APCO/IASC 1P01 – Laboratory 6

This laboratory exercise builds on the foundation you established last week. If you have not yet completed the first exercise, you'll have to work quickly (and should refer to that lab's sheet). If you wish, you're welcome to make a copy of your work from last week and build upon it for this exercise. As before, once you have completed your tasks, you must have your supervising lab demonstrator verify your work. Complete all tasks as separate worksheets in the same workbook.

Tasks

Our final goal will look very similar to our work from last week, but there are three key differences:

1. Each department will have its own individual sales sheet (virtually identical to what you wrote for last lab, except with people's names)
2. The final goal is a single sheet that summarizes how much each department sold from each category (accessories and foodstuffs), as well as grant totals
3. For both the departmental sheets, and the final tally sheet, you must name a 'winner' (i.e. label the person/department that raised the most money)

See below for a sample:

	A	B	C	D	E	F	G	H	I	J	K	L
1						Physics						
2	Dept	Mousepads	Mugs	Flash Drives	Penguin Beanies	Accessories	Chocolate	Pickled Beets	Fruitcakes	Foodstuffs	Total	Winner
3	R. Sanchez	6	5	1	1	$ 85.50	5	8	1	$ 20.25	$ 105.75	
4	M. Meeseeks	4	8	1	0	$ 86.00	3	3	3	$ 12.75	$ 98.75	
5	T. Gueterman	3	6	1	2	$ 71.00	4	6	2	$ 17.50	$ 88.50	
6	M. Cronenberg	9	1	1	3	$ 89.50	3	10	5	$ 30.25	$ 119.75	
7	C. Figgis	0	6	15	6	$ 87.00	12	7	8	$ 34.00	$ 121.00	*
8	T. Marrow	4	7	2	1	$ 84.50	4	3	6	$ 18.50	$ 103.00	
9	per Unit	$ 8.00	$ 6.50	$ 2.00	$ 3.00		$ 0.50	$ 2.00	$ 1.75			
10	Totals					$ 503.50				$ 133.25	$ 636.75	

	A	B	C	D	E	F	G	H
1	Broccoli University Fundraising Drive							
2	Dept	Accessories	Foodstuffs	Total	Winner			
3	Physics	$ 503.50	$ 133.25	$ 636.75				
4	Mathematics	$ 534.50	$ 114.25	$ 648.75				
5	Computer Science	$ 531.50	$ 137.75	$ 669.25				
6	Biology	$ 562.50	$ 142.25	$ 704.75	*			
7	Chemistry	$ 447.50	$ 144.75	$ 592.25				
8	Earth Sciences	$ 578.00	$ 93.00	$ 671.00				
9	Totals	$ 3,157.50	$ 765.25	$3,922.75				
10								
11								
12								
13								
14								
15								
16								

◄ ► ... | Biology | Computer Science | Mathematics | Physics | **Fundraising** | ⊕

READY

Departmental Sheets

As mentioned above, you're best off basing this on your work from last week. So, assuming you finished that, either load up last week's or make a copy of it to load. (Remember that, if you open the file first, you can always choose *Save As…* to make a working copy under a different filename)

If you still have a sheet for the 'comparison of common social creatures', then you can just delete that part (right-click on its tab, and choose Delete).

Because you'll be using a separate sheet for each department, names like *Sheet1* will not be very useful. Right-click on its tab, click on Rename, and choose something else (e.g. Physics). Change the table's heading (top-most cell) to match.

Fill in some fake names to replace the department names, and we'll be ready for the next step.

	A	B	C	D	E	F	G	H	I	J	K
1	Physics										
2	Dept	Mousepads	Mugs	Flash Drives	Penguin Beanies	Accessories	Chocolate	Pickled Beets	Fruitcakes	Foodstuffs	Total
3	R. Sanchez	6	5	1	1	$ 85.50	5	8	1	$ 20.25	$ 105.75
4	M. Meeseeks	4	8	1	0	$ 86.00	3	3	3	$ 12.75	$ 98.75
5	T. Gueterman	3	6	1	2	$ 71.00	4	6	2	$ 17.50	$ 88.50
6	M. Cronenberg	9	1	1	3	$ 89.50	3	10	5	$ 30.25	$ 119.75
7	C. Figgis	0	6	15	6	$ 87.00	12	7	8	$ 34.00	$ 121.00
8	T. Marrow	4	7	2	1	$ 84.50	4	3	6	$ 18.50	$ 103.00
9	per Unit	$ 8.00	$ 6.50	$ 2.00	$ 3.00		$ 0.50	$ 2.00	$ 1.75		
10	Totals					$ 503.50				$ 133.25	$ 636.75
11											
12											
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23											

Physics ⊕

READY

We need one more column, to indicate the winner. Hypothetically, we could just use *Conditional Formatting* to do that, but that's part of next week's lab. So, instead, we'll just use a couple of simple functions to generate a symbol beside the winner.

But let's build up to that, shall we?

Temporary Experiment

There are two components to naming a winner: finding out what the highest total is, and finding out which line corresponds to that highest total.

(For comparison, if we were just talking about it informally, we might be tempted to say that we're looking for whomever sold more than the rest, but that's actually a far more complicated phrasing)

First, let's find out what the highest amount sold was. Select some empty cell, and (for this example) type:

`=MAX(K3:K8)`

(Again, Excel isn't case-sensitive, so you don't need to bother capitalizing if you prefer not to)

If you used the same values and indices as me, then you'll see the number 121 (or $121.00, etc.).

Next, we want to know if a given cell contains 121, so, select cell L3 (the first blank next to R. Sanchez's total), and enter:

=IF(K3=121, "*","")

The 'if' function is for conditionally returning one of two values/expressions, depending on some test.

'K3=121' asks, "do the contents of cell K3 match the value 121?"

If the answer to that question is 'yes' (true), then the function returns the second term, "*". (The quotation marks simply tell Excel that you're putting in text, and not trying for a multiplication symbol)

If the answer had been 'no' (false), then the function would have returned the final term, "". Since that means it would return text, but there'd be nothing inside the text, that's just how we tell Excel that a cell should 'stay empty'.

So, that would work. And, if we wanted to do it that way, we could simply *hide* whatever row/column we put that initial MAX formula in. But we don't need to do that. We don't need an intermediate value like that.

Actual Approach

Instead, try this:

Select cell L3, and enter:

=IF(K3=MAX(K3:K8),"*","")

When you hit the Enter key, it might initially seem as though it didn't work. However, was 105.75 actually the highest amount sold? If not, then we're telling it to leave it blank (which it does). Try temporarily increasing the number of mousepads he sold to verify that, yes, it does indeed show an asterisk when he won.

So, next we want to extend that to the rest of them in the column, right? Ah, but we should know from last week that the formula still isn't *quite* right. If you try extending that formula downwards, then the K3 will correctly translate to K4, K5, etc., but the range for the MAX function will shift as well.

That means we actually need the formula:

=IF(K3=MAX(K$3:K$8),"*","")

That formula can be correctly extended downwards. (So you should do that)

Add a 'Winner' heading, maybe re-Merge&Center the table's heading, change the cell style, and you've completed the first task.

|	A	B	C	D	E	F	G	H	I	J	K	L
1						Physics						
2	Dept	Mousepads	Mugs	Flash Drives	Penguin Beanies	Accessories	Chocolate	Pickled Beets	Fruitcakes	Foodstuffs	Total	Winner
3	R. Sanchez	6	5	1	1	$ 85.50	5	8	1	$ 20.25	$ 105.75	
4	M. Meeseeks	4	8	1	0	$ 86.00	3	3	3	$ 12.75	$ 98.75	
5	T. Gueterman	3	6	1	2	$ 71.00	4	6	2	$ 17.50	$ 88.50	
6	M. Cronenberg	9	1	1	3	$ 89.50	3	10	5	$ 30.25	$ 119.75	
7	C. Figgis	0	6	15	6	$ 87.00	12	7	8	$ 34.00	$ 121.00	*
8	T. Marrow	4	7	2	1	$ 84.50	4	3	6	$ 18.50	$ 103.00	
9	per Unit	$ 8.00	$ 6.50	$ 2.00	$ 3.00		$ 0.50	$ 2.00	$ 1.75			
10	Totals					$ 503.50				$ 133.25	$ 636.75	

However, we'll still be using this page to complete the larger task at hand.

Summary of Totals

In order to make a single summary of how all of the departments did, we'll first need to do a bit of extra work.

First and foremost, we need more than one department. We'll be using one Worksheet per department. If you wanted, you could start each sheet from scratch, but that really isn't necessary. Instead, just right-click on the *Physics* tab, and choose *Move or Copy….*

In the dialog that appears, select the *Create a copy* checkbox. It doesn't really matter whether the new sheet comes before *Physics*, or after. Afterwards, right-click on the new tab, and rename it (e.g. *Mathematics*).
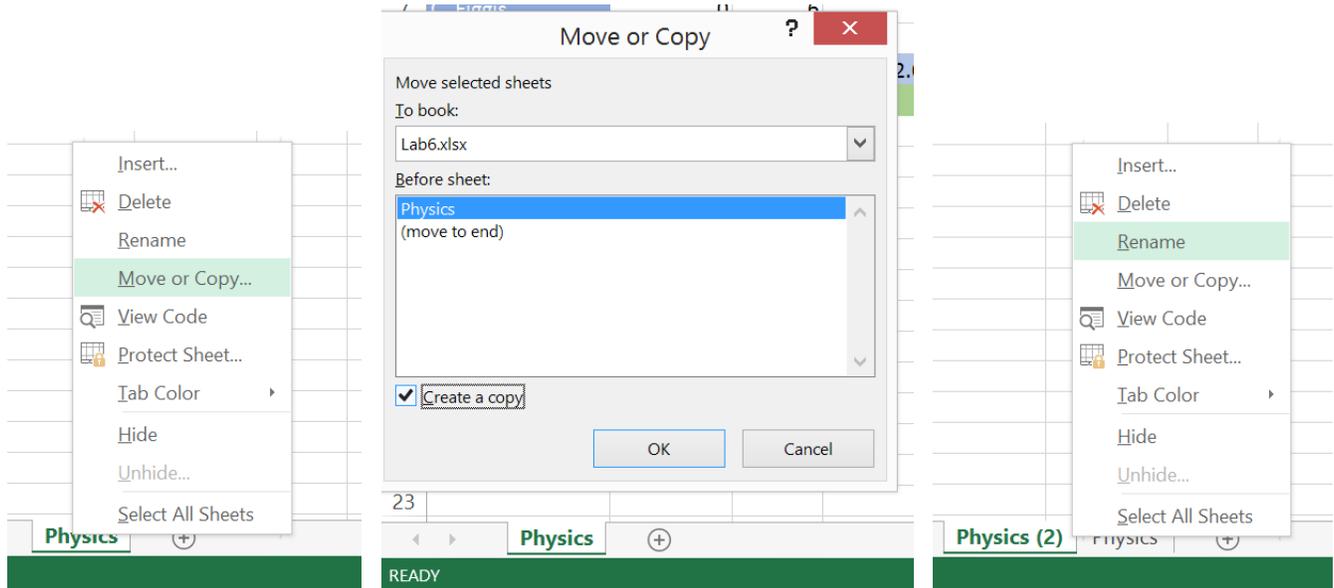
Populate the new sheet with additional fake names and data. (Of course, you could actually keep the same names, if you want; just make sure that the numbers of items sold have changed, so that there'll be a purpose in summarizing all of the sheets)

	A	B	C	D	E	F	G	H	I	J	K	L	M
1						Mathematics							
2	Dept	Mousepads	Mugs	Flash Drives	Penguin Beanies	Accessories	Chocolate	Pickled Beets	Fruitcakes	Foodstuffs	Total	Winner	
3	Petyr	3	2	6	2	$ 55.00	4	5	7	$ 24.25	$ 79.25		
4	Tywin	2	8	4	0	$ 76.00	3	2	5	$ 14.25	$ 90.25		
5	Viserys	8	4	6	2	$ 108.00	5	5	3	$ 17.75	$ 125.75		
6	Robert	7	8	4	3	$ 125.00	5	3	4	$ 15.50	$ 140.50	*	
7	Cersei	3	5	8	6	$ 90.50	3	8	2	$ 21.00	$ 111.50		
8	Trask	4	6	3	1	$ 80.00	9	5	4	$ 21.50	$ 101.50		
9	per Unit	$ 8.00	$ 6.50	$ 2.00	$ 3.00		$ 0.50	$ 2.00	$ 1.75				
10	Totals					$ 534.50				$ 114.25	$ 648.75		
11													
12													
13													
14													

Repeat until you have 5 or 6 departments (again, you don't actually have to change the names. Just make sure that each department has a different grand total).

Starting the Summary Page

Make one more worksheet. Style the cells, including *Accounting* Number Format. This one will be relatively simple:
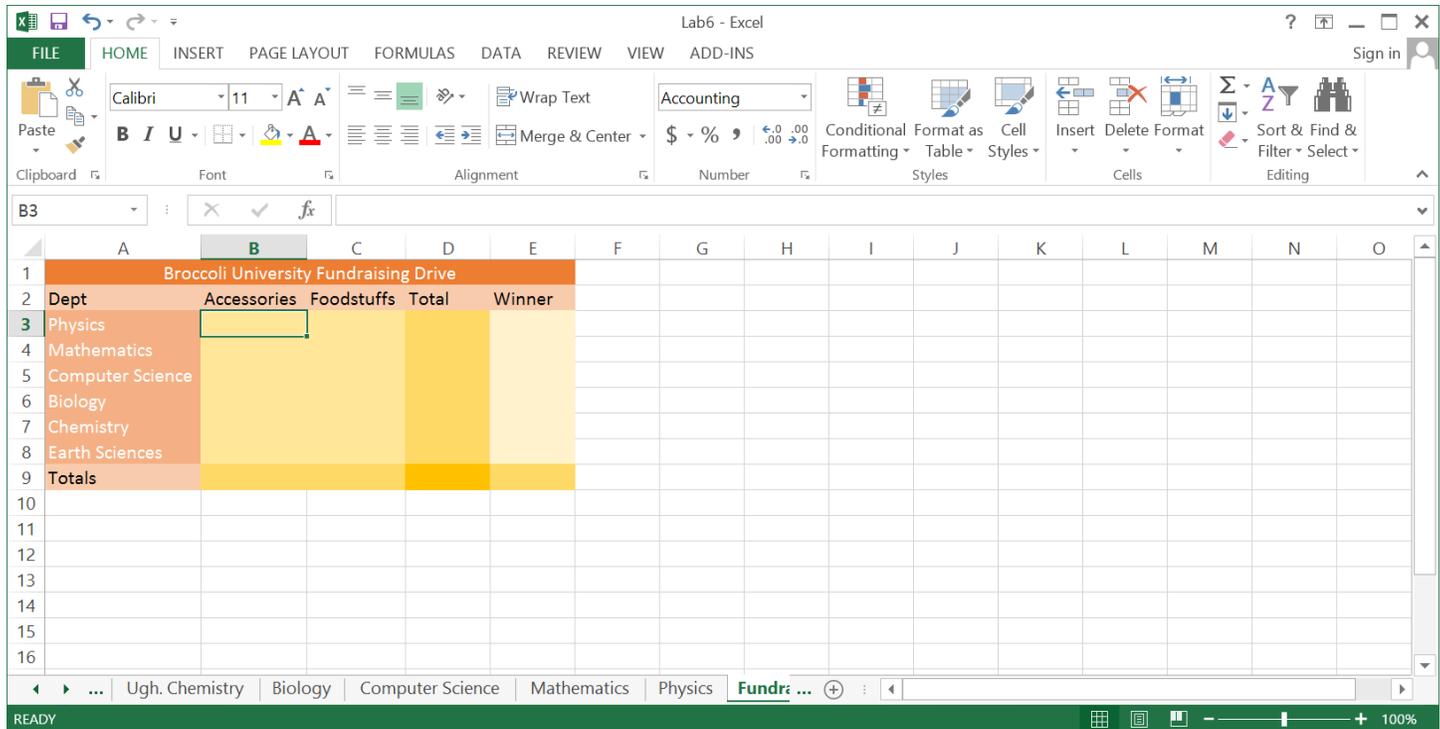
The Accessories total from, for example, the Physics tab has already been calculated.

If we wanted, we could try:

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=Physics!F10
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You should remember from lecture that the ! symbol is how we indicate that we're indexing a cell on another worksheet. However, that F10 isn't very convenient.

Remember the *Name Box*? (The box that shows which cell you currently have selected, towards the left of the Formula Bar) Well, that's not just for cell indices. It can also be used for cell *Labels*.

You *could* (but *don't*) select the Accessories total's cell on the Physics tab, click on the Name Box, and type in *Accessories*. However, if you add a Label that way, you'll create it with a Workbook *scope*. This means you could directly access that cell from any other Worksheet in the Workbook by simply typing Accessories, but it would also mean that you could only have one cell with that name across the entire Workbook.

Problem is, we want to have 6 different Accessories cells. To achieve this, we'll define a Label with a Worksheet scope.

Defining Names and the Name Manager

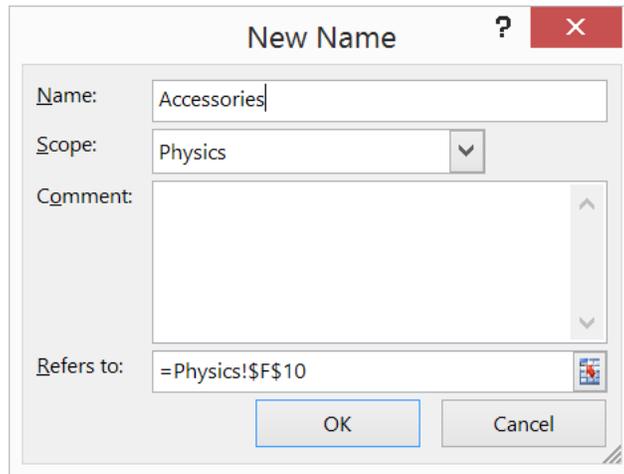Go to the Physics tab, and select the Total cell for Accessories (in this example, F10).

On the Tool Ribbon, select the *Formulas* tab.
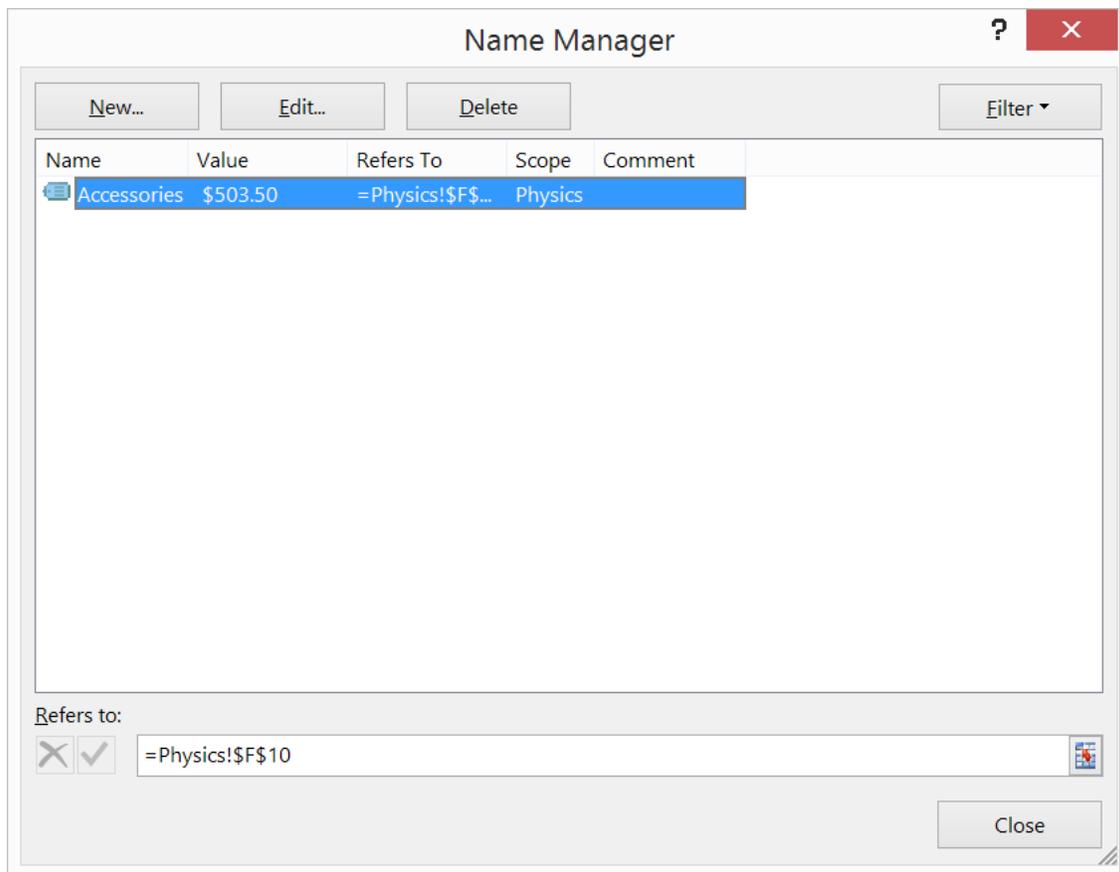
Click on *Define Name*.

In the dialog that appears, beside *Scope*, choose *Physics* (the name of this Worksheet). Choose a name of *Accessories*.

(Note that, beside *Refers To*, it says =Physics!F10)

Click OK.

We *could* try using this right away, but first let's look at the *Name Manager*. It's in the Tool Ribbon, also under the *Formulas* tab.


The Name Manager is for reviewing, changing, adding, or deleting labels.

Note that, if you wish, you can also define a *comment* for each label. This comment will display when you're typing in the label as part of a formula.

So, let's define all the rest of the labels we need: Accessories and Foodstuffs totals from all departmental Worksheets. You can also include departmental Totals as well, if you prefer, but I'll just be recalculating it on the summary page.

Also note that, if you're indexing a cell on a Worksheet that has a name containing a space, it uses single-quotes to encapsulate the Worksheet's name (so it knows both words are part of the same name).

Once all of that is done, it's time to return to the Summary page and start using those Labels.
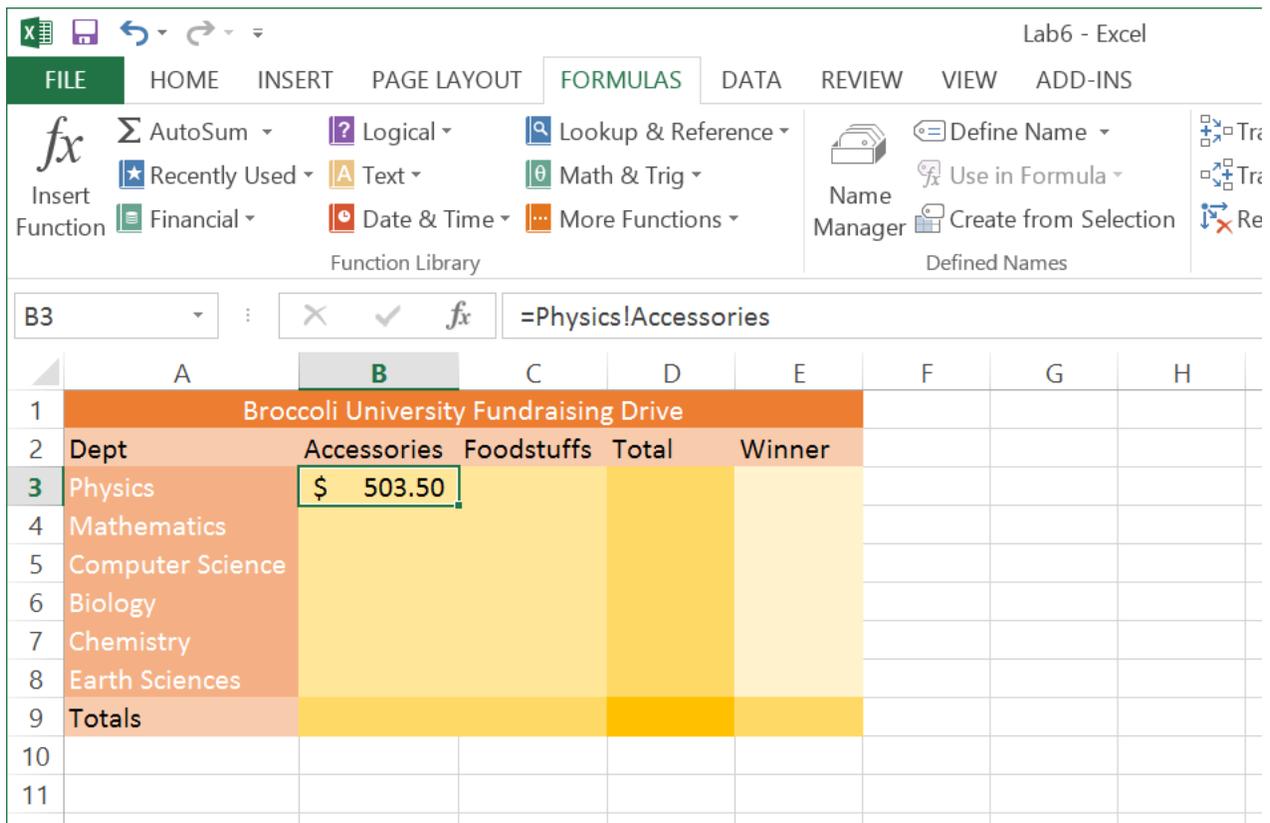
Filling in all of the other cells shouldn't take too long.

After you complete that, sum up the totals.

On a final note, I don't actually care whether you really do reuse the same Label names (e.g. *Accessories*), and carefully assign the scope of each one, or if you just use unique names (e.g. *PhysicsAccessories*). The only reason it's written that way above is so that you'll have the necessary steps should you choose to do it that way.

Submission

All you need do to demonstrate completion is to show your TA that changing the number of items sold on one of the departmental pages can indeed change which department won overall.