# Sum Froduct

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# Are you charting the unknown with your graphing skills? Well, we thought there was just so much Power BI last month it was time to get

back to basics. Everyone loves a chart. So how about a good hard look on charts this month and next? Well, that's exactly what we decided to do!

It's not all about pretty pictures though. We provide a half-term report on Excel UserVoice and we still have our Power Query Pointers, more Power Query / Power BI updates and our continuing series of Keyboard Shortcuts and the A to Z of Excel Functions (have we **BIT** off more than we can chew?). There's even time for a Reader's Question.

Until next month.

**Chart Tips** 

Liam Bastick, Managing Director, SumProduct

- With the demise of Excel's Chart Wizard post-Excel 2003, the fastest way to set up a chart in Excel is to highlight the data and press the F11 function key (see last month's *Key Strokes*) and then make further changes using the 'Design' and 'Format' tabs from the Ribbon (and 'Layout for Excel 2007 and 2010) or use ALT + F1 to add the chart to the current sheet
- To change the colours and font of all text in the chart, simply select the entire chart and then make your choices on the 'Home' tab of the Ribbon (do note though that all text will resize consistently)
- Include chart data in a Table (*i.e.* put chart data together first, then highlight the data and Insert Table (ALT + N + T)). Creating a chart from this
  Table will allow you to add or remove entries such that the dependent chart will automatically update
- For Excel 2003 and earlier versions, to stop charts "dropping off a cliff" for missing data type in #N/A Excel won't plot these 'errors', viz.



• Sometimes you may wish to hide the chart data. With Excel's default settings, charts will appear blank if data is hidden. To counter this issue, right-click on the chart data points, select 'Select Data...' from the shortcut menu and then press the 'Hidden and Empty Cells' button



Select Data Source		?	$\times$
Chart <u>d</u> ata range: =Sheet1!\$C\$4:\$E\$10			<b>1</b>
Switch F	Row/Column		
Legend Entries (Series)	Horizontal (Category) Axis Labels		
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Data with Dropoff	Month 2		
	Month 3		
	Month 4		
	Month 5		~
Hidden and Empty Cells	ОК	Car	ncel

• Then, in the second dialog box, check "Show data in hidden rows and columns":

Hidden and Empty C	?	×						
Show empty cells as:	Gaps Zero							
Connect data points with line								
Show data in <u>h</u> idden rows and columns								
	OK	Ca	ncel					

• If you need to copy charts, the easiest way is to put the chart data and the chart on the same separate worksheet and then copy the worksheet. Once enough copies are made, cut and paste the charts and chart data back to where you require them in the rest of the workbook and delete any surplus worksheets. This method avoids a few glitches otherwise prevalent in chart copying.

## Advanced Charting Tips

This newsletter is intended to simply introduce some simple charting tricks. But these are the tips of the iceberg. For more advanced tips and charts, why not visit our website, *e.g.* 

Waterfall charts		www.sumproduct.com/thought/waterfall-charts
Tornado charts	WorkfordCharf Langter Woldbrugh	www.sumproduct.com/thought/tornado-charts
Dynamic charts	Depends Charl Example	www.sumproduct.com/thought/onset-of-offset
Hyperlinking to chart sheets	Hyperlink back to Chart Data	www.sumproduct.com/thought/hyperlinking-chart-sheets

## **Chart Data and Tables**

Many analysts and accountants need to keep a rolling budget going (we have written about the way to do this a few times), but few articles seem to exist about to make charts automatically update for the latest information. We keep getting asked if there are non-VBA solutions and the simple answer is, of course there are! And here's one...

Before starting though, let's back up a step and give you a general tip about chart data. Consider you had some financial data similar to the following:

	Α	В	С	D
1				
2		Date	Sales	
3		1 Jan 17	296	
4		1 Feb 17	405	
5		1 Mar 17	336	
6		1 Apr 17	451	
7		1 May 17	179	
8		1 Jun 17	123	
9		1 Jul 17	488	
10				

Highlighting the data (here, cells B2:C9) and using the keyboard shortcut ALT + F1 produces a quick and dirty chart, viz.



Believe it or not, that's not the chart tip (because we've already mentioned it in this newsletter!), although many people are impressed when they see that for the first time. However, the novelty starts to wear off, when you add the next period's data and *nothing* happens:



#### Most of us have been there and bought that t-shirt. Therefore, with a heavy heart, you right-click on the chart and choose 'Select data...'



and from the resulting dialog box you update the date and sales references:

Select Data Source		?	$\times$
Chart <u>d</u> ata range: =Sheet1!SBS2:SCS9			1
Switch F	Row/Column		
Legend Entries ( <u>S</u> eries)	Horizontal (Category) Axis Labels		
Add <u>E</u> dit <u>Remove</u>	Edi <u>t</u>		2
Sales	🗹 1 Jan 17		^
	✓ 1 Feb 17		
	🗹 1 Mar 17		
	🗹 1 Apr 17		
	🗹 1 May 17		~
Hidden and Empty Cells	ОК	Ca	ncel

Surely there is a better way? Yes there is – and don't call me Shirley...

Let's back up. After entering the data and before creating the chart, convert the data range to a Table (**CTRL + T**, or from the 'Insert' tab on the Ribbon, choose 'Table' from the 'Tables' section):

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B2		<b>*</b>		×	~	$f_{x}$	Date
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2		Da	te	Sé	ales		
3		1 Ja	n 17		296		
4		1 Fe	b 17		405		
5		1 Ma	ar 17		336		
6		1 Ap	or 17		451		
7		1 Ma	iy 17		179		
8		1 Ju	n 17		123		
9		1 Ju	11/		488	721	
10							
12						E.+	

Ensure the 'My table has headers' check box is ticked in the ensuing dialog box:



Now add a chart as before, but this time, when additional data is added the chart automatically updates:



How good a trick is that? Therefore, I have a rule with chart data: always put it in a Table before creating the chart. It just makes life easier.

## **Rolling Charts**

A "rolling" chart is just like a rolling budget: it displays the last **x** months (typically, the past 12 months), but keeps up to date automatically. The idea is similar, but not quite the same, as we do not wish to extend the range, simply keep moving the 12 months along the time axis.

To do this, you still create a Table (mine is labelled 'Chart\_Data'):

Table Nar	ne:	<b>1</b>	Summariz	e with	PivotTa	able
Chart Da	ta	Remove Duplicates				
<u> </u>						
'∰• Kesizi	e lable	<u>5</u>	Convert to	o Kang	le	
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8	For Ch	art I	Jata			
9						
10			Date		Sales	
11			1 Jan 1	6	296	
12			1 Feb 1	6	405	
13			1 Mar 1	6	336	
14			1 Apr 16	6	451	
15			1 May 1	6	179	
16			1 Jun 1	6	123	
17			1 Jul 16	3	488	
18			1 Aug 1	6	452	
19			1 Sep 1	6	459	
20			1 Oct 10	6	101	
21			1 Nov 1	6	290	
22			1 Dec 1	6	476	
23			1 Jan 1	7	249	
24			1 Feb 1	7	291	
25			1 Mar 1	7	136	
26			1 Apr 1	7	322	_
27			1 May 1	7	189	_
28			1 Jun 1	7	314	
29						

Then, calculate the latest date in the formula by typing =MAX( and then highlighting cells F11:F28 in my example. This gives the formula

#### =MAX(Chart\_Data[Date])

(the syntax will be slightly different if you are still using Excel 2007). The great thing about this formula expressed in this way is as the dates extend, the range will update automatically. Let's use this formula in the final row of a second table (check out cell **L22** in the image below):

L2	2		Ŧ	:	$\times$	$\checkmark$	$f_{x}$	=MAX(Chart_Data[Date])							
	в	С	D	Е	F		G	н		1	J	к	L	М	N
7															
8		For	Cha	art [	Data							Fro	m Left		
9															
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12					1 Feb 1	16	405	5					1 Aug 16	452	
13					1 Mar 1	6	336	5					1 Sep 16	459	
14					1 Apr 1	6	451						1 Oct 16	101	
15					1 May 1	16	179						1 Nov 16	290	
16					1 Jun 1	6	123	5					1 Dec 16	476	
17					1 Jul 1	6	488	5					1 Jan 17	249	
18					1 Aug 1	16	452	2					1 Feb 17	291	
19					1 Sep 1	16	459						1 Mar 17	136	
20					1 Oct 1	6	101						1 Apr 17	322	
21					1 Nov 1	16	290						1 May 17	189	
22					1 Dec 1	16	476	<b>;</b>					1 Jun 17	314	
23					1 Jan 1	7	249							-	
24					1 Feb 1	17	291								
25					1 Mar 1	7	136	j							
26					1 Apr 1	7	322	2							
27					1 May 1	17	189								
28					1 Jun 1	7	314								
29															

To populate the rest of the data in column L, in cell L21 I write the following formula

#### =EDATE(L22,-1)

This generates the same day of the month one month earlier. I then copy this formula into cells L11:L20. Finally, I use a LOOKUP formula to derive the Sales data. For example, the formula in the final period here is

#### =LOOKUP(L22,Chart Data)

Here, the **LOOKUP** formula will always look for the date in the first column of **Chart\_Data** and return the value in the final (second) column. You should note that this chart data table is always 12 rows deep for a 12-month look-back. If you need a rolling budget for a different duration, simply amend the number of rows accordingly. It is this table that populates the chart:



488
452
459
101
290
476
249
291
136
322
189
314

#### **Using Second Table**



Pretty cool, eh?

## **Using Slicers with Charts**

Want to know an easy way to filter your PivotTable report without having to use the drop-down lists to find items you want to filter? Slicers are easyto-use filtering options that contain a set of buttons that enable you to quickly filter the data in a PivotTable report. Multiple slicers can be linked to a PivotTable report with the filters clearly defined so that the data is easily identifiable.

#### Let's have a look at using slicers with some examples.

#### The first thing to do is create a PivotTable from your data. For example:

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Select the fields you would like to see in the PivotTable and drag them into the area boxes below the fields. In this example, I've dragged 'Customer Name' into the 'Rows' area, 'Product Category' into the 'Columns' area and 'Amount' into the 'Values' area:

PivotChart Fields	5 -	×
Choose fields to add to rep	ort:	۶v
Search		۶
<ul> <li>Date</li> <li>Time</li> <li>Cust Name</li> <li>Cust Area</li> <li>Cust Group</li> <li>Prod Category</li> </ul>	pelow:	
<b>T</b> Filters	Columns Prod Category	•
Rows           Cust Name	$\Sigma$ Values Sum of Amount	•

The PivotTable appears as follows:

Sum of Amount	Column Labels 💌					
Row Labels	Bodywash	Cosmetics	Haircare	Nails	Skincare	Grand Total
Chemist Warehouse	231,253	2,735	223,143	6,704	4,483	468,318
DJs	7,176	258	220,468	2,245	6,646	236,794
Hairhouse Warehouse	20,663	795	678,203	242,530	6,976	949,167
Myer	4,433	223	1	4,431	2,205	11,292
National Pharmacies	29,818	3,011	225,929	447,246	17,996	724,000
Grand Total	293,343	7,022	1,347,743	703,157	38,306	2,389,571

With the cursor in the PivotTable (as pictured), you can add a slicer to filter the data based on another selection available in the data. All you have to do is select the 'Slicer' option in the 'Insert' tab:

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File Home Insert P	age Layout Formulas Dat	Review View A	dd-ins Power Pivot I	RefTreeAnalyser Ana	alyze Design					R	Share
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Tables	Illustrations	Add-ins	Charts	rs Tou	urs Sparki	ines Filters	Links	Text		Symbols	^

#### A list of available slicers ensues:

Insert Slicers	?	$\times$
Date		
Time		
Cust Name		
🗸 Cust Area		
Cust Group		
Prod Category		
Prod Size		
Qty		
Amount		
ОК	Ca	ancel

Having selected 'Cust Area', a slicer will now appear next to you PivotTable as follows:

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File Home Insert Page Layout Formulas Data	Review View Add-ins Power Pivot RefTreeAnalyser	Analyze Design 📿 Tell me what you wan	t to do 🛛 🕹 🖓 Share
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Image: Constraint of the second se	E F G H I Fror Checks: ☑ Cosmetics Haircare Nails Skincare Grand Total 253 2,735 223,143 6,704 4,483 468,318 176 258 220,468 2,245 6,646 238,794 663 795 678,203 24,2530 6,976 949,167 433 223 1 4,431 2,205 11,292 818 3,011 225,929 44,7246 17,996 724,000 343 7,022 1,347,743 703,157 38,306 2,389,571	J K L M A	PivotChart Fields  Choose fields to add to report  Coust Group Cust Group Prod Category Prod Size Quy Amount More Tables  Trag fields between areas below:  Fitters Columns Fitters Columns Columns Sum of Amount Cust Name Cus
Avigator Style Guide Model Parameters	Sheet5 Data One 🕂 : 4		Defer Layout Update Update
Ready			III + 100%

Note that this field does not have to be in the PivotTable – this provides you with more ways to 'slice' your data and a chart can be made from the resulting table.

It doesn't have to be just one slicer. You can repeat the above process and add another, such as 'Cust Group':

Insert Slicers	?	$\times$
Date		
Time Time		
Cust Name		
Cust Area		
🗹 Cust Group		
Prod Category		
Prod Size		
Qty		
Amount		
ОК	Can	cel

Using the 'Cust Group' slicer you can select 'Pharmacy' which will update the PivotTable to show only customers that are in the 'Pharmacy' category. You can use the 'Cust Area' slicer simultaneously to view the 'SA' Pharmacy sales.

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F9	×	: ×	$\checkmark f_x$																~
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The idea can be extended further. As well as using multiple slicers with one PivotTable we can also have multiple PivotTables being filtered with one or more slicers. Let's see how this might work.

First, add another PivotTable based on the same data source (shared data). Then, consider adding in a PivotChart by selecting 'PivotChart' on the 'Insert' tab too:

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File Home Insert Pa	sge Layout Formulas Data	Review View /	Add-ins Power Pivot RefTr	eeAnalyser Analyze	Design 🗘				۶, R	hare
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Tables	Illustrations	Auld Inc.	Chaste	r. Tours	Sparklines	Elters	inks Text		Sumbale	

A selection of charts will appear, e.g.

Insert (	Chart		?	×
All Cha	rts			
	Recent Templates Column			
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٩	Pie	Department Store		
E	Bar	800,000		
	Area	600,000		
	X Y (Scatter)	400,000 Bepartment Store		
hhĺ	Stock	200,000		
æ	Surface	100,000		
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At this stage, you will notice that the slicer is not connected to either the second PivotTable or PivotChart. We need to ensure that the slicer is interacting with both PivotTables. To do this, right-click on the slicer and select 'Report Connections':

Report Co	?	$\times$								
Select PivotTable and PivotChart reports to connect to this filt										
	Name Sheet									
✓ 2	PivotTable17		Multipl	e Pivot]	Tables					
✓ 🚺	PivotTable18		Multiple	e Pivot	Tables					
	PivotTable16		Multiple Slicers							
	PivotTable16		One Sli	cer						
		OK	(	C	ancel					

This will bring up a list of PivotTables and PivotCharts in your workbook, albeit labelled rather randomly. Select the PivotTables you have just created – you can see which ones they are based on the 'Sheet', or you can find out the table name by clicking on the 'Analyze' tab on the Ribbon. The table name will be shown under the 'PivotTable' section:

File	Hom	e Insert	Page Layout	Formula	is Data	Review	View	Add-ins	Power P	livot	RefTreeAnalyser	Analyze	Design
PivotTable N	ame:	Active Field:	J	<b>小</b> +=	→ Group	Selection			2			🔯 Clear 🔻	
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Options	Ŧ	Field Setti	ngs <sub>Down</sub>	Up -	7 Group	Field	Slicer	Timeline Co	onnections	Terres.	Source -	🛃 Move Piv	otTable
PivotTabl	e		Active Field		Gre	oup		Filter			Data	Action	s

Selecting 'OK' allows your PivotTables and PivotChart to interact with the slicer. You can continue; it doesn't take much more effort to add a 'Timeline' which will allow you to view your data based a selected date – simply select 'Timeline' which is shown under the 'Insert' tab on the Ribbon:

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Select 'Date' and 'OK':

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You should now have a timeline and a slicer that are interacting with two PivotTables and a PivotChart viz.

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With a little rearranging and formatting, you can have a very powerful interactive dashboards in minutes.

## **Excel User Voice Finding its Voice**

The website www.excel.uservoice.com has been around a while now and it is clearly becoming effective. The idea was that regular Excel users could suggest improvements to the world's second-best software for anything and, if you get enough votes in the bag, Microsoft would sit up and take notice. The first six months of 2017 has had some great successes we thought we would share with you:

#### Personalise the default PivotTable layout (votes at time of printing: 561)

Excel 2007 introduced the new Compact Form of PivotTables and made the default for all future PivotTables. This went down about as well as a case of the mumps. Users asked whether they could personalise their default settings rather than let Redmond rule the roost.

Microsoft listened and there are now two ways you can adjust the layout settings for the PivotTable defaults. One way is to simply click the newly added 'Edit Default Layout' button under the **File -> Options** menu to display the Edit Default Layout dialog. Here you can make changes to your layout options and it also includes all of the settings in the 'PivotTable Options' dialog *viz*.

Edit Default Layout	? ×
Layout Import	
1	Import
Subtotals	
Show all Subtotals at Top of Group	Include <u>Filtered Items in Totals</u>
<u>G</u> rand Totals	
On for Rows and Columns	/
Report Layout	
Show in Compact Form	Repeat All Item Labels
Blank Rows	
Insert Blank Line after Each Item	PivotTable Options
Reset to Excel Default	OK Cancel

You can also import a layout from a PivotTable already in your workbook and customise the layout from this base. This is particularly useful if you have a layout you'd like to use all the time: simply open the 'Edit Default Layout' dialog, click anywhere within a PivotTable in your workbook and then click the 'Import' button.

#### Copy-Paste Clipboard Persistence (224 votes)

When copying a cell (**CTRL + C**), if you started typing in another cell in Excel, this would cancel the copy, *i.e.* there would be nothing to paste. Therefore, you would have to go back to the item to re-copy it – but not so anymore.

Starting with the Excel releases available in June, Excel "kept" your copied items for longer. Now you can copy your cells, and before you paste, you can still do other tasks like typing, inserting cells or running a bath.

Based on customer feedback, the dotted "Marquee" (the so-called

#### Add Superscript and Subscript Icons (372 votes)

"dancing ants") stay active for much longer so that you can type, add formatting or many other things before the paste operation. Microsoft has also made both the 'Insert' and 'Insert Copied Cells' commands available after the copy operation.

Just as an aside, if you want the Marquee to disappear, you can use the **ENTER** key to perform the paste operation, or after the paste, you can press the **ESC** key to cancel the copy.

Users noted that Word has had direct access (with icons) on the Ribbon for subscripting and superscripting characters for some time, but Excel can do so only via the **Home -> Font** menu item. Given scientists, engineers and people with good eyesight need to use subscript and superscript characters, a request was made to have these available so that they may be added to the 'Customize QAT' feature.



Microsoft claims to have done this and indeed they are in build 1705, although we note for builds 1706 onwards (i.e. for those of you that keep your Excel up to date), they appear to have vanished again. Microsoft knows though – and we are sure this will be fixed soon!

#### Co-authoring (215 votes)

In Word and PowerPoint, it's been possible to collaborate from the desktop as well as online. However, in Excel, whenever anyone opens a document, others get locked out of editing and can only view the file.



We mentioned in May's newsletter that Microsoft had announced that it is enabling co-authoring in Excel on Windows desktops for Office Insiders Fast. This allows you to know who else is working with you in a spreadsheet, see where they're working and view changes automatically within seconds. It is still being tested, so Microsoft encourages early adopters to continue using feedback channels to improve the experience before making it available more broadly. Co-authoring is already available in Excel Online, Excel on Android, too.

To use co-authoring in Excel on Windows desktops, you must:

- Be an Office 365 subscriber and opted into the Fast level of the Office Insider program
- Have Version 8017.1000 or later installed
- Save your file to SharePoint Online, OneDrive or OneDrive for Business
- · Work with another user who is on a co-author enabled platform
- Share your file with others in the Insiders program.

It should be stressed that you do not require the updated OneDrive for Business sync client (that will be a relief to all of those who have absolutely no idea what I am talking about). As long as the file lives in the Cloud, co-authoring will work. It does not matter if you are using a sync client or not. If you load from your local sync folder instead, Excel will still realise it comes from the Cloud and co-authoring should still work. (When we say "Cloud" by the way, we mean SharePoint Online, OneDrive or OneDrive for Business.)

Furthermore, you can co-author with others not in the Insiders program. However, they will not be able to take advantage of co-authoring on Excel on Windows desktop and must use another supported version (Excel Online, Excel on Android or Windows Mobile) instead.

As mentioned above, AutoSave is critical to this functionality. In Excel 2016 for Office 365 subscribers, you may have noticed AutoSave in the upper-left corner. AutoSave is enabled when a file is stored on OneDrive, OneDrive for Business, or SharePoint Online. It automatically saves your changes to the cloud as you are working, so be careful. The idea is that if other people are working on the same file, AutoSave lets them see your changes in just a matter of seconds.

To use AutoSave in Excel in this way, you must:

- Be an Office 365 subscriber and opted into the Fast level of the Office Insider program
- Have Version 8017.1000 or later installed (as above)
- Use .xlsx, .xlsm, or .xlsb files. If your file isn't in this format, open the file and then click **File > Save As > Browse > Save as type**. You should change the format to .xlsx, .xlsm, or .xlsb for this to work
- Save your file to a shared location.

In Excel on Windows desktops, Office 365 subscribers might notice an AutoSave option in the upper-left corner. AutoSave is enabled when a file is stored on the Cloud. It automatically saves your changes to the cloud as you are working. If other people are working on the same file, it lets them see your changes almost instantly. When co-authoring with other people, AutoSave will save every few seconds (that's a little scary...). This time may vary depending upon what you are working on.

To get started, upload a workbook to a supported, shared Cloud location such as SharePoint Online, OneDrive or OneDrive for Business. Then, you will need to share your workbook with others. If you clicked the 'Share' button, people will receive an email message inviting them to open the file. They can click the link to open the workbook, a web browser will open, and the workbook will open in Excel Online. To use co-authoring in Excel on Windows desktop, click **Edit Workbook > Edit in Excel**. However, these users will need a version of Excel that supports co-authoring too.

At the time of writing, co-authoring is currently supported for all customers in Excel Online, Excel on Android and Excel Mobile on Windows. Coauthoring is currently available in Excel on Windows desktops for Office 365 subscribers in the Fast level of the Office Insider program only. It's also available in Excel on iOS for Office Insiders too. If the people you are collaborating with you do not have a supported version of one of these apps, they can co-author using Excel Online by clicking **Edit Workbook > Edit in Browser** instead.



#### Pictures in the Header or Footer in Excel for Mac (698 votes)

Mac users will know this is just about the only thing you haven't been able to do on a Mac (er, just kidding!). Clearly, this has been a bone of contention with so many votes. As of the 11 July update (version 15.36), you can now insert images in the headers and footers on Excel for Mac.



#### Page Break Preview in Excel for Mac (42 – yes, that's right, 42 – votes)

Douglas Adams said that the answer to the meaning of life, the universe and everything is 42. It would seem so for Excel. Just to show it's quantity not quality that gets ideas across, page break preview is now available for the Mac. You can now find the 'Page Break Preview' button next to the 'Page Layout View' button on both the Ribbon and in the status bar. Thanks to **B. Gates** who suggested this one (I'm joking...).

#### Create and Modify Freeze Panes in Excel Online (161 votes)

The ability to Freeze Panes, Freeze Top Row, Freeze First Column has been available since May.

#### Select All in Excel Online (175 votes)

It's amazing to think what we take for granted in the desktop version of Excel. In February, Excel Online began to allow you to 'Select All' cells in a range, a table, or sheet by using **CTRL + A** or by clicking the triangle at the top left corner of the grid.

#### Format Painter in Excel Online (154 votes)

This elementary feature became part of the furniture in February's updates too.

### Find and Replace in Excel Online (333 votes)

Still couldn't find what you're looking for? It was only at the beginning of this year that you could actually find and replace items in Excel Online (although 'Find' has been around a while).

### Add Support for Shapes in Excel Online (68 votes)

Another with a smaller number of votes, it's been recognised that Excel Online has not allowed you to view or edit shapes. As of 30 June, shapes may now be viewed; editing and inserting will be coming to a theatre new you soon too.

## Apple Pencil with Excel for iPad and iPhone (17 votes)

Now we are getting to the popular stuff. The Apple Pencil (the iPencil?) is not just a drawing tool. It should also be used as a pointy thingy for those of us with fat fingers. Microsoft agreed with the July 11 update.

### New Excel 2016 Functions to be included in Excel for iPad and iPhone (3 votes)

Three votes!! Busy times at Redmond High. Yes, you can now use the six new functions **CONCAT, IFS, MAXIFS, MINIFS, SWITCH** and **TEXTJOIN** on your iPhone. Be very aware if you start writing **IFS** functions on any platform, we are coming to kill you.



You can check these functions out in our March 2016 newsletter or else in the 'Thought' section of our website at www.sumproduct.com/thought/ excel-2016-functions-and-features.

#### Add a Number Keypad in Excel for Android (24 votes)

Surprise, surprise, more people use Excel on Android devices than iPhones. New to the late June update, Microsoft has added a virtual persistent 10-key pad (that's the numbers 0 to 9 for us less tech savvy people) that stays visible on the screen until it is disengaged deliberately.

#### One Last Thing: AutoSave (90 votes)



Remember this? Microsoft doesn't – well not yet anyway. 30 times more popular than adding new functions to an iPhone, will Microsoft please take a look? This UserVoice item was instigated by our very own Liam Bastick – but please don't hold that fact against this good idea.

To facilitate co-authoring, Microsoft has decided that AutoSave must be switched on by default. We don't have an issue with that. We just want a master switch to be able to turn it off, given having AutoSave switched on will cause problems for those of us who like to experiment. If you agree, please vote for it here. Let's hope we can report on this fix in our next roundup!

## **Reader's Question: Famous Last Words**

How can I obtain just the last few words in a sentence typed into an Excel cell?

#### Advice

It is easy to extract characters from a string if you know the precise number of characters to extract. **LEFT**, **RIGHT** and **MID** are just some of the functions you might use. The problem is, how do you extract the last **x** words from a sentence when the length of each word is variable?

Let's consider the following examples:

	А	В	С	D
1	Sentence	No. of Last Words	Famous Last Words	
2	Once upon a time in the west	3	in the west	=TRIM(RIGHT(SUBSTITUTE(A2," ",REPT(" ",LEN(A2))),B2*LEN(A2)))
3	Incomplete sentences are just really, really	1	really	
4	If you are not part When all else fails, give up	2	give up	
5	Roses are red, violence makes blue	4	red, violence makes blue	
6				

Cell **C2** in the example above contains the following formula:

#### =TRIM(RIGHT(SUBSTITUTE(A2," ",REPT(" ",LEN(A2))),B2\*LEN(A2)))

So how does this work?

- LEN(A2) calculates the length of the text string as a number of characters
- REPT(" ",LEN(A2)) repeats the space " " so that it is the same length as the sentence (LEN(A2))
- SUBSTITUTE(A2," ",REPT(" ",LEN(A2))) replaces all of the spaces in the text string and inserts a block of spaces equal to the length of the original text string in cell A2. This has the effect that if you separate out the original sentence into blocks of characters with the same numbers as the original sentence you will have one and only one word in each block the rest of the characters will be spaces
- RIGHT(SUBSTITUTE(A2," ",REPT(" ",LEN(A2))),B2\*LEN(A2)) therefore takes the last B2 number of blocks, where B2 represents the number of "last words" to be captured. In effect, this takes the last B2 words with lots and lots of spaces
- TRIM(RIGHT(SUBSTITUTE(A2," ",REPT(" ",LEN(A2))),B2\*LEN(A2))) then removes all of the excess spaces leaving you with the final B2 words. Success!

Easy when you know how - and now you do...

## **Power Query Pointers**

Each month we'll reproduce one of our articles on Power Query (Excel 2010 and 2013) / Get & Transform (Excel 2016) from www.sumproduct. com/blog. If you wish to read more in the meantime, simply check out our Blog section each Wednesday. This month we look at extracting metadata.

So far in this series, we have concentrated on how to use Power Query as a standalone tool. It's clearly a useful ETL (Extract, Transform and Load) tool. Well thought-out features allow data to be filtered, manipulated and merged. So far, our examples have been loaded into an Excel worksheet, but loading to the Excel data model instead allows further modelling and analysis by Power Pivot.

Power Pivot can fine tune the Excel data model and then perform calculations so that the data is ready to be displayed in PivotTables, charts or grids, or in a visualisation tool like Power View or Power BI. Power Pivot can create relationships between tables, and create formulas and KPI's (Key Performance Indicators).

Let's try an example to demonstrate the interaction.

A quick glance at the drop down from the 'From Database' tab in Power Query reveals a large selection of different kinds of databases that can be accessed in order to extract data:



Choosing the 'From Access Database' option allows us to browse for the database. Having selected the intended file, the navigator screen lists all of the tables in that database. Therefore, we can choose to preview 'ACCT\_Order\_Charges':

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7	Customers			2	1	2 1	0 1				
8	Dates			2	2	1 5	0 1				
10	Employees			2	2	2 1	0 1				
11	Internet_Sales			2	3	1 4	0 1				
12	Items			2	3	2 10					
13	Order Details			2	4	1 2	5 /				
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The table could be loaded as is, but instead let's elect to 'Edit the ACCT\_Order\_Charges' query. The Query Editor should be familiar to regular readers, and it allows us to remove data – so let's "discount" the 'Discount' column.

In order to do this, either select the 'Discount' column and right-click to find the 'Remove' option, or else use the 'Remove Column' option on the 'Home' tab viz.

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Then, you can use the 'Close and Load' option from the 'File' tab or the 'Home' tab, but in either case make sure to tick the 'Add to data model' box. Also, choose the 'Connection Only' option, which is also useful for merging tables / queries – as in this case we don't need to see the table in the workbook.

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#### In Power Pivot, go to the Manage (data model) option; 'ACCT\_Order\_Charges' is visible in the 'Workbook Queries' pane:

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Choosing to 'Manage' allows us to view the 'ACCT\_Order\_Charges' table in detail, ready to refine the data further by adding calculated columns and creating and managing relationships with other tables in the model.

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So does this really mean we can edit the table in Power Query and Power Pivot, or are there any problems to look out for? Let's explore.

Having started to refine the Excel model in Power Pivot, you are likely to find that changes to the model are necessary to facilitate the features that you want to add. The good news for users of Excel 2016 is that since Power Query has been fully integrated into the 'Get & Transform' section, there is no choice between using Power Pivot or Power Query. In earlier versions of Excel 2013, and in Excel 2010, it is possible to corrupt the Excel model by making some types of changes in Power Pivot. The current version of Excel 2013 stops us from making these changes in Power Pivot. And that is a good thing.

Returning to the example, let's change the table name to make it more user friendly:

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Clipboard	Get External Data		Formattin	g Sort an	d Filter Find	Calculations	View	
der_K	fe .							
Order_Key 🔽 Orde	er_Line_Number 🔽 Charge_Line_N	lumber 💌 Amo	unt 💌 Item_K	ey 💌 Order_Detail_	Key 🔽 Description 📘	Add Column		
1	1	1	195	5 1-1	8 x 3 metre			
6	1	1	195	5 1-6	8 x 3 metre			
10	1	1	195	5 1-10	8 x 3 metre			
16	1	1	195	5 1-16	8 x 3 metre			
18	1	1	195	5 1-18	8 v 3 metre			
24	1	1 Power	Pivot for Excel		×			
28	1	1	This table was cr	eated with Power Query. To	change this table, use			
31	1		Power Query ins	tead.				
36	1			ОК				
40	1	-	405	5 4 45				
40	1	1	195	5 1-40	8 x 3 metre			
40	1	1	195	5 1 54	o x 5 metre			
59	1	1	195	5 1-59	8 x 3 metre			
61	1	1	195	5 1-61	8 x 3 metre			
66	1	1	195	5 1-66	8 x 3 metre			
138	1	1	195	5 1-138	8 x 3 metre			

So, having received the message in the screen shown above, we are directed back to Power Query in order to rename the table. The reason that we are stopped from changing the name here is that in previous versions of Excel 2013 and 2010 users could change the name in Power Pivot which then broke the link between Power Query and Power Pivot. Therefore, there are some actions to be avoided in Power Pivot if the Excel model has been created in Power Query:

- Do not change a table name in Power Pivot
- Do not rename an imported column in Power Pivot
- Do not delete an imported column in Power Pivot

Any of these actions could result in a broken link between Power Query and Power Pivot.

## July 2017 Updates for Power BI Desktop

July saw in the usual myriad of new updates for Power BI: it's clear the Power BI Desktop train is not slowing down anytime soon. There were many updates to reporting and data connectivity.

In summary, the following updates have been released:

#### **Report View:**

- New table and matrix visuals are now generally available
- Renaming fields in visuals
- Custom visuals store integration
- Relative date filters
- Responsive layout for visuals (preview)
- New waterfall chart option breakdown
- Custom visual updates:
  - o Drilldown Choropleth
  - o Drilldown Cartogram
  - o Drilldown Player
  - o Certified custom visuals

#### Analytics and Modelling:

- Quick Measures from the community
- Star rating
- Concatenated list of values
- Bidirectional cross filtering for DirectQuery is now generally available

#### Data Connectivity:

• Snowflake connector general availability

#### Query Editing:

• Add Column from Examples further enhancements.

Let's take a look at each of these in turn.

#### New table and matrix visuals are now generally available

The recent table and matrix visuals that were previously released in preview are now generally available. These new visuals support cross-highlighting and drilling, as well as many new formatting capabilities including data bars and word wrapping.

Now that the visuals are generally available, you'll only see the icons for the new table and matrix visuals. If you have a report that is still using the previous table and matrix visuals, you'll be greeted by Power BI Desktop upon opening to upgrade your visuals to take advantage of all of the new features.

	WE'RE BRINGING YOU NEW MATRIX AND TABLE VISUALS
Co car Wi	nvert your old matrix and table visuals by selecting them on the was, then clicking the icons in the Visualizations gallery.
	Cross-highlight data in other visuals with a click of any value or header Drill down into your row or column data, using buttons on the
	visual or right-clicking rows or columns Add data bars to understand and clarify your data
	arn more about new matrix and table visuals

It therefore makes sense to clean up data as much as possible in Power Query, renaming and deleting as required. Although merging some tables and queries in Power Query can be useful to avoid having unnecessary tables (more on this next week), don't try to flatten all the data into one huge table. One of the features of Power Pivot is the ability to manage relationships between tables, allowing keys to be constructed as required. This is vital in creating accurate calculations and useful new columns to aid analysis of data. As with most relationships, Power Query and Power Pivot work well together when they are allowed to do what they are best at.

More next time!

There's three more improvements to table and matrix visuals this month:

- 1. The drill experience has been updated to make it easier to drill on either the rows or columns
- 2. The default style for the table and matrix visual has been updated. The new style makes it easier to read your visual and is based on Microsoft's best practices whitepaper. You can always go back to the "None" option in the formatting pane if you prefer the old appearance

Category	Deluxe	Economy	Regular	Total
Audio	9,956.82	7,773.37	26,015.43	43,745.62
Cameras and camcorders	40,782.27	19,023.88	107,155.54	166,961.69
Cell phones	15,094.30	3,246.84	32,260.33	50,601.47
Computers	234,782.33	59,393.04	284,203.44	578,378.81
Games and Toys	1,980.65	3,275.61	2,169.44	7,425.70
Home Appliances	142,370.31	35,104.94	180,336.25	357,811.50
Music, Movies and Audio Books	5,721.82	690.16	3,219.04	9,631.02
TV and Video	71,690.27	31,938.78	201,167.75	304,796.80
Total	522,378.77	160,446.62	836,527.22	1,519,352.61

3. There's another update to word wrapping. Microsoft now honours new lines in content, either when it's in the data you load from your source or if you specify it in a DAX function, *e.g.* 

Measure with newline = "This is the first line" & UNICHAR(10) & "This is the second line"

#### Renaming fields in visuals

You can now rename fields for a specific visual. This allows you to give an "alias" to the column in that specific visual while leaving the actual column name alone. To rename a field in a specific visual, just double click it (or right click and choose 'rename'):



The field will be renamed everywhere it is used in the chart, including the tooltip. Hovering over the name in the field well will show you the original name if you need it for reference. If you want to go back to the original name, you can remove the field from the chart and add it back again. As always, if you want to rename the field for your entire report, instead of in a single visual, you can do that by double clicking that field in the field list.

#### Custom visuals store integration

The custom visuals store has now been brought into Power BI Desktop. From the 'Home' tab on the Ribbon, you can open the store, browse visuals and add them to your Desktop. All the custom visuals that are listed in the Office store are available directly from the Desktop:



Once you click the' From Store' option in the 'Custom visuals' group, you'll see a dialog showing all the visuals available in the Office store. From here you can browse different visual types or search by name for a visual. Click any of the visuals to go to its details page, where you can see screenshots, a video, an overview of the visuals, and user reviews. Once you find a visual you want to use, all you need to do is click 'Add' to include it in your report.



#### **Relative date filters**

Having created the relative date slicer recently, Microsoft has provided the slicer in the filter pane as well. This same functionality you have in the relative data slicer is now available for date filter cards as well.



The Very Hungry Caterpillar visual

#### Responsive layout for visuals (preview)

Now this one is really cool. As a lot of our users view visuals on all manner of screen sizes, it's important to deliver great charts on a large screen while preserving as much of that richness as possible on a small screen too. To address this challenge, Microsoft has created responsive visualizations, which change dynamically to display the maximum amount of data and insight, no matter the screen size. It is similar to how the Ribbon is displayed in different screen settings / resolutions.





When your visuals are set to be responsive, they will dynamically update as you resize them, removing padding and other sections of the chart as necessary to make sure the most important information, the data itself, is preserved. This is particularly powerful when created phone reports and mobile dashboards.

Right now, this feature is in preview for the following visual types:

- Stacked bar chart
- Stacked column chart
- Clustered bar chart
- Clustered column chart
- 100% stacked bar chart
- 100% stacked column chart
- Line chart
- Area chart
- Stacked area chart
- Line and stacked column chart
- Line and clustered column chart
- Waterfall chart
- Scatter chart

Even though this feature is still a preview, this new option will trigger automatically, without having to enable it in the 'Options' dialog. You can turn it on / off using the '(Preview) Responsive' option in the 'General' card of the formatting pane:

SalesAmount by Year, Quarter a	∧ General	
2M	(Preview) Responsive	On
ом	X Position	1088
	Y Position	208

#### New waterfall chart option - breakdown

A common question when analysing data is wanting to understand why something has increased or decreased. To make this process easier, this update has added a new field well option to the waterfall chart, called breakdown. When you put a dimension field in this new bucket, Power BI Desktop will show you what values in that field were the big causes of increase and decrease between each neighbouring category in the waterfall chart.



By default, this feature will show you the top five differences and an 'Other' bucket that groups all the other values together. However, you are able to adjust how many values you want to see before grouping into an 'Other' bucket in the formatting pane *viz*.



#### Custom visual updates: Drilldown Choropleth

This sounds like a place in Wales. It's not though. Drilldown Choropleth displays each location on a map filled with a colour based on the value for each location. This is similar to the Shape map preview visual in that you use your own custom map files. This gives you control over how the map looks. You can use drill to move between geographical hierarchies, showing different map files at each level:



#### Custom visual updates: Drilldown Cartogram

Similar to Drilldown Choropleth, but with a "bubble look", this map has the same custom map files and drilldown features, but displays a circle for each location with the size and colour based on the values specified.



#### Custom visual updates: Drilldown Player

The Drilldown Player visual lets you filter or highlight your report automatically. You can add a categorical or numeric column to the visual and press play to see each value from the column applied to the rest of the report. This visual supports hierarchies as well, so you can add multiple columns to the visual to support playing through multiple fields. Using the 'Edit interactions' feature, you can control if the player will filter or cross-highlight the other visuals on your report.



#### Custom visual updates: Certified custom visuals

Custom visuals can now be "certified"! We hate to point out that "certified" means to guarantee with 100% effectiveness. We think they are talking about certification! Anyway, certified custom visuals are custom visuals that conform to the best practices of custom visuals development as defined by Microsoft and verified by the Power BI custom visuals certification team. You can always tell when a company has become too large when it starts creating these sorts of teams (no offence intended). These best practices range from performance to security to usability. Once a visual has been certified, it can be exported to PowerPoint and will show in subscription emails.



The following visuals have been certified so far:

- Bullet Chart
- Chiclet slicer (we like this one!)
- Dual KPI
- Timeline slicer.

If you want to be certified (!), feel free to get in touch with Microsoft...

#### Quick Measures from the community

The Power BI community has been busy submitting ideas for new quick measures (along with its DAX!) to Microsoft. They have integrated two of those measures so far into Power BI Desktop. You can find these two new measures under the 'Text' category in the Quick measures dialog:

#### Star rating

This quick measure will visualise your data as a number of stars between a given minimum and maximum for your measure.

ard	Data • Sources • 1 Ext	ernal data	Resources	Calculation
-			=	Star rating 🔻
Categ	jory	SalesAmount	SalesAmount star rating	Convert a numeric value into a variable star rating. Originally suggested by Chris Webb through the guick
Game	es and Toys	196,762.93	****	measures gallery. Learn more
Music	, Movies and Audio Books	257,624.54	***	
Audio	)	844,329.62	****	Base value 🛈
Cell p	hones	1,358,189.95	* ☆☆☆☆	
Carne	ras and camcorders	4,218,323.51	**☆☆☆	Sum of SalesAmount * ×
TV an	d Video	6,082,047.70	*****	
Home	e Appliances	9,564,741.18	*****	Number of stars ①
Comp	outers	11,539,852.53	*****	Humber of stars o
Total		34,061,871.96	****	5
				Value for lowest star rating ①
				100000
				Value for highest star rating ①
				12000000

#### Concatenated list of values

This quick measure will concatenate you dimensions into a comma separated list. You can also decide how many values will be concatenated before truncating it with an "*etc.*" Grammar guardians turn in your graves now.

d Ext	ternal data	Resources	Insert	Custom vi	Calculation	
		-			Calculation	
Category	SalesAmount	List of SubCategory values			Concatenated list of values	
(anyth)		to or proceedings of the set			Create a comma separated list of distin	ct values in a
Games and Toys	196,762.93	Boxed Games, Download Games			column. When more values exist than t	he number
Music, Movies and Audio Books	257,624.54	Movie DVD			specified below, truncate and show 'et-	at the end of
Audio	1,165,188.00	Bluetooth Headphones, MP4&MP3, R	Economyrding Pen		the list. Originally suggested by Devin I	Cnight in the
Cell phones	1,358,189.95	Cell phones Accessories, Home & Off	ice Phones, Smart phone	is & PDAs, etc.	quick measure gallery. Learn more	
Cameras and camcorders	4,457,032.01	Camcorders, Cameras & Camcorders	Accessories, Digital Cam	eras, etc.		
TV and Video	8,155,110.86	Car Video, Home Theater System, Tele	evisions, etc.		Field ()	
Home Appliances	9,564,741,18	Air Conditioners, Coffee Machines, Fa	ns, etc.		There of	
Computers	15,486,323.95	Computers Accessories, Desktops, Lag	ptops, etc.		SubCategory	3
Total	40,640,973.42	Air Conditioners, Bluetooth Headpl	hones, Boxed Games, e	tc.	Succurry	
					Number of values before trur	ication O
6 T		_				
					3	
					200	

If you think you can do better, start writing your own measures now!

#### Bidirectional cross filtering for DirectQuery is now generally available

Microsoft released bidirectional cross filtering for DirectQuery models as a preview a few months ago: it's now making it generally available for everyone (isn't that what "generally available" means?). This means that bidirectional cross filtering is generally available for both Import and DirectQuery models, including the use of bidirectional filtering for defining row level security.

For those who don't know (everyone?), bidirectional cross-filtering is a new feature for SQL Server 2016 Analysis Services and Power BI Desktop that allows modellers to determine how they want filters to flow for data using relationships between tables. It's complicated, but understood, it can help you solve the many-to-many linking problem between tables without writing complicated DAX formulae.

When using this feature, you need to consider the performance implications and it is recommended that if you don't understand it, it may be safer to play with small datasets before going crazy.

#### Snowflake connector general availability

With this month's update, the Snowflake connector is now Generally Available and working in the Power BI Service via the On-Prem Data Gateway.



The Snowflake connector can be found under the 'Database' category within the 'Get Data' dialog. It allows you to create reports based on Snowflake data, either by using Import or DirectQuery modes:

Snowflake	^
Server	
Example: contoso.snowflakecomputing.com	
Warehouse	
Example: CONTOSO_WH	
Data Connectivity mode ①	
Import	
O DirectQuery	
	OK Cancel
	Carcer

#### Add Column from Examples further enhancements

Finally, there's added support for "a few" additional Number and Date / Time / Timezone data transformations when using "Add Column from Examples". We have dug into this a little bit and all we can see is the ability to change the time to local time. Perhaps that's what "a few" means.

## June 2017 Updates for Get & Transform / Power Query add-in (this time for real!)

The June updates finally came out - in July!! They were too late for our last newsletter, but let's go through them here.

For this month's updates for Get & Transform (Excel 2016) / Power Query (Excel 2010 and 2013), there's eight new updates:

- Add Column by Example
- Split Column (by Delimiter / Number of Characters) into rows
- Basic mode for Group By operation
- Extract Text Before / After / Between Delimiters
- Unpivot Only Selected Columns
- Combine Files experience ability to reference first file as example
- New Go to Column in Query Editor
- SAP HANA Connector enhancements to Parameter Input UX.

Let's take a look at each in turn.

#### Add Column by Example

With this update, there's a new capability to the Query Editor that allows you to create a new column by specifying a set of examples of the desired output. Based upon these examples, Excel automatically detects and applies the required transformations.

This is an innovative approach to defining query steps within the Query Editor, which simplifies the process if you are still relatively new to the software, as you no longer need to come up with an algorithm or develop some complex logic for how to transform or extract data from other columns or how to define those transformations in the Query Editor. Essentially, it's Flash Fill for Power Query!

	- =				ListOfSt	ates - Quer	y Editor		-	
File	н	ome Transform	Add Column	View						^ (
Column Examp	From les *	Custom Invoke Custom Column Function General	Conditional Index Colur Conditional	I Column mn - Column	Format Format Format	Statistics Star	ard Scientific From Number	Date Time	Curation Time	
Queries V		Add Column From Enter sample values Transform: Date.Mol	Examples to create a ne nthName(Date.	w columr From([#*	n (Ctrl+Enter to apply). Statehood[A]"]))		OK	Cancel	Query Settings	
		ABC State & postal a	bbr A <sup>B</sup> c s	Statehood	I[A] ABc State & post	ta A <sup>8</sup> c Ci	Month Name from Stateho	od[A]		
	1	Alabama	Dec.	14, 1819	AL	Monta	December			
	2	Alaska	Jan. 1	3, 1959	AK	Junear		^	A ADDI JED CTEDS	
	3	Arizona	Feb.	14, 1912	AZ	Phoen	February			
	4	Arkansas	Jun.	15, 1836	AR	Little	June	_		
	5	California	Sep.	9, 1850	CA	Sacrar	September			
	6	Colorado	Aug.	1, 1876	co	Denve	August			
	7	Connecticut	Jan. 9	9, 1788	ст	Hartfo	January			
	8	Delaware	Dec.	7, 1787	DE	Dover	December			
	9	Florida	Mar.	3, 1845	FL.	Tallah	March			
			lan.	2, 1788	GA	Atlant	January			
	10	Georgia								
	10 11	Georgia Hawaii	Aug.	21, 1959	н	Honol	August			
	10 11 12	Georgia Hawaii Idaho	Aug. Jul. 3	21, 1959	HI	Honol Boise	August July	~		

#### Split Column (by Delimiter / Number of Characters) into rows

There's a new option in the 'Split Column by Delimiter' and 'Split Column by Number of Characters transformation' dialogs that allows you to specify whether to split into new columns (OK, that's "old school") or split into new rows.

This new option can be found under the 'Advanced Options' section in these two dialogs:

×	X
Split Column by Delimiter	Split Column by Number of Characters
Specify the delimiter used to split the text column.	Specify the number of characters used to split the text column.
Select or enter delimiter Space *	Number of characters
Split at Split at the other of the second s	Split Once, as far left as possible Once, as far left as possible # Repeatedly
Advanced options     Split into     Kourns     Rows Number of columns to split into     3	Advanced options     Split into     Kodumns     Nomber of columns to split into
Quote Character	OK Cred
Insert special character *	
OK Cancel	

#### Basic mode for Group By operation

The new 'Basic' mode in the 'Group By' transform dialog simplifies how you may group by a single column and define a single output column. You can switch between 'Basic' and 'Advanced' modes within the 'Group By' dialog by selecting the desired option at the top of the dialog *viz*.

Basic      Advanced					
Specify the column to grou	p by and the desired output.				
Group by					
OrderDateKey	*				
New column name	Operation		Column		
Profit	Sum	*	SalesAmount	*	

#### Extract Text Before / After / Between Delimiters

Also in this update, there's a new option to extract all text before, after or between delimiters from a Text column. These new commands are located under the 'Extract' drop-down menu on the 'Transform' and 'Add Column' tabs on the Query Editor Ribbon:

X 🗄   🙂		1								Stores -	Query Edi
File	÷	lome	Transform Ad	d Col	umn View						
Group By	Use F As He	irst Row eaders •	Transpose	Dat	a Type: Text • Detect Data Type Rename	1,9 1 1,9 1	Replace Values • 🖓 Fill • 🛛 📜 Pivot Column	Unpivot Co Move • Convert To	lumns •	Length	Columns Sta
		Tabl	e				Any Column			First Characters	
>		Store	Description	٣	A <sup>B</sup> <sub>C</sub> Status	٣	A <sup>B</sup> C OpenDate	•	Clos	Last Characters	<b>v</b> 1 <sup>2</sup>
	1	ntoso Se	eattle No.1 Store		On		4/12/2004			Text Refore Delimiter	635
sries	2	ntoso Se	attle No.2 Store		On		2/14/2004			Text After Delimiter	636
Que	3	ntoso Ke	ennewick Store		On		2/12/2004			Text Arter Delimiter	934
	4	ntoso Be	ellevue Store		On		3/1/2004			Text Between Delimiters	638
	5	ntoso Re	edmond Store		On		4/2/2004			null	639
	6	ntoso Ya	akima Store		On		5/15/2005			null	640
	7	ntoso G	ranger Store		On		6/16/2004			null	641

#### Unpivot Only Selected Columns

Another new transform was added under the 'Unpivot Column's menu in Query Editor that allows you to unpivot only the currently selected columns in the Query Editor preview. This generates an <u>explicit</u> columns list in the current step so that the same set of columns is unpivoted on future refresh operations (*i.e.* the columns to be unpivoted are cited in the **M** code).

x 🛛   🙂		[								I	Nes
File	н	Iome Transform	Ad	dd Column View							
Group By	Use F As He	irst Row eaders • Table	e Rows ws	Data Type: W	Data Type: Whole Number • 1, 2 Replace Values • 🖓 Unpivot Column Detect Data Type Rename Unpivot Columns Unpivot Other Columns Unpivot Only Selected Columns					Split Column	Fr
>		A <sup>B</sup> <sub>C</sub> Country	1 <sup>2</sup> 3	Year 💌	1 <sup>2</sup> 3 E	Translate only t	the c	urrently selected	1 <sup>2</sup> 3 Apparel	¥	1 <sup>2</sup> 3
	1	US		2012		17093575 0005		ouosoul	207	26381	
eries	2	US		2013	2013 1795683		835	8031028	225	49438	
Que	3	US		2014		79621	129	4680494	103	26588	
	4	Canada		2012		13157183 865670		8656701	76	30209	
	5	Canada		2013		13802239 166		16603614	147	98106	
	6	Canada		2014		233769	915	7335867	83	27682	
	7	UK		2012		33925	569	7681342	83	18908	
	8	UK		2013		164914	177	16992555	22	17520	
	9	UK		2014		48594	144	1560422	211	68747	

In addition to the newly added 'Unpivot Only Selected Columns' option, do remember you can already apply one of the following commands from the Unpivot Columns menu:

- Unpivot Columns: This operation will unpivot all columns except the non-selected ones. This case is optimised for scenarios where new columns that appear in the future need to be unpivoted as well. For example, datasets where new columns represent data for new dates (*e.g.* monthly sales, weekly occurrences).
- Unpivot Other Columns: This operation provides the same capability as 'Unpivot Columns' in terms of future behaviour with respect to new columns appearing in the table. The main difference with 'Unpivot Columns' is that it allows you to select the columns that should not be unpivoted. This case helps you where the number of columns that should not be unpivoted is much smaller than the number of columns that should be unpivoted, similar to the behaviour of 'Remove Other Columns' compared to 'Remove Columns'.

#### Combine Files experience — ability to reference first file as example

'Combine Files' continues to be improved. This latest update allows you to always reference the first file in a folder as the example file. Before this update, you had to pick a specific file by name, which might cause errors in the future if such file is removed from the folder.

With this update, you can select 'First file' in the 'Combine Files' dialog, which will ensure that the first file in the folder is used as the example, regardless of the specific file name.

xample File: First file	*	]					
٩	Sheet1	-					G
Display Options *	Column1	Column2	Column3	Column4	Column5	Column6	Col
🖌 💼 Sample File Parameter1 [1]	Seattle	null	null	Portland	null	null	Var
💭 Sheet1	Bikes	Accessories	Miscellaneous	Bikes	Accessories	Miscellaneous	Bik

#### New Go to Column in Query Editor

When working with tables that have many columns, it is hard to scroll in the Query Editor preview to find the column that you want to apply transformations to. This release provides a new 'Go to Column' command on the 'Home' tab of the Query Editor Ribbon that allows you to search within the list of columns and select the column more easily.

x 🔢   🙂	• =								FL_insurance_samp
File	Hom	Transform	Add Column	View					
Close & Load •	Refre	Advanced Edi	itor Choose Columns	Remov	e Keep R s * Rows * R	temove Rows •	2↓ X↓	Split Group L Column - By	ta Type: Any - Use First Row As Headers - Replace Values
Close		Qu Choo	se Columns	Columns	s Reduce	Rows	Sort	Т	ransform
>	12	3 policy	Column	Y	A <sup>B</sup> <sub>C</sub> county	¥	1.2	eq_site_limit 💌	1.2 hu_site_limit 💌 1
	1 Se	ect the column that y	ou would		CLAY COUNT	Y		498960	498960
eries	2 pre	e to go to in the Quer eview.	y Editor		CLAY COUNT	Y		1322376.3	1322376.3
Que	3	206893	FL		CLAY COUNT	Y		190724.4	190724.4
	4	333743	FL		CLAY COUNT	Y		0	79520.76
	5	172534	FL		CLAY COUNT	Y		C	254281.5
	6	785275	FL		CLAY COUNT	Y		C	515035.62
	7	995932	FI		CLAY COUNT	v		0	19260000

#### SAP HANA Connector—enhancements to Parameter Input UX

The Parameter Input UX for the SAP HANA connector has been improved in a couple of ways:

- You can now filter down the list of parameters to only required parameters
- Microsoft has moved away from drop-down menus for single / multi-selection input controls and started using a popup dialog for both scenarios. This new dialog allows users to see both the ID and Caption for each parameter value, as well as search within the list of values by any of these two fields. This makes it easier to provide input values, as opposed to before, which only allowed input IDs.

These updates are available as part of an Office 365 subscription. If you have Excel 2010 or Excel 2013, you can also take advantage of these updates by downloading the latest Power Query for Excel add-in.

You can find out more about Power Query, Power Pivot and Power BI on one of our training courses. Visit www.sumproduct.com/courses for more information and to book today.

## STOP PRESS!! July Updates for Get & Transform (Excel 2016) Only

For once, we can report on some **Get & Transform** updates on time! Just before our printing deadline – and we mean *just* before! – Microsoft has announced further updates to data importing and shaping in Excel 2016. Essentially, the Ribbon has been rearranged for the 12,000<sup>th</sup> time *viz*.



These updates are available as part of an Office 365 subscription beginning with Current Channel Version 1704 (Build 8067.2115). Some readers may think these changes are old hat; indeed, this rearrangement has been around a while already on Insider builds.

However, there are some revisions that are definitely welcomed. Aside from the common sources (text / CSV, web and Tables / ranges), there are the 'Get Data' dropdown menu and the highly useful 'Recent Sources'.

The former is similar to before:



Check out the 'Legacy Wizards' here – for those of you not in a rush to update the next big thing. They're not deprecated yet, although admittedly, they are getting more and more hidden (hint, hint).

The latter is new though. Excel users often establish a set of frequently used sources they import data from. With this update, you can easily create a query from one of your recently used data sources by clicking on the **Data > Recent Sources** command. You can then browse through your recently connected sources, select one, and then click 'Connect' to continue with the import flow.



Another popular scenario involves sharing your workbook queries with other people in your organisation. With this update, it is now possible to import and export queries via the Office Database Connection (ODC) mechanism.

To export a query definition into an ODC file, right click on a query in the 'Queries & Connections' side pane and choose the 'Export Connection File' command. The created ODC file will contain the definition of your

query including the connectivity instructions to the data source and the transformation steps being applied on your data.

Once you receive an ODC file, you will be able to use it and import the query definition into your workbook. To create query and import data using the existing ODC file, use the 'Existing Connections' dialog opened by clicking on the **Data > Existing** Connections button:

Existing Connections	?	×
Select a Connection or Table		
Connections Tables		
Show: All Connections		
Connection to the 'TransactionLogs' query in the workbook.		^
Query from MS Access Database [Blank]		
Connection files on the Network		-
<no connections="" found=""></no>		
Connection files on this computer		
Adventure Works DW		
ContosoSales DimDate.od [Blank]		
ContosoSales FactSales.od [Blank]		
ContosoSales FactSales2.od		
dany-srv AdventureWorks Adventure Works [Blank]		~
Browse for More	Ca	ncel

Finally, with this update, Microsoft has now introduced a consolidated management experience for workbook queries and connections. In this new unified section for queries and connections, you can now access everything through the dedicated 'Queries & Connection' side pane. To open the side pane, click the **Data > Queries & Connections** button:



Clicking on the 'Queries' tab at the top of the side pane allows you to browse and manage the available queries in your workbook. Right-click on a query, you can access the query's context menu allowing you to perform additional actions such as manage query properties, refresh query data from the underlying source, edit query transformations with Query Editor *etc*. In a similar manner, clicking on the 'Connections' tab at the top of the side pane allows you to browse and manage the available legacy connections in your workbook that are associated with one of the legacy wizards such as legacy 'From Text', 'From Analysis Services' or 'From Microsoft Query'. Right-clicking on a connection accesses the connection's context menu that allows you to refresh connection data from source, delete connection or manage connection properties.

## The A to Z of Excel Functions: BITAND

Now this is more like it. Finally, we get to functions used all of the time by your typical Excel user. Not.

This function returns a bitwise '**AND**' of two numbers. For those of us without PhD's in IT, this means that the value of each bit position (the corresponding number reading from right to left when represented in binary) is counted only if both parameter's bits at that position are 1.

The **BITAND** function employs the following syntax to operate:

#### BITAND(number1, number2)

The **BITAND** function has the following arguments:

- number1: this is required and must be in decimal form, greater than or equal to 0.
- number2: also required. This too must be in decimal form and greater than or equal to 0.

It should be further noted that:

- BITAND returns a decimal number
- the result is a bitwise 'AND' of its parameters
- the value of each bit position is counted only if both parameter's bits at that position are 1
- the values returned from the bit positions progress from right to left as powers of 2. The rightmost bit returns 1 (2^0), the bit to its left returns 2 (2^1), and so on
- if either argument is less than 0, BITAND returns the #NUM! error value
- if either argument is a non-integer or is greater than (2^48)-1, BITAND returns the #NUM! error value
- if either argument is a non-numeric value, BITAND returns the #VALUE! error value.

Here's some examples:

	А	В	С	D
1		Decimal	Binary	
2		1	1	
3		5	101	
4		13	1101	
5		25	11001	
6				
7				
8	Formula	Result	Description	How It Works
			Compares the binary	The binary representation of 1 is 1 and 5 is 101 (see above).
			representations of 1	Their bits only match at the rightmost position. This is returned
9	=BITAND(1,5)	1	and 5	as 2^0 or 1.
			Compares the binary	The binary representation of 5 is 101 and 13 is 1101 (see above).
			representations of 5	Their bits match at the rightmost and third from right position.
10	=BITAND(5,13)	5	and 13	This is returned as 2^2 + 2^0 or 5.
			Compares the binary	The binary representation of 13 is 1101 and 25 is 11001 (see
			representations of 13	above). Their bits match at the rightmost and fourth from right
11	=BITAND(13,25)	9	and 25	position. This is returned as 2^3 + 2^0 or 9.
10				

## The A to Z of Excel Functions: BITLSHIFT

And here's another one of the most commonly used functions on the planet. If the planet is Uranus. This function returns a number shifted left by the specified number of bits. For those of us who have social lives, this means that you first convert the number to binary and then add on a specified number of zeros before converting the new binary number back to a decimal number.

The **BITLSHIFT** function employs the following syntax to operate:

#### BITLSHIFT(number, shift\_amount)

The **BITLSHIFT** function has the following arguments:

- number: this is required, and must be an integer greater than or equal to 0
- shift\_amount: this is also required. The shift\_amount must be an integer.

It should be further noted that:

- shifting a number left is equivalent to adding zeros (0) to the right of the binary representation of the number. For example, a two-bit shift to the left on the decimal value 4 converts its binary value (100) to 10000, or 16 in decimal
- if either argument is outside their constraints, BITLSHIFT returns the #NUM! error value
- if number is greater than (2^48)-1, BITLSHIFT returns the #NUM! error value
- if the absolute value of shift\_amount is greater than 53, BITLSHIFT returns the #NUM! error value
- if either argument is a non-numeric value, BITLSHIFT returns the #VALUE! error value
- a negative number used as the **shift\_amount** argument shifts the number of bits to the right
- a negative number used as the shift\_amount argument returns the same result as a positive shift\_amount argument for the BITRSHIFT function.



## The A to Z of Excel Functions: BITOR

Are you starting to get used to these functions now, well a BIT anyway (get it)? This function returns a bitwise '**OR**' of two numbers. In this variant, this means that the value of each bit position (the corresponding number reading from right to left when represented in binary) is counted if any of the parameter's bits at that position are 1.

The **BITOR** function employs the following syntax to operate:

#### BITOR(number1, number2)

The **BITOR** function has the following arguments:

- number1: this is required and must be in decimal form, greater than or equal to 0
- number2: also required. This must be in decimal form and greater than or equal to 0.

It should be further noted that:

- the result is a bitwise 'OR' of its parameters
- in the result, each bit position is 1 if any of the parameter's bits at that position are 1
- the values returned from the bit positions progress from right to left as powers of 2. The rightmost bit returns 1 (2^0), the bit to the left returns 2 (2^1), and so on
- if either argument is outside their constraints, BITOR returns the #NUM! error value
- if either argument is greater than (2^48)-1, **BITOR** returns the #NUM! error value
- if either argument is a non-numeric value, **BITOR** returns the #VALUE! error value.

More examples:



## The A to Z of Excel Functions: BITRSHIFT

It's time to find thee antidote to the above **BITLSHIFT** function and you shouldn't feel bitter (**BITR**?). This function first converts the number to binary and then removes a specified number of digits from the right of the binary number, *i.e.* this function returns a number shifted right by the specified number of bits.

The BITRSHIFT function employs the following syntax to operate:

#### BITRSHIFT(number, shift\_amount)

The **BITRSHIFT** function has the following arguments:

- Number: this is required and must be an integer greater than or equal to 0.
- shift\_amount: also required. This must be an integer.

It should be further noted that:

- shifting a number right is equivalent to removing digits from the rightmost side of the binary representation of the number. For example, a two-bit shift to the right on the decimal value 13 converts its binary value (1101) to 11, or 3 in decimal
- if either argument is outside its constraints, BITRSHIFT returns the #NUM! error value
- if **number** is greater than (2^48)-1, **BITRSHIFT** returns the #NUM! error value
- if the absolute value of shift\_amount is greater than 53, BITRSHIFT returns the #NUM! error value
- if either argument is a non-numeric value, BITRSHIFT returns the #VALUE! error value
- a negative number used as the shift\_amount argument shifts the number of bits to the left
- a negative number used as the shift\_amount argument returns the same result as a positive shift\_amount argument for the BITLSHIFT function.

Penultimate example:

	А	В	С	D
1		Decimal	Binary	
2		1	1	
3		5	101	
4		20	10100	
5		80	1010000	
6				
7				
8	Formula	Result	Description	How It Works
			Shifts bits right for the	The value in cell B3 (5) is represented as 101 in binary.
			number by striping the	Removing the last two digits (bits) turns the binary number
9	=RITRSHIFT(R3 2)	1	specified rightmost digits of	into 1 which is 1 in decimal.
	-5111151111 ((55)2)	-	specifica fightificat algres of	
	-51113/11/(53)2)	-	the number represented in	80 is represented as 10100000 in binary. Removing the last two
	-511151#11(55,2)	-	the number represented in binary. This is then	80 is represented as 10100000 in binary. Removing the last two digits (bits) turns the binary number into 10100 which is 20 in
10	=BITRSHIFT(80,2)	20	the number represented in binary. This is then converted back to decimal.	80 is represented as 10100000 in binary. Removing the last two digits (bits) turns the binary number into 10100 which is 20 in decimal.

## The A to Z of Excel Functions: BITXOR

Our final function for this month returns a bitwise 'XOR' of two numbers (XOR was first introduced in Excel 2013 and at the current rate of publishing these articles we should get to this one by 2044). Essentially, **BITXOR** converts two numbers to binary expressions and compares the digits at each position from right to left. If the values are <u>not</u> equal, the function returns a 1 for that position (bit). For each 1, its position is ascertained and converted to a power of 2 (2^0 for the rightmost position, 2^1 for the value to its left, 2^2 for the value to the left of this and so on). These corresponding powers of two are then summed.

The **BITXOR** function employs the following syntax to operate:

#### BITXOR(number1, number2)

The **BITXOR** function has the following arguments:

- number1: this is required and must be greater than or equal to 0.
- number2: also required. This must be greater than or equal to 0.

It should be further noted that:

- BITXOR returns a decimal number that is the result of the sum of a bitwise 'XOR' (exclusive XOR) of its parameters
- if either argument is outside its constraint, **BITXOR** returns the #NUM! error value
- if either argument is greater than (2^48)-1, BITXOR returns the #NUM! error value
- if either argument is a non-numeric value, BITXOR returns the #VALUE! error value
- in the result, each bit position is 1 if the values of the parameters at that bit position are not equal; in other words, one value is 0 and the other is 1. For example, using **BITXOR(5**,3), 5 is expressed as 101 in binary and 3 as 11 in binary. To help with comparison, you can consider 3 as 011. From right to left, the bit values at the three positions in this example are the same (1) only at the rightmost position. A 'not equal' result returns a 1 for the second and third positions from the right, and an 'equal' result returns 0 for the rightmost position

- values of 1 returned from the bit positions progress from right to left as powers of 2. The rightmost bit returns 1 (2^0), the bit to the left returns 2 (2^1), and so on
- using the same example, 0 is returned for the rightmost bit position because it is a 0, 2 (2^1) is returned for the second bit position from the right (a 1 value), and 4 (2^2) is returned for the leftmost bit (also a 1 value). The total is 6, in decimal representation.

Here's the final illustration:

	А	В	С	D
1		Decimal	Binary	
2		1	1	
3		5	101	
4		8	1000	
5		13	1101	
6		20	10100	
7		25	11001	
8				-
9				
10	Formula	Result	Description	How It Works
				The binary representation of 1 is 1 or 001 (for comparison) and
				5 is 101 (see above). Only the leftmost digit is different so the
11	=BITXOR(1,5)	4		value returned is 2^2 or 4.
			Returns the value of the bitwise	The binary representation of 5 is 101 or 0101 (for comparison)
			'Exclusive OR' comparison at each	and 13 is 1101 (see above). Only the leftmost digit is different
12	=BITXOR(5,13)	8	bit position	so the value returned is 2^3 or 8.
				The binary representation of 13 is 1101 or 01101 (for
				comparison) and 25 is 11001 (see above). The first and third
13	=BITXOR(13,25)	20		digits are different so the value returned is 2^4 + 2^2 or 20.
14				

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Location	Course	Date	Duration
Sydney	Financial Modelling	1st - 2nd Aug 2017	2 days
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Adelaide	Financial Modelling	15th - 16th Aug 2017	2 day
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Melbourne	Power Pivot, Power Query and Power Bl	12th - 14th Sep 2017	3 days
Sydney	Excel Tips & Tricks	25th Sep 2017	1 day

Sydney	Financial Modelling	26th - 27th Sep 2017	2 days
Sydney	Power Pivot, Power Query and Power Bl	16th - 18th Oct 2017	3 days
Melbourne	Excel Tips & Tricks	23rd Oct 2017	1 day
Melbourne	Financial Modelling	24th - 25th Oct 2017	2 days
Sydney	Visual Basic for Applications	6th Nov 2017	1 day
Sydney	Excel Tips & Tricks	13th Nov 2017	1 day
Sydney	Financial Modelling	14th - 15th Nov 2017	2 days
Melbourne	Power Pivot, Power Query and Power Bl	4th - 6th Dec 2017	3 days
Melbourne	Excel Tips & Tricks	11th Dec 2017	1 day
Melbourne	Financial Modelling	12th - 13th Dec 2017	2 days

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## **Key Strokes**

Each newsletter, we'd like to introduce you to useful keystrokes you may or may not be aware of. We've finally finished the function keys – Mac users will be pleased:

Keystroke	What it does	
F12	Save As	
CTRL + F12	Open	3
CTRL + ALT + F12	Thai dictionary (!)	
CTRL + SHIFT + F12	Print	
SHIFT + F12	Save	-

There are over 540 keyboard shortcuts in Excel. For a comprehensive list, please download our Excel file a www.sumproduct.com/thought/keyboard-shortcuts. Also, check out our new daily **Excel Tip of the Day** feature on the www.sumproduct.com homepage.

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