

'DIY BI' Tips, Tricks & Techniques

Excel Edition

By Excelguru Consulting Inc.



'DIY BI' Tips, Tricks & Techniques – Excel Edition

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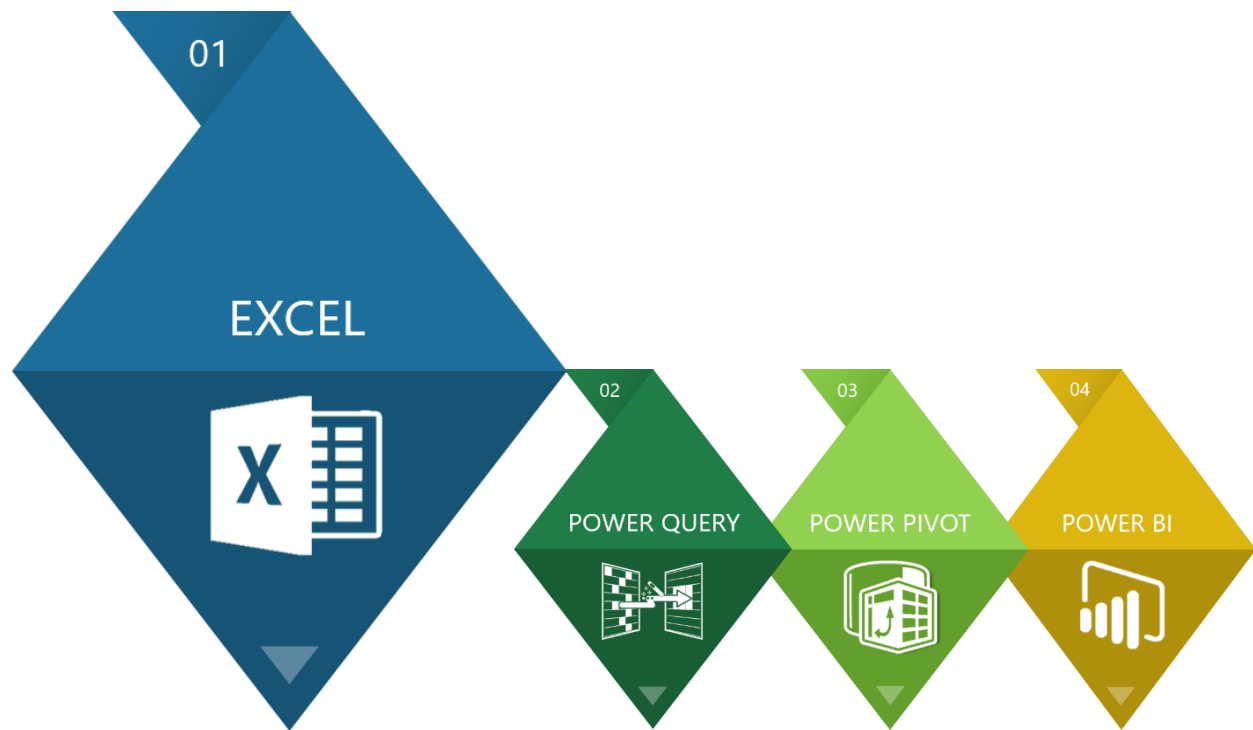
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About this Book

This free eBook is the first in a series of four that will be released to our Excelguru email newsletter subscribers. Each book contains five of our favourite tips, tricks, and techniques, with one book each for Excel, Power Query, Power Pivot, and Power BI. The tips and tricks shared in these books have been developed over years of research and real-world experience.



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Easiest Formula to Return the End of the Month

Dates form a big part of many of the Excel analysis and business intelligence solutions that I build. One thing I can tell you for certain, is that when you deal with accountants, providing any old date isn't sufficient. We want reports shown based on the last day of the month in about 99% of cases.

The easiest way to get the month end date in Excel is to use the EOMONTH() function. It's been in Excel for a long time, although in versions prior to Excel 2007 you had to activate the Analysis Toolpack add-in to expose it.

So what is this function, and how do we use it? It looks like this:

```
=EOMONTH(start_date,months)
```

The real trick to this function is all about the last parameter, as that is which month end you get. It works like this:

- -x: End of month x month(s) ago
- 0: The end of the current month
- x: End of month plus x month(s)

And the best part is that it is February 28/29 aware. Here's some samples:

Cell A1 Contains	This Formula	Will Yield
2017-01-15	=EOMONTH(A1,0)	2017-01-31
2017-01-15	=EOMONTH(A1,-2)	2016-11-30
2017-01-15	=EOMONTH(A1,4)	2017-05-31
2016-02-15	=EOMONTH(A1,0)	2016-02-29
2016-02-15	=EOMONTH(A1,12)	2017-02-28

With this function, you can also pick up the end of the current year or even next year with a slight modification:

Current Year	Next Year
=EOMONTH(TODAY(),12-MONTH(TODAY()))	=EOMONTH(TODAY(),24-MONTH(TODAY()))

And likewise, we can even get the beginning of the current or former year with the following:

Current Year	Previous Year
=EOMONTH(TODAY(),-MONTH(TODAY()))+1	=EOMONTH(TODAY(),-MONTH(TODAY())-12)+1

This function is useful not only for schedules and analysis, but can also form the base calculation for building calendar tables.



Show Message if Your Pivot Data is Stale

One thing that has saved my bacon many times is the creation of an error checking section for my model. The more complicated the model, the more this is necessary, but you'll find the main effort is worth it even for small models. And one key area is around recognizing if the source data for a PivotTable has been updated.

Imagine we have the report shown below:

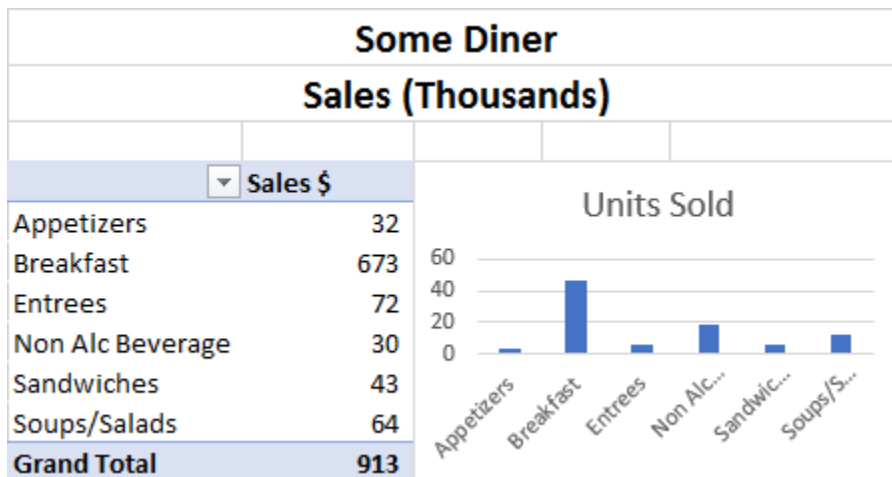


Figure 1 - A report based on a Pivot Table and Pivot Chart

How do you know that the Pivots are up to date? The simple answer is “You don’t”. So why don’t we fix that by adding a simple error checking section above the report? Something that looks like this:

Error checks	Per Data	Per Pivot	Difference
Sales Items	56	56	0
Total Sales \$	913.4	913.4	0
Pivots are up to date			0

Figure 2 - A simple error checking section

The Data Table

One caveat I will throw out here is that my data is based on an Excel table which I called “Data”, as shown in Figure 3, below. Note that this is not just a tabular range. (If you click in your data and don’t see the Table Tools tab pop up, it’s just data, so press CTRL+T to fix it.) The reason for this is that tables automatically expand as new data is added, a huge benefit for keeping both your formulas and Pivot Tables up to date.



Table Name: **Data** (indicated by a red arrow)

Properties: ☒ Header Row, ☐ Total Row, ☒ Banded Rows

Tools: Summarize with PivotTable, Remove Duplicates, Convert to Range, Insert Slicer

External Table Data: Export, Refresh, Unlink, Open in Browser

Item	Category	Group	Units	Price	Total Sale
Brunch Omelette	Breakfast	Food	1	15.00	15.00
Garlic Bread	Soups/Salads	Food	2	3.00	6.00
Grilled Chicken Clubhouse	Sandwiches	Food	1	13.00	13.00
Manhattan Seafood Chowder	Soups/Salads	Food	1	6.00	6.00

Figure 3 - The "Data" Table

The Error Check Pivot

Before we lay out the error check table, we do need to create another very simple Pivot Table that shows our summary statistics. This is done by creating a new Pivot Table from the Data source and then dragging the Item and Total Sale columns into the Values area:

Sum of Total Sale		Count of Category
913.4		56

Figure 4 - PivotTable used for summary statistics

Where you put this pivot is up to you... it can even be hidden on a different worksheet if you like. I put mine on a worksheet called “Validation” starting in A3.

The Error Check Table

We can finally lay out the error check table shown in Figure 5:

	A	B	C	D	E
1	Error checks		Per Data	Per Pivot	Difference
2	Sales Items		56	56	0
3	Total Sales \$		913.4	913.4	0
4	Pivots are up to date				0

Figure 5 - The error check table

I generally like to put this at the very top of my worksheet above the report headers so that I can always see it.

Here is the makeup for the formulas:

- Per Data: Sales Items:
`=COUNTA(Data[Item])`
- Per Data: Total Sales \$:
`=SUM(Data[Total Sale])`
- Per Pivot: Sales Items:
`=GETPIVOTDATA("Count of Category",Validation!A3)`
- Per Pivot: Total Sales \$:
`=GETPIVOTDATA("Sum of Total Sale",Validation!A3)`
- Difference formulas are “Per Data” – “Per Pivot” except for the last, which is just a sum of the cells above

And finally, we come to the cell that reads “Pivots are up to date”. This is actually an IF statement that was created as follows:

`=IF(E4<>0,"Source data has changed!","Pivots are up to date")`

And with a tiny bit of conditional formatting magic, it becomes pretty obvious that the source data has changed but we have forgotten to update our Pivot Table:

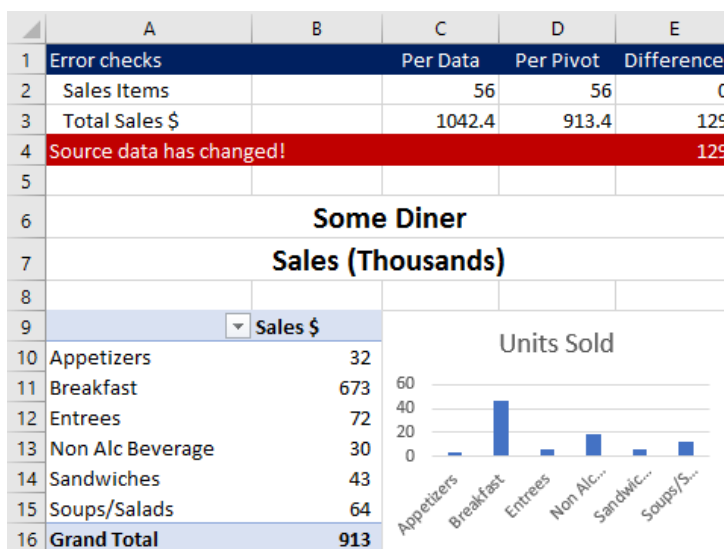
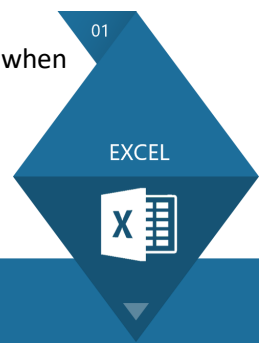


Figure 6 - Alert! Your Pivots are out of date!

Be aware that you should test your error checking aggregations. You may want more columns included, and you may also need to modify the tests if you have both positive and negative values (as the variances could cancel each other out, resulting in a 0 difference at the end.)

I will say that properly constructed tests are worth its weight in gold since it makes it very obvious when something goes wrong. I highly recommend taking the time to implement this technique.

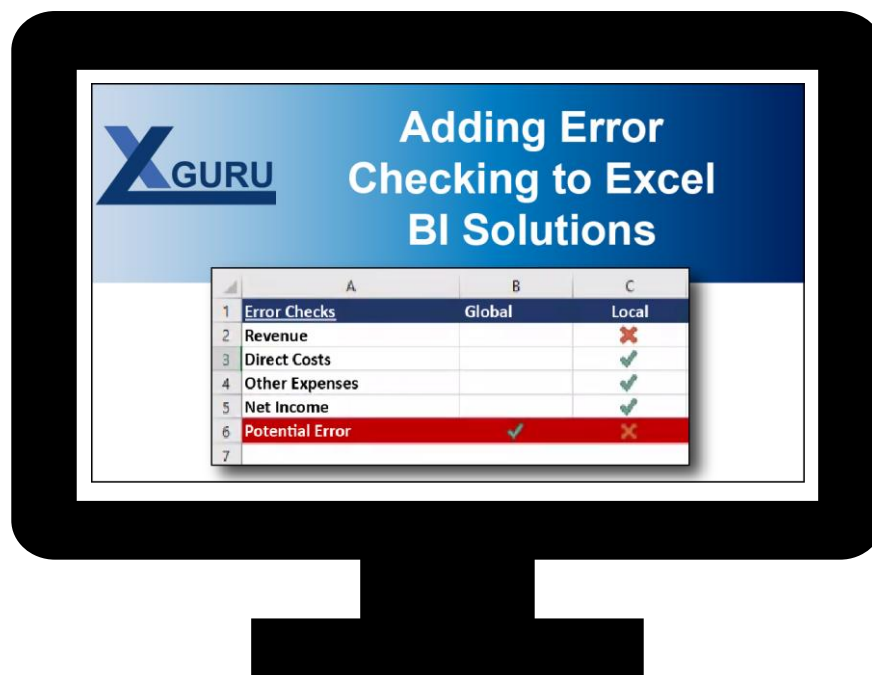




Extend Your Learning

If you are interested in learning more about creating error checks in your Excel business intelligence solutions, check out our **one-hour video course**.

Details and registration at:
<https://courses.excelguru.ca/>

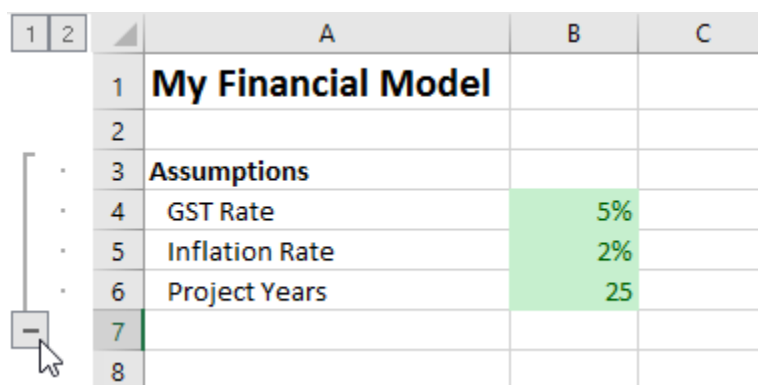


Show Message When Cells are Hidden

The reality is that you don't always need to see your assumptions, error checking or parameter tables. And while you could just hide those rows, it's not super obvious to someone else that you've done so.

My preferred method for dealing with this issue is to use a combination of techniques to allow hiding the rows when I don't need them, but also to make it easy for my user to both recognize and unhide the rows when needed. To do this, I use a combination of the outlining tools and an IF statement to react to a formula that counts visible cells.

Here's a look at an assumption section that you might find at the top of one of my models:

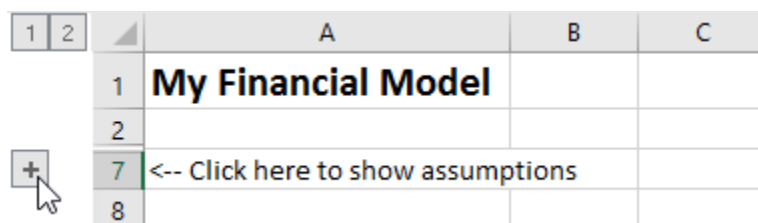


The image shows an Excel worksheet with a table structure. The first row is a header with columns A, B, and C. Below the header, row 1 contains the title 'My Financial Model'. Row 2 is empty. Row 3 is the start of a grouped section titled 'Assumptions'. Rows 4, 5, and 6 are part of this group and contain data: 'GST Rate' with a value of 5%, 'Inflation Rate' with a value of 2%, and 'Project Years' with a value of 25. Row 7 is the first row outside the group and is empty. Row 8 is also empty. To the left of the table, there is a vertical bar with a minus sign icon and a mouse cursor pointing at it, indicating that the group is currently expanded.

	A	B	C
1	My Financial Model		
2			
3	Assumptions		
4	GST Rate	5%	
5	Inflation Rate	2%	
6	Project Years	25	
7			
8			

Figure 7 - Assumptions on display

And when I click the – button on the left, it collapses to look as follows:



The image shows the same Excel worksheet as Figure 7, but the 'Assumptions' group is now collapsed. Row 3 is the last row visible in the group. Row 7 now contains a message: '<-- Click here to show assumptions'. Row 8 is empty. To the left of the table, there is a vertical bar with a plus sign icon and a mouse cursor pointing at it, indicating that the group is currently collapsed.

	A	B	C
1	My Financial Model		
2			
7	<-- Click here to show assumptions		
8			

Figure 8 - Assumptions are out of the way for the moment

There are two parts to setting this up:

1. Creating the grouping outline, and
2. Creating the formula

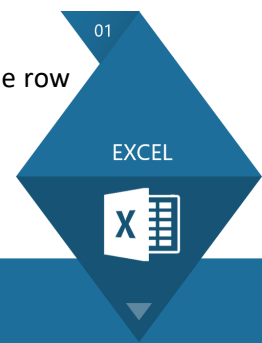
Part 1: Creating the grouping outline

If you've never used grouping before, this part is actually deceptively simple. You just need to:

- Select rows 3:6
- Go to Data → Outline → Group

Upon doing so, the worksheet should now look as shown in Figure 7.

The only real trick to understand here is that the expand/collapse (+/-) row is always created as the row immediately following your selection.



Part 2: Creating the formula

The next trick is creating the formula that counts the visible rows, which is shown below:

```
=IF (
    SUBTOTAL (103,A3:A6)=0,
    "<-- Click here to show assumptions",
    ""
)
```

Like every IF function, there are three parts: The logical test, what we want if the test is true, and what we want if the test is false.

The logical test here makes use of the SUBTOTAL function to count the number of cells in A3:A6 that contain text. The first parameter for the SUBTOTAL function is “function_num”, and the secret here is that we don’t want to use function 3 for our COUNTA, we actually want to use 103.

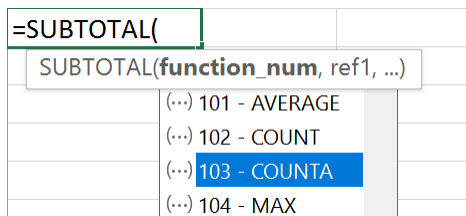


Figure 9 - Choosing how the SUBTOTAL function calculates its value

Even though both function 3 and 103 show as COUNTA, the difference is that all of the functions in the 100’s only count *visible* cells. As the cells are no longer visible when the grouping level is collapsed, we can set up a simple test to see if the count of visible cells in the grouping area is 0. If it is, the section must be collapsed.

So with the test set up, we then need to tell Excel what we’d like to see in the cell if the rows are all collapsed. As we’d like to see some text, we simply wrap our desired phrase in quotes. This could be anything, but personally I’m a big fan of creating an arrow that points right to the button that needs to be clicked to show the range.

Finally, we come to the output we want to see if the area is expanded. In the case of the provided formula, the “” will return a blank. (Everything between the quotes – which is nothing – will be returned to the cell.) Depending on your model, you may wish to have a message here like ‘Insert new assumptions above this cell’ or something. That’s completely your call.

And that’s it. Super easy, but very powerful. I use this technique often to collapse my assumptions areas, but also to hide the detail for the error checking sections of my models.



Quick Alignment of Objects

I'm not 100% sure about other people out there, but one thing I do know for certain is that finance people tend to be rather... particular... about how things look. When I present Excel sessions to finance pros, I always ask how many of them spend hours lining up charts, slicers and other objects on their worksheets to make sure that they line up perfectly level.

It always earns a chuckle, as we all do it, but unfortunately most of us are handling this task in a very manual method. If you've done this, you know just how hard it is to try and move a slicer or a chart up one pixel with the mouse. And then trying to get each slicer the same height... yikes!

Let's look at an example. Figure 10 has two slicers and a chart:

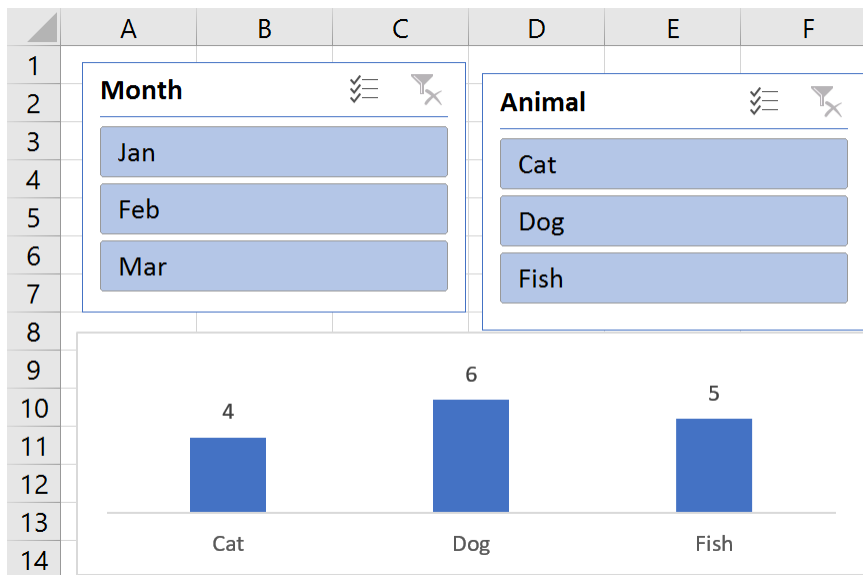


Figure 10 - How would you line these up?

How would you go about making sure that:

- The left borders of the Month slicer and the chart are aligned, and
- The right borders of the Animal slicer and the chart are aligned, and
- The top borders of the slicers are aligned, and
- Both slicers are the same height?

The good news is that there is a better way than manually dragging each item and trying to trace invisible lines.

Quick Alignment

Let's align the objects first:

- Select the Month slicer by clicking its header
- Hold down the CTRL key and select the Animal slicer (they should both be selected now)
- Go to Slicer Tools → Align → Top

And yes, it's just that easy!



Remember that holding down your CTRL key allows you to select multiple non-contiguous objects. (Unlike the Excel grid, however, holding down CTRL and clicking the object again un-selects it.)

The alignment commands can be found on the Drawing tab as well, so if you are picking up different types of objects (like Charts, Slicers or Shapes), you can still align them. You'll also notice that you have the option to align Left, Right, Top of Bottom, the only trick to know here is that it aligns to x-most item that you have selected.

Controlling Object Height/Width

I find that a lot of people overlook the fact that the sizes of our objects are actually displayed on the ribbon tabs. It may be due to the fact that we are used to dragging things around, it may be that there is just so much stuff to learn. Regardless, to get our slicers the same height, all we need to do is this:

- Select the Month slicer
- Check its height on the right side of the Slicer Tools tab
- Select the Animal slicer and change its height to match

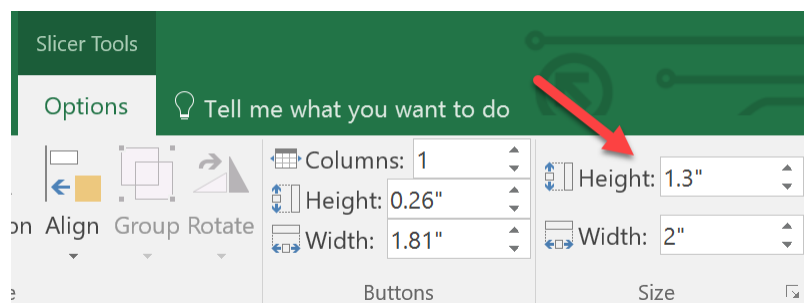


Figure 11 - Changing object sizes

It's also worth noting that other objects also show their sizes on the ribbon, and can be changed there as well. Charts, for example, have their sizes on the Chart Tools → Format tab

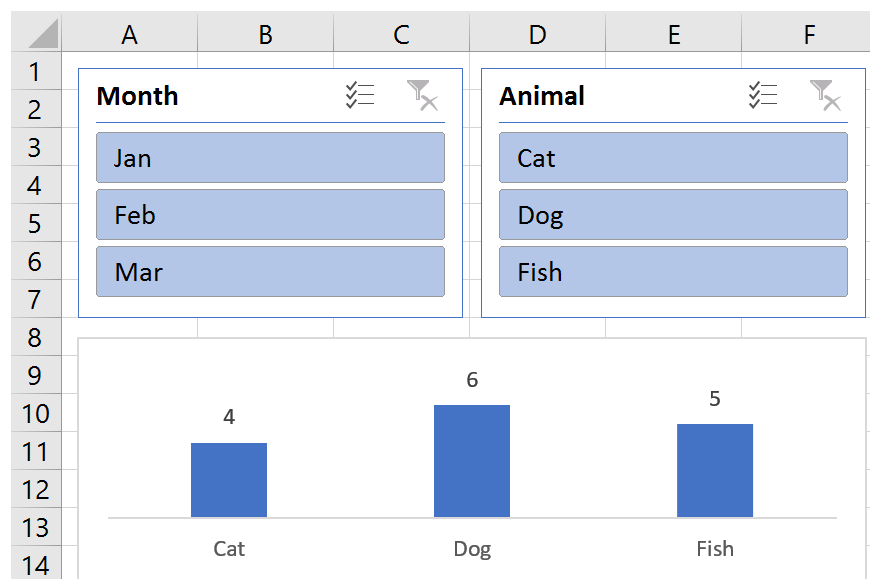


Figure 12 - Everything all lined up and perfect!



Easy to Read Variances

One of the cruelest things an accountant can do to someone who doesn't have a financial background is to provide them with a statement that looks similar to this:

	Actual	Budget	Variance
Revenues			
Alcoholic Beverages	15,747	35,012	(19,265)
Food & Non-Alc Beverage	34,524	44,740	(10,216)
Incidental Revenue	5,238	3,867	1,371
Total Revenue	55,509	83,619	(28,110)
Expenses			
Cost of Sales	24,978	24,296	(682)
Labour & Benefits	35,167	37,327	2,161
Other Operational	10,831	13,210	2,379
Total Expenses	70,975	74,833	3,858
Net Income (Loss)	(15,467)	8,786	(24,252)

Figure 13 - A horrible financial statement

At this point the poor manager needs to try and run the mental mathematics on the variance column to figure out if positive is good or bad, and if the rule holds true for revenues and expense. (Revenue lower than budget is bad, expenses lower than budget is good.) The challenge here is that the formula is not consistent between revenues and expenses (the sign needs to be flipped), and that is not always done.

I hated watching my users play the mental gymnastics game, so I decided to apply a trick from cost accounting with Excel. I probably freaked out a bunch of our newer managers, as they would get presented with this statement on a monthly basis instead:

	Actual	Budget	Variance
Revenues			
Alcoholic Beverages	15,747	35,012	19,265 U
Food & Non-Alc Beverage	34,524	44,740	10,216 U
Incidental Revenue	5,238	3,867	1,371 F
Total Revenue	55,509	83,619	28,110 U
Expenses			
Cost of Sales	24,978	24,296	682 U
Labour & Benefits	35,167	37,327	2,161 F
Other Operational	10,831	13,210	2,379 F
Total Expenses	70,975	74,833	3,858 F
Net Income (Loss)	(15,467)	8,786	24,252 U

Figure 14 - A financial statement with easy to read variances

This first time I would do this for each manager it was delivered with a cheerful “Here’s your statement. Now, let me tell you why it says eff-you all over it.” This was followed with a discussion of how we

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represented our numbers using F for Favourable and U for Unfavourable. And guess what... they never had to do mental gymnastics on our statements.

How do you do this?

We actually take advantage of a custom number format. To do this:

- Select the cells → right click → Format Cells
- Go to the Number tab → Custom
- Enter the following custom number format:

#,##0 F; #,##0 U; "- "

- Click OK twice and you're done

So how does it work?

There are four potential components to a custom number format, each separated by a semi-colon. Those are:

- Positive Numbers
- Negative Numbers
- Zeros
- Text

So in this case, you get:

- Positive numbers: #,##0 F
- Negative numbers: #,##0 U
- Zeros: "- " (quote, dash, space, space, quote)
- Text: omitted

And this is what the characters mean:

- # Show a number if one exists for that placement, otherwise omit it
- , Thousands (and higher) separator
- 0 Show in a 0 even if no number is needed for that position
- Space A space
- F & U Letters (sometimes need to be wrapped in quotes)
- "- " Everything between the quotes is returned to the cell

The biggest key here, however, is that we are not converting the values to text. If you look in the formula bar they are still numbers, meaning you can perform any mathematics upon them if needed.

Custom number formats can be useful for many things such as:

- Displaying dates in an ISO format: yyyy-mm-dd
- Displaying UPC codes with leading zeros: 0000-0000-0000-0000

And many more.

For more on custom number formats, check out my friend Jon Peltier's great article on the subject: <http://peltiertech.com/Excel/NumberFormats.html>

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'DIY BI' Tips, Tricks & Techniques

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POWER QUERY



03

POWER PIVOT



04

POWER BI

