labor Income		
9		New Construction	Materials Income		
10		New Construction	Other Income		
11					

If you are familiar with the VLOOKUP function, it feels natural to try to build the report with this function because, after all, this is a lookup task. And, lookup tasks are best solved with traditional lookup functions…right? Well, it depends. It depends on what you are trying to retrieve.

Conditional Summing for Lookups

If you are trying to retrieve a numeric value, such as an amount, then a traditional lookup function may not be your best bet. Here's why. Beginning with Excel 2007, Microsoft included the conditional summing function SUMIFS. This multiple condition summing function is designed to add up a column of numbers, and only include rows that meet one or more conditions. Are the dots starting to connect yet?
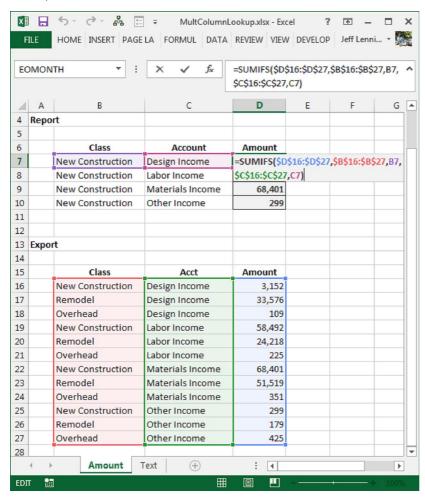
If we apply this idea to our task at hand, we would quickly realize that we could use this conditional summing function to retrieve our report values.

The first argument of the SUMIFS function is the sum range, that is, the column of numbers to add. In our case, the column that has the value we wish to return. The remaining arguments come in pairs: the criteria range and the criteria

value.

It is helpful to think about the function in these terms: add up *this column* (argument 1), only include those rows where *this column* (argument 2) is equal to *this value* (argument 3), and where *this column* (argument 4) is equal to *this value* (argument 5), and where…and so on, up to 127 pairs.

Thus, to populate our report, we'll retrieve the amount values from the export, and match the class and account columns, as shown below.

If there happen to be multiple rows with the same class and accounts, then the SUMIFS function would return the sum of all matching items.

As you can see, if the value you are trying to return is a number, then the SUMIFS function makes it simple to perform multi-column lookups. But, what if the value you are trying to return is not a number? Well, then you'll need to use a traditional lookup function as discussed below.

Using VLOOKUP with SUMIFS Method

One method is to use VLOOKUP and SUMIFS in a single formula. Essentially, you use SUMIFS as the first argument of VLOOKUP. This method is explored fully in this Excel University post:

http://www.excel-university.com/multi-column-lookup-with-vlookup-and-sumifs/

Using VLOOKUP with CONCATENATE Method

If you are trying to return a text string rather than a number, or are using a version of Excel that doesn't have SUMIFS, then you are probably stuck with using a traditional lookup function such as VLOOKUP along with the CONCATENATE function to generate a single unique lookup column. This approach is fairly well documented, but the basic idea goes like this: create a single lookup column first, and then use VLOOKUP.

Our example will be an employee list, as illustrated below:

	C	D	E	F	G
14	Last	First	City	State	Zip
15	Smith	Brandon	Greensbo	NC	27403
16	Smith	Debra	Danbury	CT	6810
17	Cogdell	David	White Lak	NY	12786
18	Ahn	Justin	Atlanta	GA	30303
19	Guerra	Marguerit	Nashville	TN	37217
20	Smith	Willard	Windsor	CA	95492
21	Evans	John	Dallas	TX	75212
22	Regalado	Felicia	New York	NY	10022
23	Bowman	Alexis	Washingt	DC	20005
24	Ofarrell	Lorine	Shrevepo	LA	71101
25	Monzo	Carol	Fort Smith	MT	59035
26	Eaton	Brenda	Kokomo	IN	46901

We need to retrieve the state from the employee list for our little report shown below:

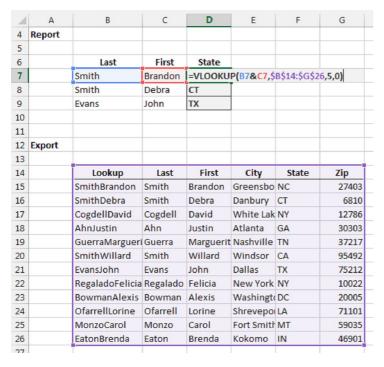|	A	B	C	D	E
4	Report				
5					
6		Last	First	State	
7		Smith	Brandon		
8		Smith	Debra		
9		Evans	John		
10					

Since the value we are trying to return, the state, is a text string and not a number, we are precluded from using the SUMIFS function. Thus, we'll need to go old-school with VLOOKUP and CONCATENATE.

We start by building a helper column that basically creates the combined lookup values. This can easily be accomplished with the CONCATENATE function or the concatenation operator (&). This new lookup column is illustrated in column B below:

B15	▼	:	×	✓	*fx*	=CONCATENATE(C15,D15)

	A	B	C	D	E	F	G
12	Export						
13							
14		Lookup	Last	First	City	State	Zip
15		SmithBrandon	Smith	Brandon	Greensbo	NC	27403
16		SmithDebra	Smith	Debra	Danbury	CT	6810
17		CogdellDavid	Cogdell	David	White Lak	NY	12786
18		AhnJustin	Ahn	Justin	Atlanta	GA	30303
19		GuerraMargueri	Guerra	Marguerit	Nashville	TN	37217
20		SmithWillard	Smith	Willard	Windsor	CA	95492
21		EvansJohn	Evans	John	Dallas	TX	75212
22		RegaladoFelicia	Regalado	Felicia	New York	NY	10022
23		BowmanAlexis	Bowman	Alexis	Washingt	DC	20005
24		OfarrellLorine	Ofarrell	Lorine	Shrevepo	LA	71101
25		MonzoCarol	Monzo	Carol	Fort Smith	MT	59035
26		EatonBrenda	Eaton	Brenda	Kokomo	IN	46901

Now we have a single lookup column that can be used with a traditional lookup function such as VLOOKUP. The report can be populated by looking up the combined names within the new lookup range, as shown below:

	A	B	C	D	E	F	G
4	Report						
5							
6		Last	First	State			
7		Smith	Brandon	=VLOOKUP(B7&C7,$B$14:$G$26,5,0)			
8		Smith	Debra	CT			
9		Evans	John	TX			
10							
11							
12	Export						
13							
14		Lookup	Last	First	City	State	Zip
15		SmithBrandon	Smith	Brandon	Greensbo	NC	27403
16		SmithDebra	Smith	Debra	Danbury	CT	6810
17		CogdellDavid	Cogdell	David	White Lak	NY	12786
18		AhnJustin	Ahn	Justin	Atlanta	GA	30303
19		GuerraMargueri	Guerra	Marguerit	Nashville	TN	37217
20		SmithWillard	Smith	Willard	Windsor	CA	95492
21		EvansJohn	Evans	John	Dallas	TX	75212
22		RegaladoFelicia	Regalado	Felicia	New York	NY	10022
23		BowmanAlexis	Bowman	Alexis	Washingto	DC	20005
24		OfarrellLorine	Ofarrell	Lorine	Shrevepol	LA	71101
25		MonzoCarol	Monzo	Carol	Fort Smith	MT	59035
26		EatonBrenda	Eaton	Brenda	Kokomo	IN	46901
27							

This same approach can be used when two, three, or more lookup columns need to be considered.

Conclusion

In addition to being able to perform multi-column lookups when the return value is numeric, the SUMIFS function has additional benefits when compared to traditional lookup functions. For example, it returns zero when no matching value is found, it returns the sum of all matches, it supports comparison operators, and it won't break when a new column is inserted between the lookup and return columns.

So, when you are about to bust out the VLOOKUP function to do a lookup task, consider using SUMIFS instead. Believe it or not, the SUMIFS function makes a wonderful lookup function.

If you have any other preferred approaches to multi-column lookups, we'd love to hear more…please post a comment below.
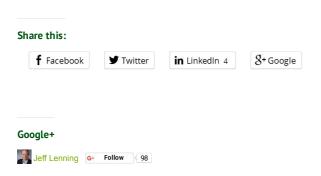
Sample File

If you want to play with the workbook used to generate the screenshots above, please feel free to download the sample file:

MultColumnLookup

Additional Resources

This post is a summary adaption of Excel University Volume 2, Chapter 15 Perform Lookups with SUMIFS. More information available:

› Excel University Volume 2 Book
› Excel University Volume 2 Course

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13 comments:

Natanya
July 16, 2014 at 11:32 pm • Reply

Really helpful, Thanks!

Vijay
September 5, 2014 at 1:34 am • Reply

Thanks a ton.. Very simple and easy to use solution for both numbers and text strings! It helped me solve a problem in minutes Great job guys…

Amy
September 22, 2014 at 9:37 am • Reply

My only issue with this is when one of the columns has more than one word. I can't include any spaces.

Customers Table
A2 (Lookup): CompanyCanadaVancouver
B2 (Account): 1234
C2 (Company): CompanyCanada
D2 (Branch): Vancouver

Contacts Table
A2 (Account): =VLOOKUP([Company]&[Branch],Customers,2,TRUE)
B2 (Company): CompanyCanada
C2 (Branch): Vancouver

It would be nice if I could do this with a space between Company & Canada.

jefflenning `Post author`
October 2, 2014 at 10:07 am • Reply

Amy,

Hmmm…I tried it here with a space between Company & Canada, and it seemed to work. Here are the values I used in my tests:

Customers Table
A2 (Lookup): Company CanadaVancouver
B2 (Account): 1234
C2 (Company): Company Canada
D2 (Branch): Vancouver

Contacts Table
A2 (Account): =VLOOKUP([Company]&[Branch],Customers,2,TRUE)
B2 (Company): Company Canada
C2 (Branch): Vancouver

The VLOOKUP function returned the 1234 value successfully. I'm thinking perhaps it may be a different issue? For example, a common issue is that the export may actually include trailing spaces. If so, you can use TRIM to remove excess spaces. Another idea is that you can concatenate a space into the VLOOKUP function if needed, such as VLOOKUP(A1&" "&A2…).

Also, I'd want to confirm that the values in both tables include, or exclude, the space. For example,

that C2 in the Customers Table has a space (Company Canada) as well as the corresponding value in the Contacts Table (B2, Company Canada).

I hope these ideas are helpful!

Thanks
Jeff

Marc Quinn
October 9, 2014 at 6:02 am • Reply

It's not exactly applicable here but I've found that 'sumifs' can be done without SUMIFS, so to speak.

For Smith sales in NC – using an added fictional Sales column (H) and changing the States so that some are matching (Changing Willard Smith to NC)….

{=SUM(IF(C15:C26=B7,IF(F15:F26=D7,H15:H26,0),0))}

You need Shift&Enter or {} to activate the formula.

jefflenning [Post author]
October 9, 2014 at 7:08 am • Reply

Marc,
Thanks for sharing your array formula alternative!!
Thanks
Jeff

Amanda
December 18, 2014 at 1:21 pm • Reply

How would i do it if i wanted to look up 3 columns?
Example A is the convenate of b&c.
B=Article
C=PO
D=Date
E=QTY

jefflenning [Post author]
December 22, 2014 at 3:54 pm • Reply

If the item you want to return is numeric, then I recommend using SUMIFS and just add another criteria_range/criteria_value pair of arguments. If the item you want to return is a text string, then I recommend using concatenate to combine the lookup columns.
The sample file has example formulas for reference.
Thanks
Jeff

Abhinav Jain
March 9, 2015 at 8:45 am • Reply

Following alternate method is a fantastic way of multi criteria look up; the best one I found.

http://exceltactics.com/vlookup-multiple-criteria-using-index-match/

jefflenning [Post author]
March 12, 2015 at 2:26 pm • Reply

Great post…thanks for sharing!

Wayne Marsland

August 10, 2015 at 3:37 am • Reply

Fantastic – thank-you

Amit
August 24, 2015 at 9:53 pm • Reply

Table No Start date End date Society Name
1 1/7/2015 3/7/2015 ABCD
2 2/7/2015 5/7/2015 PQRS
1 5/7/2015 7/7/2015 ABCD
1 7/7/2015 10/7/2015 XYZ
HI ,

My query is that if i have to develop a vlookup with multiple criteria such that if Table No is 2 and the satart date and End date lies between the mentioned dates then the society name should be pulled out. Can you please help!!

jefflenning   Post author
September 3, 2015 at 8:53 am • Reply

Amit,

Since the SUMIFS function is designed to return a number, and not a name such as the society name ABCD, we can't use it directly…however…we can use it along with a helper column. Here is the basic idea. You create a new helper column in the data range, something like "RecordID" or "ID" which is a unique number for that row, such as 1, 2, 3, 4, and so on. Then, assuming that the conditions can only be met by a single row, you can use the SUMIFS function with multiple conditions to return the RecordID to a cell, say A1. Then, you can use a VLOOKUP that finds the RecordID stored in A1 in the lookup range to return the society name. You could even combine the SUMIFS and VLOOKUP in a single formula with something like this:

=VLOOKUP(SUMIFS(sum_range, criteria_range1, criteria1, …), lookup_table, 5, 0)

Hope this idea helps!

Thanks

Jeff

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