The Advanced Budget Project — Part D
The Budget Report

A budget is probably the most important spreadsheet you can create. A good budget will keep you focused on your ultimate financial goal and help you avoid pitfalls like that adorable timeshare on Aruba.

Now we are at the last part of our four-part Advanced Budget Project for Microsoft Excel 2016 on Windows. This is the crucial part where we find out how we are doing relative to our budget. In the first three parts, we created the Budget itself, a Ledger to keep track of our expenditures, and a Pivot Table to summarize our actual expenditures.

In this part, we will set up the all-important Budget Report, that is, a comparison of budgeted versus actual expenses. After going through the trouble of recording all of our expenses, this Budget Report will tell us if we are on budget or not. The pivot table we created in the last part already gives us a good summary of our expenditures. Ideally, we would like to insert some columns into the pivot table where we could display the budget estimates right next the actual expenses. Unfortunately, pivot tables are too inflexible for this. We could copy the pivot table values into a second table that would be more flexible, but this starts getting complicated real fast. Fortunately, there is much more direct way.

If we want to compare our actual expenditures with our budget, we need to summarize our actual amounts, and the best way to do that is with an Excel function called SUMIFS. You may already be familiar with the SUMIF function, which is handy for adding up numbers that meet a certain condition. And yes, if all we wanted was to find the total expenses in each category and did not care about the month, the simple SUMIF function would be fine.

But for our summary, we want to add up the expenses based on *two* conditions, Category and Month. For example, we want to see the total Groceries expenses for each individual month: Jan, Feb, and Mar. The SUMIFS function is perfect for this. Unlike the simple SUMIF function, it can add up items according to any number of different conditions. And unlike the pivot table, the SUMIFS function updates itself automatically. Think of that last "S" in SUMIFS as standing for "Super".

Because of space considerations, we will do a Budget Report only for the first quarter of the year. The procedures for the other quarters are exactly the same.

As mentioned above, this project was done using Excel 2016 (updated by Office 365) running on Windows 10. Most if not all aspects of this project can be performed on other versions of Excel, but the exact instructions may differ.

Skills Used:

- The SUMIFS function
- Linking cells to other sheets using a formatted table
- Conditional Formatting
- Cell Styles

Procedure:

Open the Spreadsheet:

- If it is not open already, open the file: advbudget.xlsx
- Go to the **1Q Report** sheet.

Set up the Report Worksheet.

All we have in the **1Q Report** are a few labels in rows 9 and 10. The first thing we need to do is to add the budget categories to column A. Instead of copying and pasting the categories from the Budget sheet, we'll use a formula to link the cells to the Budget sheet. And, because we used a formatted Excel table on our Budget sheet, we can use meaningful range names in our formulas rather than cryptic explicit references such as "'Budget 2'!A11". Note, however, that for these formulas to work, the items in the budget report sheet have to be on the same rows as they are in the Budget sheet. (That explains why the mystery of why there are so many empty rows above our budget report.)

- Click cell **A11**.
- Type: **=ex**
- In the drop-down list, double-click **ExpBudget2**
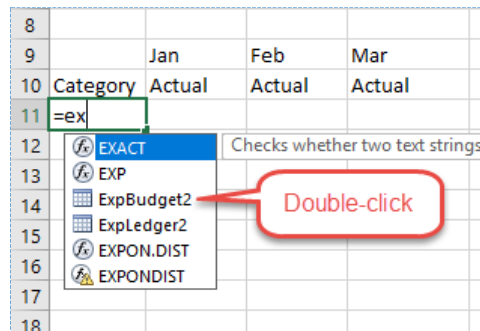
- Type: **[c**
- In the drop-down list, **Category** should be selected.
- Press: **Tab**
  *Note that you can select an item in a drop-down list either by double-clicking it, or single-clicking it and pressing the **Tab** key.*
- Type: **]**
  o The formula should be: **=ExpBudget2[Category]**
- Press: **Enter**
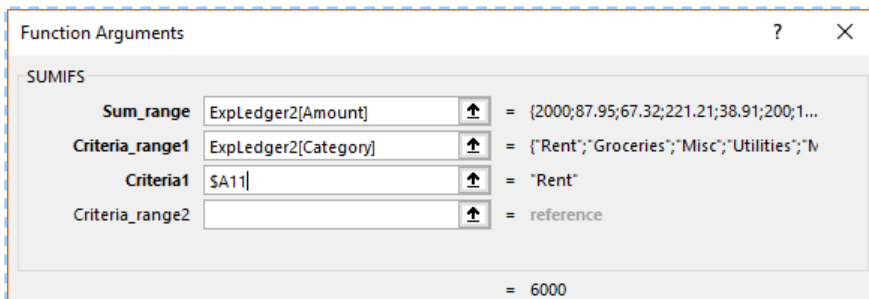- Copy the contents of **A11** to cells **A12** through **A17**.

Note that the formula in each of the cells A11:A17 is the same. Excel determines which label to put in a cell by examining the formula's row number and finding the same row in the Budget sheet..

Use the SUMIFS Function to Add up Expenses for Each Category.

Now we need to get a summary of our actual expenses from our Ledger sheet. In the previous section of this project, we used a Pivot Table to do this. The Pivot Table was quick to set up, but not flexible enough for our budget report. So, instead of a Pivot Table we will use the SUMIFS function, a super powerful relative of the SUMIF function.

Let's ease into the SUMIFS function. This powerful function can add up amounts based on several criteria. But in our first test run with it, we will use only one criterion.

- Click cell **B11**.
- Type: **=sum**
- In the list of functions that appears, double-click **SUMIFS**.
- Click the **Insert Function** button (*fx*).
- Click the box **Sum_range**.
- Click the tab **Ledger 2**.
- Select all the cells in the **Amount** column, excluding the column header.
    - Shortcut: Click the first cell. Then press **Ctrl + Shift + ▼** (the down arrow key).
- Click the box **Criteria_range1**.
- Click the tab **Ledger 2**.
- Select all the cells in the Category column, again excluding the column header.
- Click the box **Criteria1**.
- In the Report sheet, click cell **A11**.
- Press the function key **F4** three times to insert a **$** in front of the **A** (as in **$A6**).

Function Arguments		? ✕
SUMIFS		
Sum_range	ExpLedger2[Amount] ↑	= {2000;87.95;67.32;221.21;38.91;200;1...
Criteria_range1	ExpLedger2[Category] ↑	= {"Rent";"Groceries";"Misc";"Utilities";"N
Criteria1	$A11 ↑	= "Rent"
Criteria_range2	↑	= reference
		= 6000

- Click **OK**.
    - The formula should be:
        =SUMIFS(ExpLedger2[Amount], ExpLedger2[Category], $A11)
- Click and drag down the fill handle of cell **B11** to fill the other cells in the column down to **B17**.

8				
9		Jan	Feb	Mar
10	Category	Actual	Actual	Actual
11	Rent	12045		
12	Auto Loan	900		
13	Utilities	631.64		
14	Groceries	916.61		
15	TV	459		
16	Savings	650		
17	Misc	813.8		
18				

*The **Jan** column now shows total actual expenses for each category — and for **all** months.*

Modify the SUMIFS Function to Add up Expenses for Each Category *and* Each Month:

As you can see, the SUMIFS function in the Jan column does a good job of adding up the expenses for *all* the months. Now let's adjust the function so that it adds up the expenses only for Jan.

- Click cell **B11**.
- Click the **Insert Function** button (*fx*).
- Click the box **Criteria1**.
- A new optional box will appear.
- Click the box **Criteria_range2**.
- Click the tab **Ledger 2**.
- Select all the cells in the **Month** column, excluding the column header.
    - Shortcut: Click the first cell. Then press **Ctrl + Shift + ▼** (the down arrow key).
- Click the box **Criteria1**.
- In the **1Q Report** sheet, click cell **B10**.
- Press the function key **F4** twice to insert a **$** in front of the **4** (as in **B$10**).

- Click **OK**
    - The formula should be:
      =SUMIFS(ExpLedger2[Amount], ExpLedger2[Category], $A11, ExpLedger2[Month], B$9)
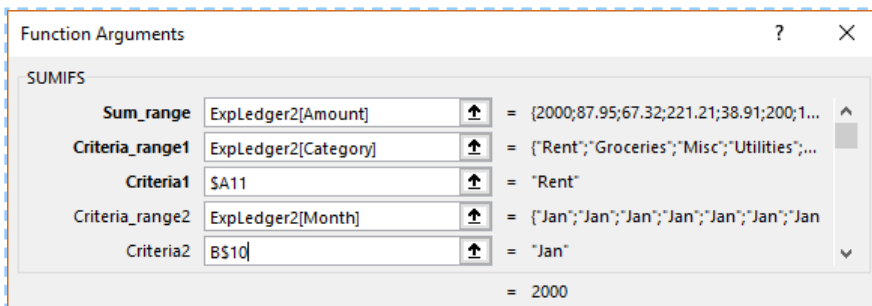- Click and drag down the fill handle of cell **B11** to fill the other cells in the column.
- The **Jan** column now shows the summary of expenses for January.
- Copy the formulas in the **Jan** column and Paste them into the **Feb** and **Mar** columns.
    - *Important Note*: Do NOT use the **Fill** button to copy the formulas to the other months. If you do, the cell references in the **Ledger 2** formatted table will shift to the right and will point to the wrong columns. Instead, if you copy and paste the formulas, the cell references will act as absolute references and will continue to point to the correct columns.

8				
9		Jan	Feb	Mar
10	Category	Actual	Actual	Actual
11	Rent	2001	2003	2005
12	Auto Loan	300	300	300
13	Utilities	221.21	198.45	211.98
14	Groceries	303.72	202.51	410.38
15	TV	151	153	155
16	Savings	200	250	200
17	Misc	106.23	226.34	481.23
18				

Note that in the dummy data in this project I used slightly different amounts. See the Rent and TV categories, which would normally be constant for each month. This makes it easy to check that the right data is going into the right cells.

Link in the Budget Amounts for Comparison with the Actual Expenses:

Just as we did with a Pivot Table in the last part of this project, we now have a summary of expenses broken down by both Category and Month. But, with the SIMIFS function, we now have two advantages over a Pivot Table: First, the formulas update automatically as soon as the data in the Ledger changes. And second, we can now shift the columns so that we can easily compare the Actual expenses with the Budget for each month.

But first we have to bring in the budget amounts. Again, we are going to use a nice feature of formatted tables that makes it easy to link cells in one worksheet with similar cells in another worksheet. A while back we used this technique to import the Category labels from the Budget table. Now we will import the numbers. And, as we shall see later, this feature will also make it easy to modify our report so that a copy of it can be quickly modified for the second quarter (and third and fourth as well).

- Select cells **B9:D9**.
- To copy the cells, press: **Ctrl + C**
- Select cell **E9**
- Paste the cells by pressing: **Ctrl + V**
- Click cell **E10**.
- Type: **Budget**
- To enter the label without shifting to another cell, press **Ctrl + Enter**
- Copy cell **E10**.
- Select cells **D10:E11**.
- Paste the cells by pressing: **Ctrl + V**
- Click cell **E11**.
- Type: **=ex**
- In the drop-down list, double-click **ExpBudget2**
- Type: **[** and then **j**
- In the drop-down list, **Jan** should be selected.
- Press: **Tab**
- Type: **]**
  - The formula should be: **=ExpBudget2[Jan]**
- To copy the formula to the other cells in the column, double-click the Fill handle.
- Copy cells **E11:E17**.
- Select cells **F11:G11**

- Paste the cells by pressing **Ctrl + V**.
- Format the numbers by selecting cells **B11:G17**.
- Click the **Comma** button.
- Remove the decimal places by clicking the **Decrease Decimal** button twice.

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9		Jan	Feb	Mar	Jan	Feb	Mar
10	Category	Actual	Actual	Actual	Budget	Budget	Budget
11	Rent	2,001	2,003	2,005	2,002	2,002	2,002
12	Auto Loan	300	300	300	300	300	300
13	Utilities	221	198	212	250	250	250
14	Groceries	304	203	410	900	900	900
15	TV	151	153	155	152	152	152
16	Savings	200	250	200	202	202	202
17	Misc	106	226	481	250	250	250
18							

Now we can move the Budget cells close to their respective Actual cells. There are two ways we can move the cells: The first way involves holding down the Shift key.

- Select cells **E9:E17**.
- Hold down the **Shift** key.
- Move the pointer over the left border of the selected range of cells until the pointer becomes a four-way arrow.

- Click and hold the left mouse button and drag the pointer to the left until a thick vertical line appears between columns **B** and **C**.

- Release the mouse button.

The Jan Budget cells will move to the right of the Jan Actual cells. Now let's try the second method, which involves the right mouse button and is a little easier:

- Select cells **F9:F17**.
- Cut the cells by pressing **Ctrl + X**
- Right-click cell **D9**.
- Choose: **Insert Cut Cells**

8							
9		Jan	Jan	Feb	Feb	Mar	Mar
10	Category	Actual	Budget	Actual	Budget	Actual	Budget
11	Rent	2,001	2,002	2,003	2,004	2,005	2,006
12	Auto Loan	300	300	300	300	300	300
13	Utilities	221	250	198	250	212	250
14	Groceries	304	900	203	900	410	900
15	TV	151	152	153	154	155	156
16	Savings	200	202	250	202	200	202
17	Misc	106	250	226	250	481	400
18							

Note that green error flags may appear, but these will soon disappear when Excel realizes what we are trying to do. Also note how the dummy data in the Budget and Ledger sheets makes it easy to see that the amounts are going into the proper cells for the Rent and TV categories.

Compare Actual and Budget Amounts with a Percentage:

With the Budget and Actual amounts right next to each other, it is easy to compare the two. To make it even easier still, we should calculate the Actual amounts as a percent of Budget. And for the icing on the cake, we will use Conditional Formatting to highlight any categories over budget. But first, we'll need to insert two more columns inside our table.

- Right-click the column label **F**.
- Choose: **Insert**.
- Right-click the column label **D**.
- Choose: **Insert**
- Click cell **D10**.
- Enter: **% of Budget**
- Click cell **D11**.
- Enter the formula: **=B11/C11**
- Copy the formula to cells **D12:D17**
- Select cells **D11:D17**.
- Click the **Percent Style** button (**%**).

Highlight Over-Budget Categories with Conditional Formatting:

Now let's use Conditional Formatting to point out the over-budget items.

- With **D11:D17** selected, click: **Conditional Formatting**
- Choose: **Highlight Cell Rules** > **Greater Than …**
- In the GREATER THAN box, type **100%**
- Click the arrow to the right of the format box ("Light red fill …").
- Choose: **More Formats…**
- Choose a style of **Bold**.
- Choose the Standard Color: **Dark Red**.
- Select cells **D10:D17**.

- Copy the selected cells.
- Click cell **G10**.
- Paste the cells.
- Click cell **J10**.
- Paste the cells.

9		Jan	Jan		Feb	Feb		Mar	Mar	
10	Category	Actual	Budget	% of Budg	Actual	Budget	% of Budg	Actual	Budget	% of Budget
11	Rent	2,001	2,002	100%	2,003	2,004	100%	2,005	2,006	100%
12	Auto Loan	300	300	100%	300	300	100%	300	300	100%
13	Utilities	221	250	88%	198	250	79%	212	250	85%
14	Groceries	304	900	34%	203	900	23%	410	900	46%
15	TV	151	152	99%	153	154	99%	155	156	99%
16	Savings	200	202	99%	250	202	124%	200	202	99%
17	Misc	106	250	42%	226	250	91%	481	400	120%
18										

Calculate Monthly Totals with the SUM Function:

Of course, it would be a good idea to use the SUM function to analyze the months as a whole:

- Click cell **A18**.
- Enter: **Total**
- Select cells **B18:C18**
- Click: **Home** > **Sum** (**Σ**)
- Copy cell: **D17**
- Paste into cell: **D18**
- Copy cells: **B18:D18**.
- Paste into cells: **E18:J18**.

15	TV	151	152	99%	153	154	99%	155	156	99%
16	Savings	200	202	99%	250	202	124%	200	202	99%
17	Misc	106	250	42%	226	250	91%	481	400	120%
18	Total	3,283	4,056	81%	3,333	4,060	82%	3,764	4,214	89%
19										

Format the Column Headings with a Cell Style:

Now let's fix up our Budget Report so that it looks nice. First, we'll fix up the Month labels and format the column headings:

- Select cells: **B9:D9.**
- Click: **Merge & Center**
- Click OK to confirm overwriting the label in **C9**.
- Select cells: **E9:G9.**
- Press the **F4** function key to repeat the previous action.
- Click **OK** to confirm overwriting the label in **C9**.
- Repeat the above for cells: **H9:J9.**
- Select cells: **A9:J10**.
- Click: **Home** > **Cell Styles**
  - On some large screens, the **Cells Styles** button will not appear. Instead, click the **More** button (▾) at the right of the Styles group to show the Styles gallery.
- Choose: **Accent 1** (usually white text on a dark blue fill color).
- With the cells still selected, click the **Bold** button.

- Widen the columns as needed to show the labels completely.
- Center the text in cells **B10:J10**.
- Select cells **B9:D10**.
- Click the arrow to the right of the **Borders** button.
- In the drop-down menu, choose: **More Borders…**
- In the dialog box under Style, select a medium thick solid line.
- Under Color, choose a very light gray.
- Under Border, click the buttons to apply the border to the right and left sides of the selected cells.
- Select cells **H9:J10.**
- Press the **F4** function key to repeat the above.

	Category	Actual	Budget	% of Budget	Actual	Budget	% of Budget	Actual	Budget	% of Budget
8										
9			Jan			Feb			Mar	
10	Category	Actual	Budget	% of Budget	Actual	Budget	% of Budget	Actual	Budget	% of Budget
11	Rent	2,001	2,002	100%	2,003	2,004	100%	2,005	2,006	100%
12	Auto Loan	300	300	100%	300	300	100%	300	300	100%
13	Utilities	221	250	88%	198	250	79%	212	250	85%

Apply Banded Rows with Conditional Formatting

Note that we cannot simply use the Format as Table feature for this report. That feature requires all column headings to be unique, and our report repeats the labels Actual and Budget. But, we can use a special Condtional Formatting trick to make our table look like a formatted table. But first, let's fix up the Total row.

- Select cells **A18:J18**.
- Click: **Cell Styles**
   - Or, click the **More** button in the Styles group.
- Choose the style: **Total**
- Select cells: **A11:J17**.
- Click: **Conditional Formatting**
- Click: **New Rule**
- Click: **Use a formula to determine which cells to format**
- Click in the box under **Format** cells where this formula is true:
- Type: **= mod(row(), 2)**
   - This uses the MOD function to select the rows with a number not easily divided by 2; in other words, it selects every other row.
- Click the **Format** button.
- Click the **Fill** tab at the top.
- Choose a light blue color.
- Click **OK** twice.

	Jan			Feb			Mar		
10 Category	Actual	Budget	% of Budget	Actual	Budget	% of Budget	Actual	Budget	% of Budget
11 Rent	2,001	2,002	100%	2,003	2,004	100%	2,005	2,006	100%
12 Auto Loan	300	300	100%	300	300	100%	300	300	100%
13 Utilities	221	250	88%	198	250	79%	212	250	85%
14 Groceries	304	900	34%	203	900	23%	410	900	46%
15 TV	151	152	99%	153	154	99%	155	156	99%
16 Savings	200	202	99%	250	202	124%	200	202	99%
17 Misc	106	250	42%	226	250	91%	481	400	120%
18 Total	3,283	4,056	81%	3,333	4,060	82%	3,764	4,214	89%

Create a Summary for the First Quarter:

Now that we have analyzed our Budget vs. Actual results for three months, it would be a simple task to have a summary for the whole quarter as well.

- Copy cells: **H9:J18**.
- Paste into cell **K9**.
- Select cell **K9**.
- Enter: **First Quarter**
- In cell **K11** enter the formula: **=sum(B11, E11, H11)**
- Use the **Fill Handle** to copy the formula to the rest of the cells in the column, excluding the Total cell.
- Copy the formulas in the **K** column to the **L** column.
- Copy cells **J11:J18** to cell **M11**.
- Widen column **M** as needed.

	Jan			Feb			Mar			First Quarter		
10 Category	Actual	Budget	% of Budget	Actual	Budget	% of Budget	Actual	Budget	% of Budget	Actual	Budget	% of Budget
11 Rent	2,001	2,002	100%	2,003	2,004	100%	2,005	2,006	100%	6,009	6,012	100%
12 Auto Loan	300	300	100%	300	300	100%	300	300	100%	900	900	100%
13 Utilities	221	250	88%	198	250	79%	212	250	85%	632	750	84%
14 Groceries	304	900	34%	203	900	23%	410	900	46%	917	2,700	34%
15 TV	151	152	99%	153	154	99%	155	156	99%	459	462	99%
16 Savings	200	202	99%	250	202	124%	200	202	99%	650	606	107%
17 Misc	106	250	42%	226	250	91%	481	400	120%	814	900	90%
18 Total	3,283	4,056	81%	3,333	4,060	82%	3,764	4,214	89%	10,380	12,330	84%

A Warning About Deleting Rows

Someone may see all those empty rows above the Budget Report and decide to delete a few. If that happens, the row numbers on the Budget Report will no longer correspond with those in the Budget sheet, and the Budget amounts in the table will be altered. The safe way to reduce the white space above the table is to Hide the rows rather than deleting them.

It might be a very good idea to put a notice below the Budget Report:

> **Warning:** Deleting rows above or inside the table will disrupt links with the Budget sheet.

Create a Budget Report for the Second Quarter:

Wait! Don't go yet. This is much easier than it sounds.

- First, we can make a copy of the **1Q Report** and rename it **2Q Report**.

- Second, because our formulas refer to the month names Jan, Feb, and Mar instead of explicit cell references, all we need to do is use the Replace tool to replace all instances of **First** with **Second**, **Jan** with **Apr**, **Feb** with **May**, and **Mar** with **Jun**.
- Don't worry about getting 0's in the Actual columns—we don't yet have any expenses for the second quarter in our Ledger yet.

Conclusion:

If you have followed parts A, B, and D of this project, you will have created a simple, yet powerful budget spreadsheet. Part C, the Pivot Table, is optional, but could be useful for analyzing spending habits.

Now, of course, comes the really hard part: inputting our actual expenses. Good luck, and let's hope this budgeting tool saves you a ton of money.

In the process of creating our budget, we've used several advanced Excel tools. Be sure to use them in other projects, as they can save you quite a bit of time.

If you have questions, problems, or even improvements, please be sure to let me know. I would be happy to hear from you.

— Rich Malloy

[End]