

SumProduct

NEWSLETTER #66 - May 2018

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Excel takes centre stage this month...

There's certainly new things to mention: two new data types, a new function, a new error message, enhancements for Mac Excel and two translators.

But that's not all. We wrap up the recent Unlock Excel event, highlight the forthcoming Amsterdam Excel Summit and discuss the latest updates for Power BI Desktop, Service and Mobile.

With the usual regular features such as Power Query Pointers focusing on essential calendar tables, the A to Z of Excel Functions (this month, we review **CONFIDENCE** to a **T!**) and more Keyboard Shortcuts, there's plenty to read.

Until next month.

Liam Bastick, Managing Director, SumProduct



Unlock Excel Summit – Wrap Up



They came, they saw, they went – even having the now obligatory mic-drop (pictured). From left to right, MVPs Gašper Kamenšek, Ken Puls, Liam Bastick, Jon Peltier, Mynda Treacy and Microsoft's Annie Colonna (together with SumProduct's own other MVP Tim Heng in Sydney), the gang provided sessions on charts, dashboards, the new data types (*see below*), financial modelling, Power Everything and VBA.

The biggest success story of the entire event was in Brisbane where one attendee has seen a regular five-and-a-half-hour task become a less than 30-second event. And they say the event doesn't pay for itself!

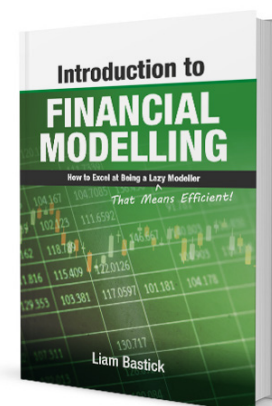
If you were there, we hoped you enjoyed it. If you weren't, make sure you bookmark next year's sessions. The event will be back again in 2019. Watch this space for news on this – and other events – later in the year.

Book Update

From all of us at SumProduct, we were a little overwhelmed by the response to last month's announcement that our book, *Introduction to Financial Modelling*, is soon to come out. Thank you to everyone who has signed up for a copy.

In fact, due to a printing delay, the book is taking slightly longer to be released than we expected last month. Nonetheless, the book will be released shortly and we hope to start shipping the books before the end of this month (May).

If you haven't yet signed up for a copy and would like one (or 50), or would like to find out more, simply drop us a line at contact@sumproduct.com.








New Data Types and FIELDVALUE Function

After all of the endless updates for Power BI and Power Query, there's finally some exciting news for those using Excel 2016 on an Office 365 basis (*i.e.* not the "perpetual licence"). You might not have this initially, but don't fret. According to Microsoft, this feature is being made available to users on a "gradual basis" over several days or weeks. It will first be available to Office Insider participants and later to Office 365 subscribers. If you are an Office 365 subscriber and you want it as soon as it becomes available, do ensure you have the latest version of Office at all times (keep those updates updated!).





So what's the big deal?


Data Type 1: Stocks

	A	B	C
1	Company	Price	Change
2	 JM Smucker Co	\$ 126.04	\$ 1.19
3	 Kellogg Co	\$ 66.29	\$ (0.73)
4	 Post Holdings Inc	\$ 76.76	\$ 0.73
5	 Tyson Foods Inc	\$ 74.29	\$ 0.53
6			

In this graphic, the cells with company names in column A contain the 'Stocks' data type. You may tell this because they have this icon . The 'Stocks' data type is connected to an online source that contains more information. Columns B and C are extracting that information. Specifically, the values for price and change in price are getting extracted from the 'Stocks' data type in column A.

Data Type 2: Geography

	A	B	C
1	Country	Population	Gasoline price
2	 France	66,896,109	\$1.79
3	 Spain	46,443,959	\$1.63
4	 Sweden	9,903,122	\$1.82
5	 Norway	5,232,929	\$2.27
6			

In this example, column A contains cells that have the 'Geography' data type. This time, the  icon indicates this. This data type is connected to an online source that contains more information. Columns B and C are again extracting that information. Specifically, the values for population and gasoline price are getting extracted from the 'Geography' data type in column A.

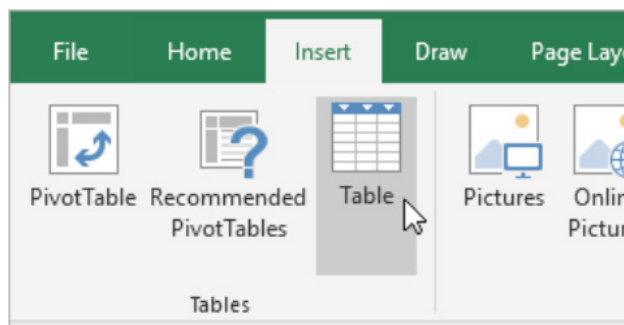
We are sure you can see how these data types might be useful. So how do you set it up? Assuming you have had your version of Excel 2016 updated, it's as easy as, er, 1, 2, 3, 4, 5, 6...

Step 1: Type Some Text

	A	B	C	D
1	Country			
2	France			
3	Spain			
4	Sweden			
5				
6				
7				

That's right: just type some text in cells. In this example, we wanted data based on geography, so we typed country names. However, you could also have typed province names, territories, states, cities, *etc.* If you want stock information, similarly type company names, fund names, ticker symbols, and so on.

Step 2: Create a Table



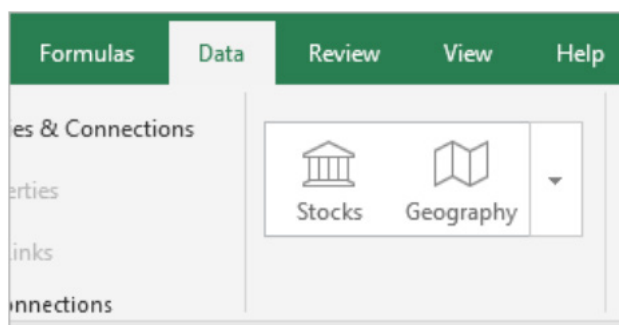
Although it's not required, it is recommended you create an Excel Table. This is so ranges may be extended readily and easily later, should you wish. Select any cell in your data and go to **Insert > Table** or use the keyboard shortcut **CTRL + T**. This will make extracting online information easier later on.

Step 3: Select Some Cells

	A	B	C	D
1	Country			
2	France			
3	Spain			
4	Sweden			
5				
6				
7				




Next, select the cells that you want to convert to a data type.



Step 4: Pick a Data Type



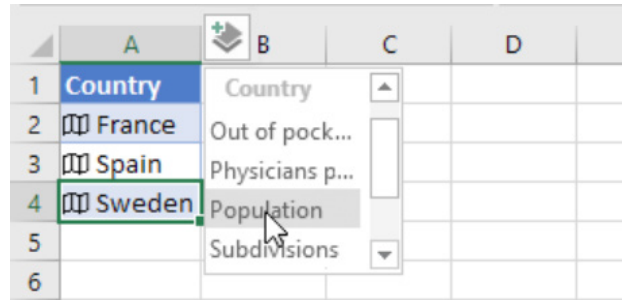
On the 'Data' tab, click either 'Stocks' or 'Geography'.


Step 5: Icons Appear



	A	B	C	D
1	Country			
2	 France			
3	 Spain			
4	 Sweden			
5	An icon indicates the cell contains a data type.			
6				
7				

If Excel finds a match between the text in the cells and the online sources, it will convert your text to either the 'Stocks' data type or 'Geography' data type. You will know immediately if they have been converted since they will have the  icon for stocks and the  icon for geography.

Step 6: Add a Column













Click the 'Add Column' button , and then click a field name to extract more information, such as 'Population'.

If you see the  symbol instead of an icon, then Excel is having difficulty matching your text with data in Microsoft's online sources. Go back and review your data. Correct any spelling mistakes and when you press ENTER, Excel will do its best to find matching information. If this does not work, click  and a 'Selector' pane will appear. Search for data using a keyword or two, choose the data you want and then click 'Select'. That's it!

How to Write Formulae that Reference Data Types

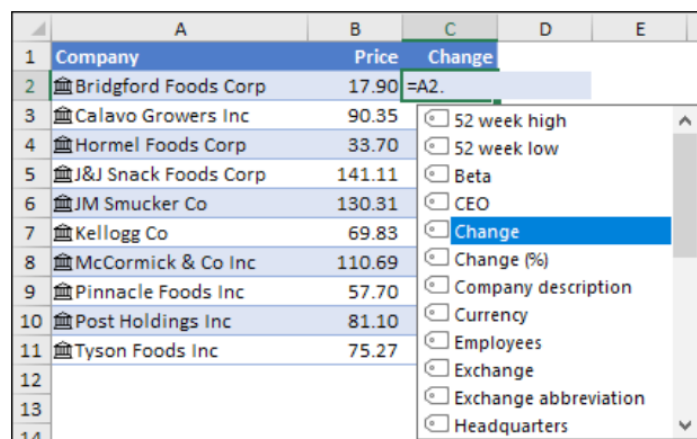
You can use formulae that reference linked data types. This allows you to retrieve and expose more information about a specific linked data type. For example, consider the linked data type, Stocks, used in cells **A2:A11** below. In columns **B** and **C**, there are formulae that extract more information from the 'Stocks' data type in column **A**, viz.

	A	B	C
1	Company	Price	Change
2	 Bridgford Foods Corp	17.90	-3.09
3	 Calavo Growers Inc	90.35	2.35
4	 Hormel Foods Corp	33.70	-0.06
5	 J&J Snack Foods Corp	141.11	-0.69
6	 JM Smucker Co	130.31	0.39
7	 Kellogg Co	69.83	-0.42
8	 McCormick & Co Inc	110.69	0.15
9	 Pinnacle Foods Inc	57.70	0.16
10	 Post Holdings Inc	81.10	0.26
11	 Tyson Foods Inc	75.27	-0.42

In this example, cell **B2** contains the formula `=A2.Price` and cell **C2** contains the formula `=A2.Change`. When the records are in a Table, you can use the column names in the formula instead. In this case, cell **B2** would contain the formula `=[@Company].Price` and cell **C2** would contain `=[@Company].Change`. The additional benefit is that these formulae would automatically copy down too.

Some tips for when you start playing with these two new data types:

- as soon as you type the dot operator (.) after a cell or column reference, Excel will present you with a formula AutoComplete list of fields that you can reference for that data type. Select the field you want from the list or type it if you know it



- data type field references are not case sensitive, so you can enter `=A2.Price`, or `=A2.price`
- if you select a field that has spaces in the name, Excel will automatically add brackets ([]) around the field name, e.g. `=A2.[52 Week High]`
- the **FIELDVALUE** function can also be used, but it is recommended only for creating conditional calculations based on linked data types.

This last point is a nice lead into the other new item...

The FIELDVALUE Function

You can use the **FIELDVALUE** function to retrieve field data from linked data types like the 'Stocks' or 'Geography' data types. There are easier methods for writing formulae that reference data types (*see above*), so the **FIELDVALUE** function should be used mainly for creating conditional calculations based on linked data types.

Similar to the new data types, this brand-new function is being made available to customers on a gradual basis over several days or weeks. It will first be available to Office Insider participants and later to Office 365 subscribers. If you are an Office 365 subscriber, make sure you have the latest version of Office or you may not get the update when it's your turn.

Technical details

Syntax

=FIELDVALUE(value, field_name)

The **FIELDVALUE** function syntax has the following arguments:

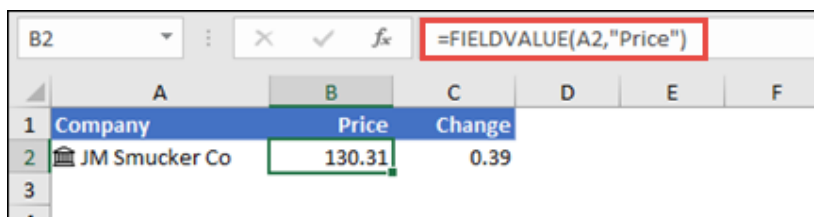
- **value**: this is the cell address, table column or named range that contains a linked data type
- **field_name**: this is the name or names of the fields you would like to extract from the linked data type.

Description

The **FIELDVALUE** function returns all matching fields(s) from the linked data type specified in the value argument. This function belongs to the **Lookup & Reference** family of functions.

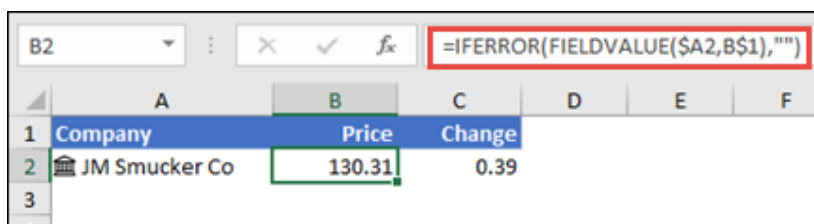
Examples

In the following basic example, the formula, **=FIELDVALUE(A2,"Price")** extracts the **Price** field from the 'Stock' data type for the "internationally-renowned" *JM Smucker Co*.



	A	B	C	D	E	F
1	Company	Price	Change			
2	JM Smucker Co	130.31	0.39			
3						
4						

The next example is a more typical example for the **FIELDVALUE** function. Here, we've used the **IFERROR** function to check for errors. If there isn't a company name in cell **A2**, the **FIELDVALUE** formula returns an error, and in that case, displays nothing (""). However, if there is a company name, then we want the formula to retrieve the **Price** from the data type in **A2** with **=IFERROR(FIELDVALUE(\$A2,B\$1), "")**.



	A	B	C	D	E	F
1	Company	Price	Change			
2	JM Smucker Co	130.31	0.39			
3						
4						

Note that the **FIELDVALUE** function allows you to reference worksheet cells for the **field_name** argument, so the above formula references cell **B1** for **Price** instead of manually entering "Price" in the formula.

Word to the Wise

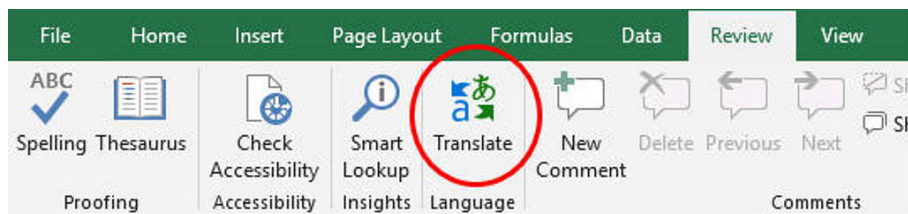
If you try to retrieve data from a non-existent data type field, the **FIELDVALUE** function will return the new **#FIELD!** error. For instance, you might have entered "Prices", when the actual data type field is named "Price". Double-check your formula to make sure you've used a valid field name. If you want to display a list of field names for a record, select the cell for the record and press **CTRL + SHIFT + F2**.

Happy playing with your new toys!

FIELDVALUE will be detailed in our blog series A to Z of Excel Functions in due course. You can find out about other functions in our current list [here](#).

Microsoft Translator for Excel

Bonjour! **FIELDVALUE** *et al* is not all that's happened. There's more. And it's not just for Microsoft Excel, this latest update to the Office 365 "mainstream" collection also works in Word and PowerPoint (there's even an add-in for Outlook too). Located on the 'Review' tab of the Ribbon in the 'Language' grouping (of just one item presently!), 'Translate' allows you to, er, translate from one language to another.



All you have to do is highlight the cell or text you want to translate and then click on the button. In Word or PowerPoint, you will then have to select 'Insert', but in Excel you simply copy the data into the 'Translator' pane.

Se trè fasil pou sèvi ak tradiktè a!

Excel Functions Translator

Not to be confused with the Translator (*above*), the **Excel Functions Translator** is a new add-in that assists users utilise a localised version of Excel by helping translate from the US Excel function names or research how to create a solution on the web with predominately English content.

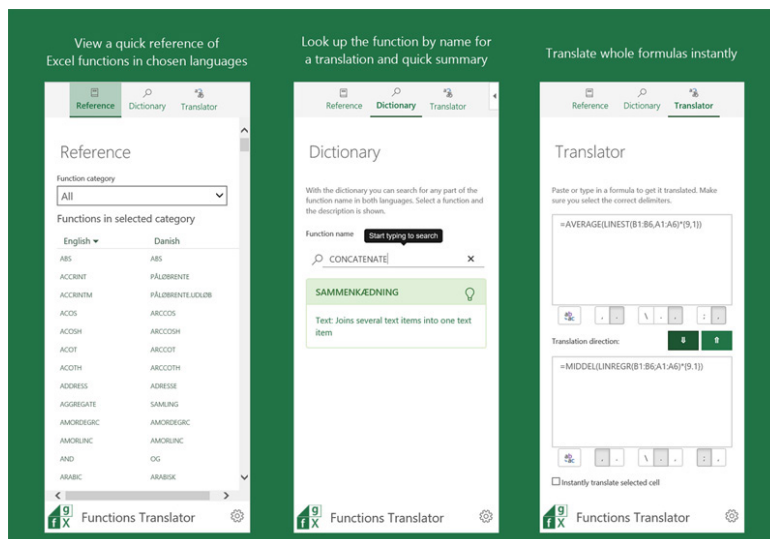


This tool allows non-English Excel users to locate the equivalent localised functions and formulae in any of the (so far) supported 15 languages:

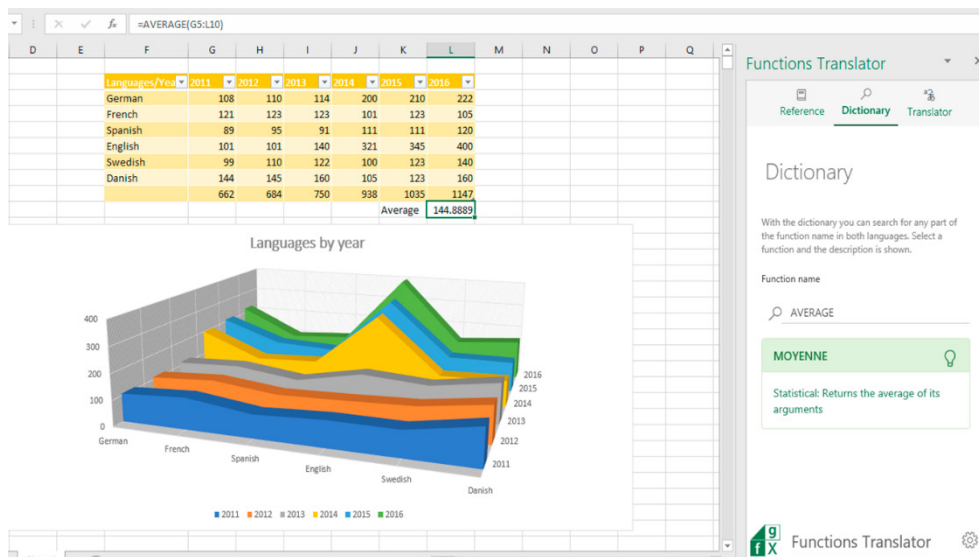
- Chinese Traditional
- Chinese Complex Script
- Danish
- Dutch
- French
- German
- Italian
- Japanese
- Korean
- Portuguese Brazilian
- Russian
- Spanish
- Swedish
- Turkish
- US English (!).

Ironically, one of the primary developers is Ukrainian and this language is not yet on the above list!

Presently, the Functions Translator will automatically configure the language settings to English-US and the localised version. If this is not what you require, it is possible to provide feedback to Microsoft on the translation of functions if it is not what they expected.



The solution supports Excel Online, Excel 2013 and Excel 2016 for Desktop, and the latest version of Excel for Mac and iPad.



Microsoft's "Garage Team", responsible for this add-in, make it clear that this is a Work In Progress. The aim of this tool is to eventually accomplish the following goals:

- enable users who know the English-US functions to become productive in localised versions of Excel
- enable users to easily translate full formulae they find on the web into their native language
- support all localised languages and functions of Excel (80 languages and according to Microsoft, 800 functions although we haven't found that many!)
- provide an efficient way to search for any part of a functions name, in both languages selected
- show a scrollable and categorised list of English-US functions and the corresponding localised functions
- enable the users to give feedback to Microsoft on the quality of the translations of the functions, both good and bad
- enable Microsoft to support users that are struggling with finding the wanted function in a localised language
- support Excel 2013 and 2016 for Desktop, Excel Online, and the latest version of Excel for Mac and iPad.

It's not all there yet, but you can see this road is definitely paved with good intentions. It's taken the team 20 months to get where they are now. Part of this delay is apparently attributable to overcoming Microsoft's own terms and conditions pertaining to security, privacy and accessibility!

If you want the add-in, it's available at the online store now – simply click [here](#) for your copy.

New Features, Functions and Performance in Excel for Mac Version 16

Excel for Mac 2016 version 16.9.0 has been live since the turn of the year, with several since. The version 16 release is powered by the Office Code convergence, i.e. the move towards one Excel for all. It's built from the same codebase as Excel for Windows, while also being integrated with macOS and tailored to Mac UI and capabilities like TouchBar.

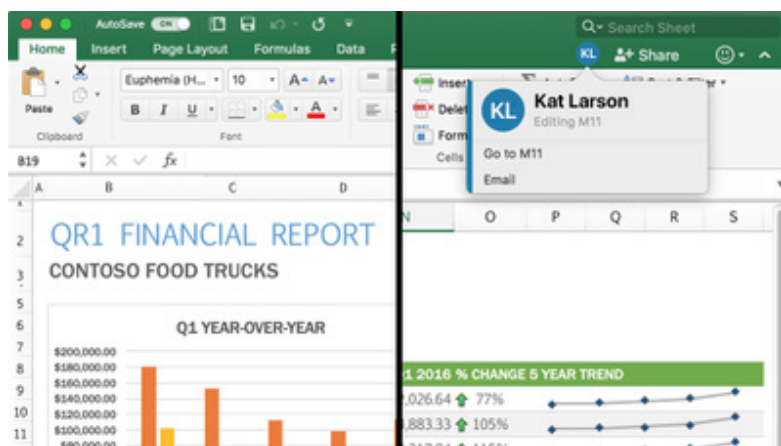
Excel for Mac has a very large and engaged customer base (that we often annoy!), so it is important for Microsoft to keep powering through the

improvements and convergence. Indeed, Microsoft has kept an eye on Excel's UserVoice site, where more than 50% of the Mac features requested (by number of votes) have been implemented. It is important to note that those some of these updates or new features are included only for Office 365 subscribers as the push towards this program continues unabated. Here's a summary of the key features:

Collaborative Editing and AutoSave

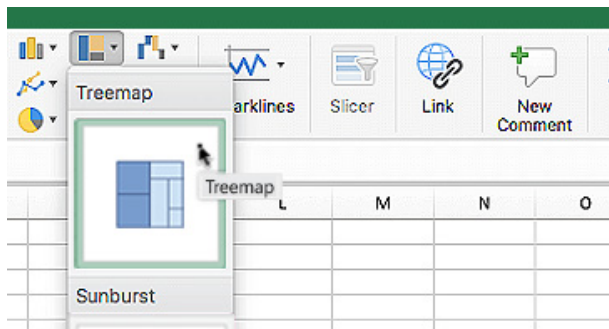
Ah yes, we start with one of our favourites. Not. This feature allows Mac users to work with others at the same time in your workbook (that's fine). The thumbnails in the upper-right corner of the window show who else is viewing or editing the file with you.

However, Excel is now equipped with AutoSave for files stored on OneDrive or SharePoint Online. If you work in modelling, you are going to keep your files away from the Cloud then since AutoSave is exactly what it sounds like: your file is automatically saved every few seconds. We accept that if other people are working in the same file, they can see your changes almost instantaneously. But you don't always want everything saved, although we do accept that if you need to roll back, you can check your file's version history for a list of changes and access earlier copies – but that is a hassle that can be avoided. The thing to remember is we led the crusade to ensure AutoSave may now be switched on and off using a dedicated toggle button in the Ribbon!



More Charts

You can now use the “new” charts (they have been around about three years...), such as funnel, sunburst and histogram, to transform your data into professional visualizations, or use the new Map chart type to transform geographic data into a map to tell a story.



More Functions

There’s a couple of new logical functions, **IFS** and **SWITCH**. Both of these functions have just celebrated their second birthdays in the PC world! Here’s a reminder of what they do.

IFS

As model developers and reviewers, we must confess we are not convinced about this one. If you have ever used a formula with nested IF statements, *e.g.*

=IF(IF(IF...

then maybe this function is for you – however, if you have ever written Excel formulae like this, then maybe Excel isn’t for you! There are usually better ways of writing the formula using **CHOOSE** or **INDEX(MATCH)** (see www.sumproduct.com/thought/index-match.html for more) for example.

The syntax is as follows:

IFS(logical_test1, value_if_true1, [logical_test2, value_if_true2], [logical_test3, value_if_true3],...)

where:

- **logical_test1** is a logical condition that evaluates to TRUE or FALSE;
- **value_if_true1** is the result to be returned if **logical_test1** evaluates to TRUE. This may be empty
- **logical_test2** (and onwards) are further conditions that evaluate to TRUE or FALSE also
- **value_if_true2** (and onwards) are the respective results to be returned if the corresponding logical_test evaluates to TRUE. Any or all may be empty.

Since functions are limited to 254 arguments (sometimes known as parameters), the new **IFS** function can contain 127 pairs of conditions and results.

One thing to note is that **IFS** is not quite the same as **IF**. With the **IF** statement, the third argument corresponds to what do if the **logical_test** is not TRUE (*i.e.* it is an ELSE condition). **IFS** does not have an inherent ELSE condition, but it can be easily generated. All you have to do is make the final **logical_test** equal to a condition which is always trues such as TRUE or 1=1 (*say*).

Other issues to consider:

- Whilst the **value_if_true** may be empty, it must not be omitted. Having an odd number of arguments in an **IFS** statement would give rise to the “You’ve entered too few arguments for this function” error message.
- If a **logical_test** is not actually a logical test (*e.g.* it evaluates to something other than TRUE or FALSE, the function returns an **#VALUE!** error. Numbers still appear to work though: any number than zero evaluates as TRUE and zero is considered to be FALSE.
- If no TRUE conditions are found, this function returns the **#N/A!** error.

To show how it works, consider the following example.

Formula bar: `=IFS(H13="Yes",I13,H14="Yes",I14,H15="Yes",I15,H16="Yes",I16,TRUE,"Not a Guru")`

Criteria	Yes / No	Grade
Already qualified?	Yes	3 Star
Work for Microsoft?		2 Star
Passed exam?	Yes	1 Star
Studying?		Student

Grade Achieved: 3 Star


```
=IFS(H13="Yes",I13,H14="Yes",I14,H15="Yes",I15,H16="Yes",I16,TRUE,"Not a Guru")
```

To be fair, one similar solution using legacy Excel functions isn't any better:

=IF(H13="Yes",I13,IF(H14="Yes",I14,IF(H15="Yes",I15,IF(H16="Yes",I16,"Not a Guru"))))

SWITCH

SWITCH is already available in many alternative programming languages and can simplify potentially horrible formulae. This function evaluates an expression against a list of values and returns the result corresponding to the first matching value. If there is no match, an optional default value may be returned. The syntax is as follows:

SWITCH(expression, value1, result1, [default or value2, result2],...[default or valueN, resultN])

where:

- **expression** is the value that will be compared against the values (**value1** to **valueN**) cited
- **value1** to **valueN** are the values that will be compared against the **expression**
- **result1** to **result** are the values, references or formulae results to be returned when the corresponding **valueN** argument matches the **expression**. The result must be supplied for each corresponding **valueN** argument
- **default** is an optional value to return in case no matches are found in the **valueN** expressions. The **default** argument is identified by having no corresponding **result** expression, *i.e.* it must be the final argument in the function where the function contains an odd, rather than an even, number of arguments. If no **default** argument is supplied and no match is found this function returns the **#N/A!** error.

To illustrate, consider the following painful formula:

=SWITCH(MID(\$G13,SEARCH("-", \$G13)+1,SEARCH("-", \$G13,(SEARCH("-", \$G13)+1))-SEARCH("-", \$G13)-1),"XS","Extra Small","S","Small","M","Medium","L","Large","XL","Extra Large","Not Specified")

H13	:	X	✓	f _x	=SWITCH(MID(\$G13,SEARCH("-", \$G13)+1,SEARCH("-", \$G13,(SEARCH("-", \$G13)+1))-SEARCH("-", \$G13)-1), "XS","Extra Small","S","Small","M","Medium","L","Large","XL","Extra Large","Not Specified")
-----	---	---	---	----------------	---

	C	D	E	F	G	H	I	J	K	L	M	N	O
--	---	---	---	---	---	---	---	---	---	---	---	---	---

Illustration

Item Code	Size	Alternative
38370-XL-Yellow	Extra Large	Extra Large
62141-L-Red	Large	Large
88756-XL-Blue	Extra Large	Extra Large
25110-XS-Black	Extra Small	Extra Small
63333-S-Blue	Small	Small
64794-XL-Blue	Extra Large	Extra Large
87168-XS-Green	Extra Small	Extra Small
60786-XL-Yellow	Extra Large	Extra Large
97198-L-Red	Large	Large
16592-L-White	Large	Large
31352-M-Yellow	Medium	Medium
30466-2XL-White	Not Specified	Not Specified
51887-XS-Black	Extra Small	Extra Small
55233-XL-Yellow	Extra Large	Extra Large
79163-S-Blue	Small	Small
33154-XL-Green	Extra Large	Extra Large
73618-XS-Black	Extra Small	Extra Small
46011-M-Red	Medium	Medium
35653-XL-Black	Extra Large	Extra Large
32210-S-Blue	Small	Small
24501-L-Red	Large	Large
41877-XL-Yellow	Extra Large	Extra Large
25117-XS-Green	Extra Small	Extra Small
79749-XL-Red	Extra Large	Extra Large
93833-L-Green	Large	Large
24112-S-Blue	Small	Small
21479-M-White	Medium	Medium
98718-XL-Yellow	Extra Large	Extra Large
28012-L-White	Large	Large

The **expression** here is

MID(\$G13,SEARCH("-", \$G13)+1,SEARCH("-", \$G13,(SEARCH("-", \$G13)+1))-SEARCH("-", \$G13)-1)

which is determining what is contained between the two hyphens (for more on text string functions, please see www.sumproduct.com/thought/text-messages.html). It is horrible, and that's the point. The formula then considers what the values may be ("XL","M") and what value should be returned as a consequence ("Extra Large", "Medium").

The corresponding Excel formula before **SWITCH** would have been a nightmare:

```
=IF(MID($G13,SEARCH("-", $G13)+1,SEARCH("-", $G13,(SEARCH("-", $G13)+1))-SEARCH("-", $G13)-1)="XS", "Extra Small",  
IF(MID($G13,SEARCH("-", $G13)+1,SEARCH("-", $G13,(SEARCH("-", $G13)+1))-SEARCH("-", $G13)-1)="S", "Small",  
IF(MID($G13,SEARCH("-", $G13)+1,SEARCH("-", $G13,(SEARCH("-", $G13)+1))-SEARCH("-", $G13)-1)="M", "Medium",  
IF(MID($G13,SEARCH("-", $G13)+1,SEARCH("-", $G13,(SEARCH("-", $G13)+1))-SEARCH("-", $G13)-1)="L", "Large",  
IF(MID($G13,SEARCH("-", $G13)+1,SEARCH("-", $G13,(SEARCH("-", $G13)+1))-SEARCH("-", $G13)-1)="XL", "Extra Large", "Not Specified"))))
```

Better Support for PivotTable Charts

Users are now able to change their fields and filters in a PivotTable, and the chart created will automatically adjust to show the changes.

Slice and Dice Table Data

Sometimes we forget just what you haven't been able to do on a Mac. At long last, you can now use Slicers for Tables to filter your data and see what filters have been applied.

Improved Visual Basic Editor (Shipped in Oct 2017 Update)

Actually, this was shipped back in the October 2017 update (and described in our newsletter back then), but as a reminder, Mac users may now create and edit macros in the Visual Basic Editor using IntelliSense, VBA menus / toolbars, debug tools, an object browser and more.

Faster Calculation Speeds

By taking advantage of multiple processing threads, Excel recalculates formulae much faster now when values are changed. This particular feature request on UserVoice ("Will Excel for Mac 2016 utilize multiple cores on Mac?") was one of the top requests with over 1,730 votes and c.700 comments.

Microsoft believes that with 64-bit version of Mac Office (released in September 2016) and with the multithreaded processing enabled, Excel for Mac 2016 version 16 is the fastest ever.

Selection Precision

Just as you can on the latest PC updates, you can now deselect extraneous cells without having to start over.

	A	B	C	D	E	F	G	H
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								

Overall, with the shared cross-platform code, Microsoft is now able to develop and roll out new Office features more quickly and closer to simultaneously across various platforms. The precision selecting is one such feature which shipped in Windows and Mac version simultaneously.

Hopefully, soon all we will be detailing is new Excel functions and features – without having to discuss which platform they pertain to!

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. Previously, we have talked about the importance of creating a **Calendar Table**. This month, we show you how to build one using **M** and a little bit of initiative.

Building a calendar using Power Query is a collaboration between Excel and Power Query. In my example, I will implement four steps:

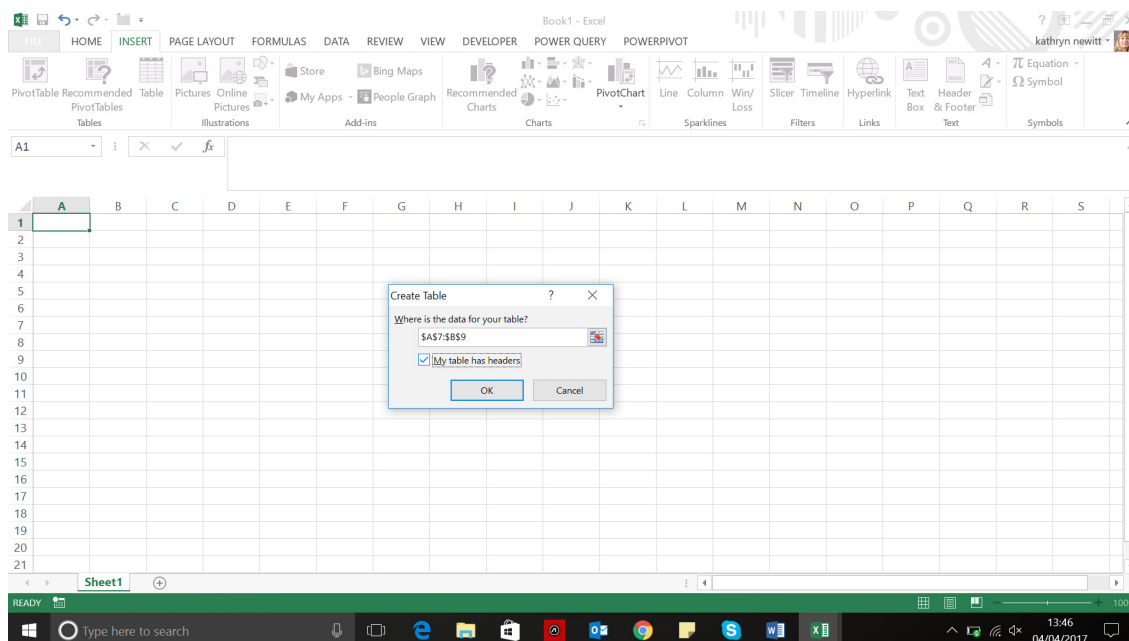
1. Create a table called **Parameters** in an Excel Worksheet to hold the calendar boundaries
2. Create a function **fnGetParameter** which uses the calendar boundaries as its parameters (we take no credit for this – it is the creation of Ken Puls, author of 'M is for (DATA) Monkey')
3. Build the basic dynamic calendar framework
4. Add any required calendar columns.

Let's go through the steps.

1. Creating Parameters

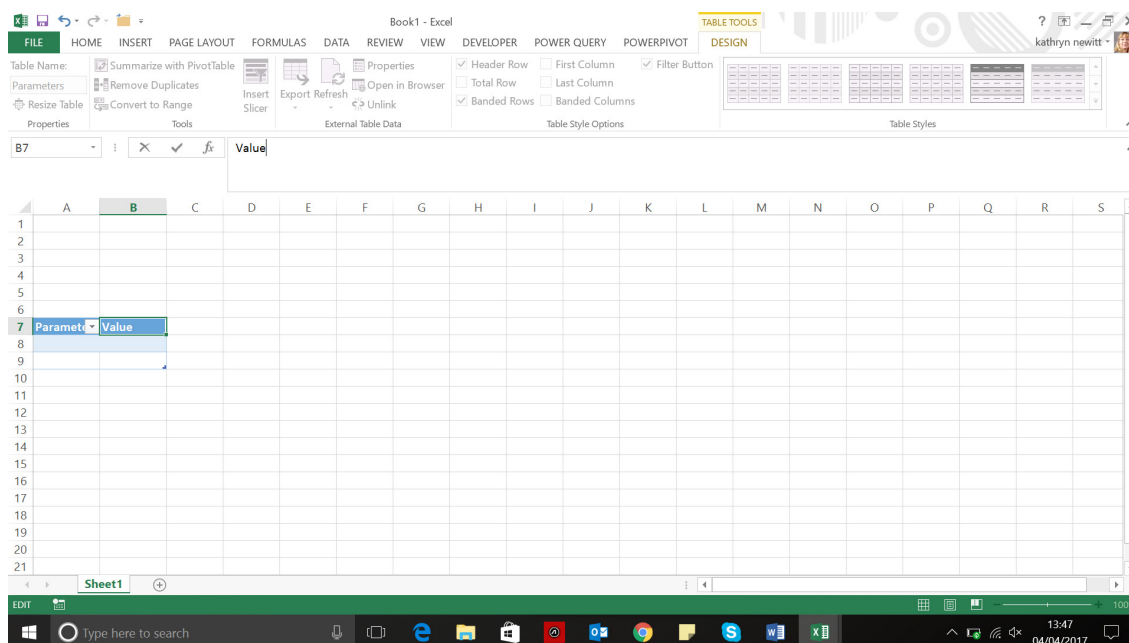
In a new blank Excel Worksheet, let's create a new table with some specific properties. Our table is to be called **Parameters** and has two columns, **Parameter** and **Value**.

To begin, open a new blank Excel worksheet – in the 'Insert' Section, there is an option to 'Insert Table' which brings up a 'Create Table' dialogue box. We'll choose an area that covers two columns and three rows (for our example, we've used **A7:B9**). Then, check the box 'My Table has Headers' and click 'OK'.



Just as an aside, normally here at SumProduct, we will advocate always starting Tables in cell **A1** and calling the worksheet the same name as the Table. We are not going to do that here to show it is not necessary, but there is merit in doing this if data is exported to other programs too. It's best to give data exporting a "helping hand" on occasion.

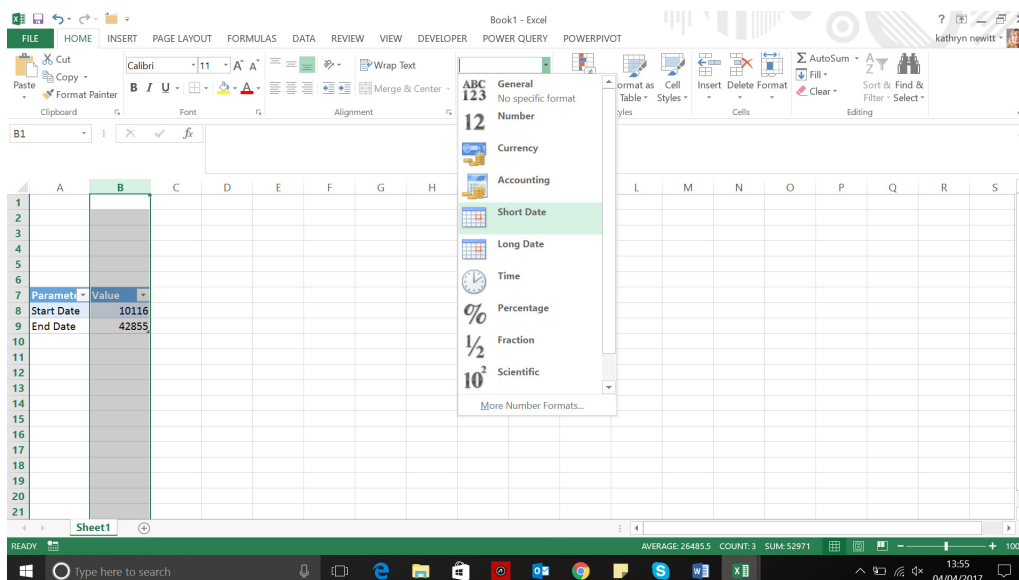
Returning to our example, the 'Table Name' can be changed in the top left of the screen and must be set to **Parameters**. Clicking on the column names allows you to set them to **Parameter** and **Value** as shown below.



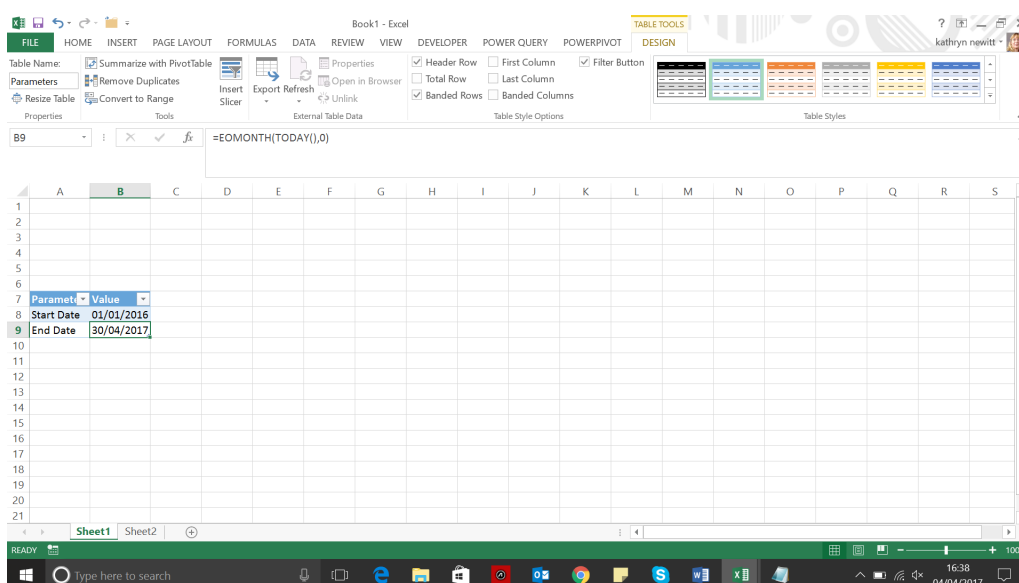
The parameters the function will be using are **Start Date** and **End Date**, and these are the entries in my first column. In the second column, enter the date you wish my calendar to begin at, and a formula that will show the last day of the current month.

Parameter	Value
Start Date	1/1/2016
End Date	=EOMONTH(TODAY(),0)

This may look like a long number to begin with – the data format on the column needs to be set to **Short Date** as shown below:

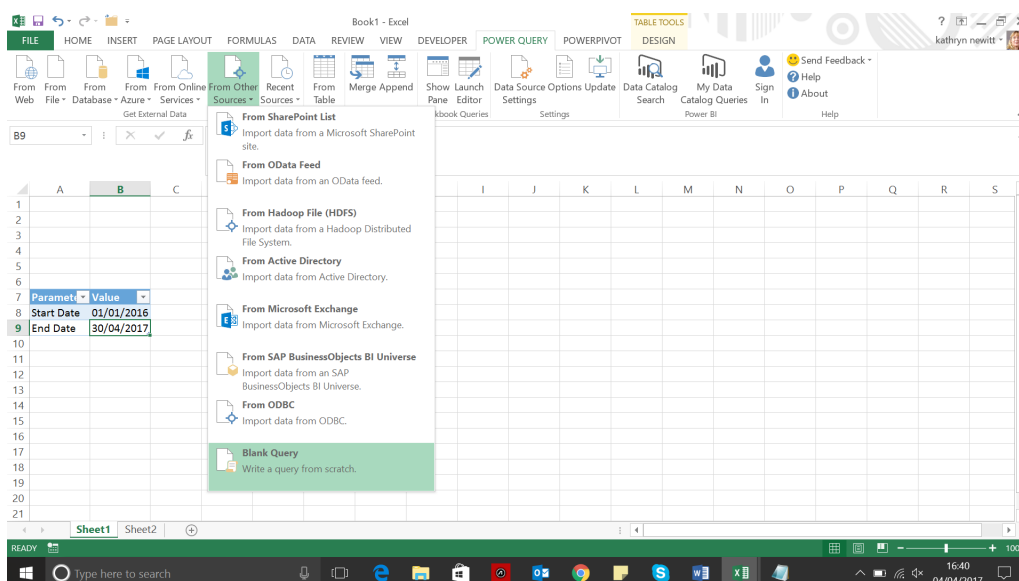


The Parameter table is now ready for the **fnGetParameter** function:



2. Create the **fnGetParameter** function

In the Power Query menus, create a new blank query by going to the 'From Other Sources' section and choosing 'Blank Query' from the dropdown:



In the 'Query Editor' screen, choose the 'Advanced Editor' from the 'Home' tab and enter the following **M** code:

(ParameterName as text) =>

let

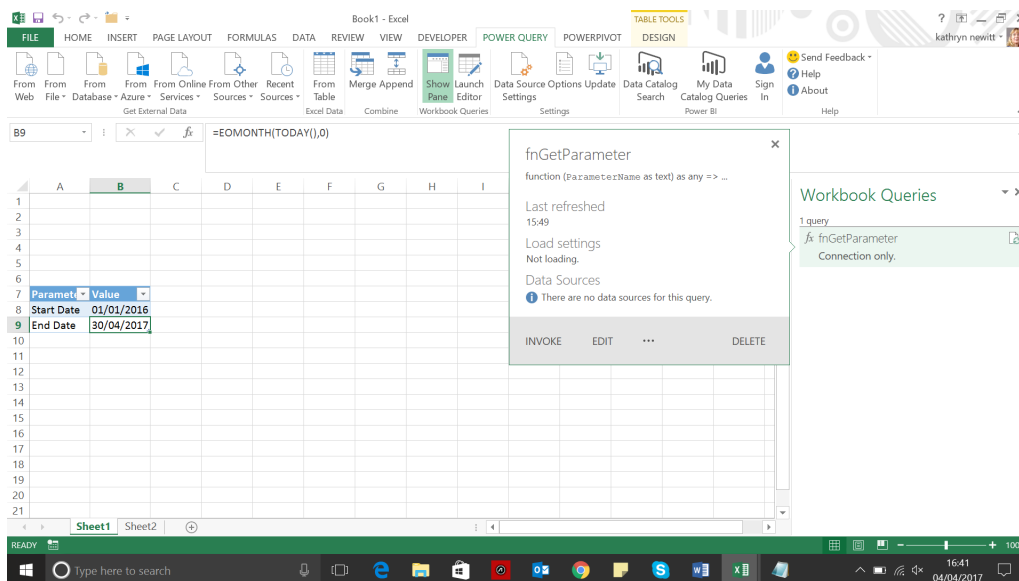
```
ParamSource = Excel.CurrentWorkbook(){[Name="Parameters"]}[Content],
ParamRow = Table.SelectRows(ParamSource, each ([Parameter]=ParameterName)),
Value=
if Table.IsEmpty(ParamRow)=true
then null
else Record.Field(ParamRow{0},"Value")
```

in

Value

Then rename the query **fnGetParameter**.

When you choose to 'Close and Load' from the 'Home' tab, the new query automatically saves as 'connection only' in the workbook pane:



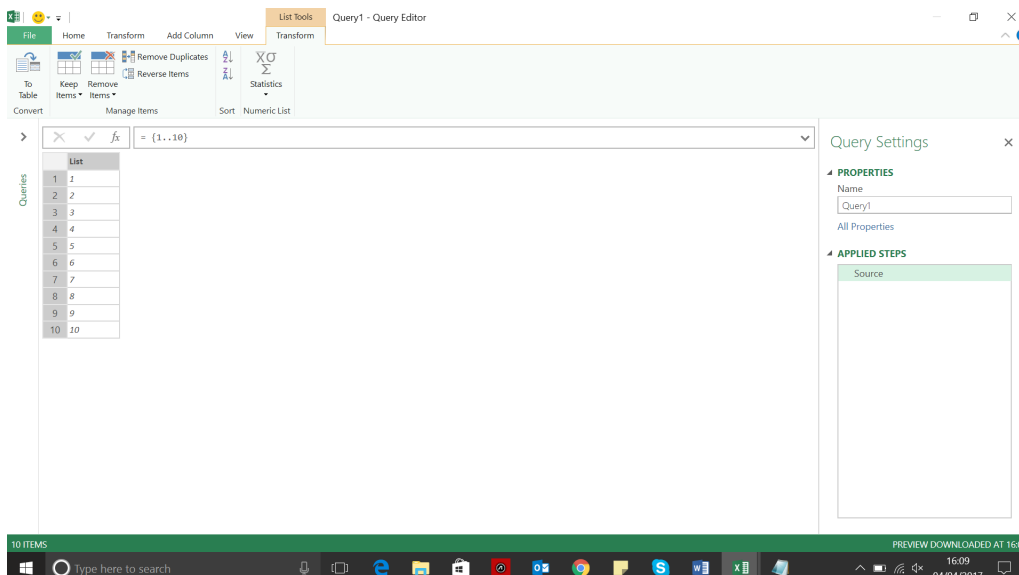
Now we have our parameters and a function which will read them. Next, we need to create a calendar framework and add columns to create a useful calendar.

3. Build Calendar Framework

In the worksheet used previously, let's start by creating another blank query, following the same procedure as before, and this time we will call it **Calendar**: The aim is to generate a calendar framework to build a list of dates between the two parameters that I have specified.

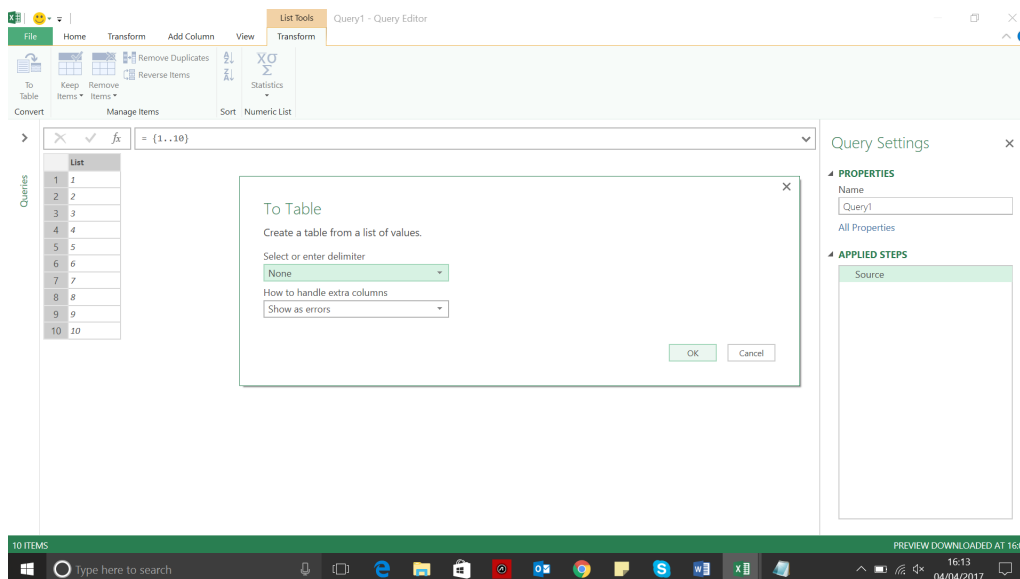
I begin by entering a simple list in the formula bar:

= {1..10}

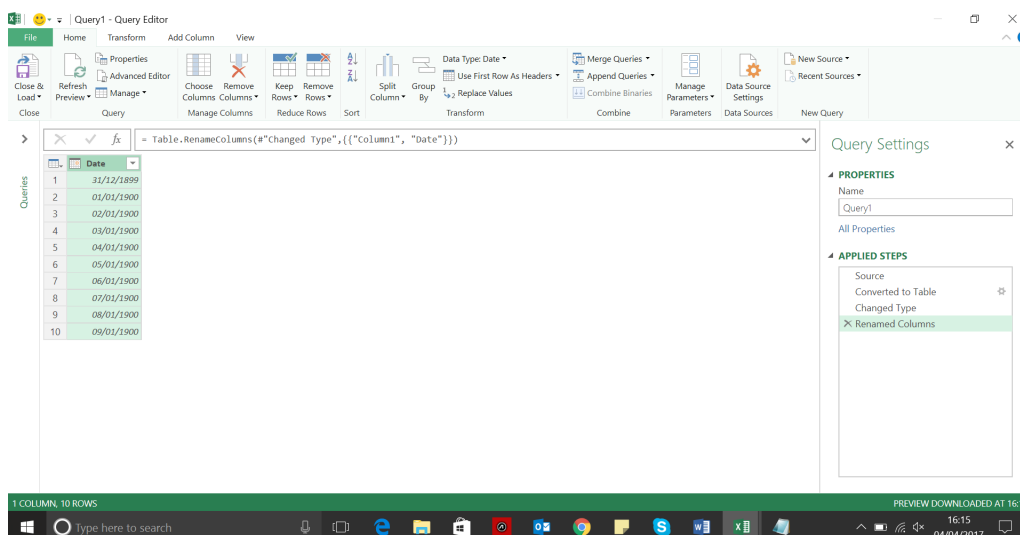


As shown above, this gives a column of 10 numbers, which I can prepare for calendar format by transforming. Notice that Power Query automatically presents me with options for transforming a list, which is what this is.

In the 'Convert' section I choose to convert my list 'to Table', and take the default options:



In the resulting table I right click my column and 'Change Type' to 'Date', and then rename my column **Date**.



They may not be current, but they are dates! Now I need my parameters. Note that Day 1 is 31 December 1899, not 1 January 1900 as it is in Excel. This is because Power Query disregards 29 February 1900 (unlike Excel) as, believe it or not, 1900 was not a leap year. This "phantom date" was created in Excel to be consistent with Lotus 1-2-3 "back in the day". By changing the start date, all dates after this "phantom date" will coincide as the same serial numbers in both Excel and Power Query.

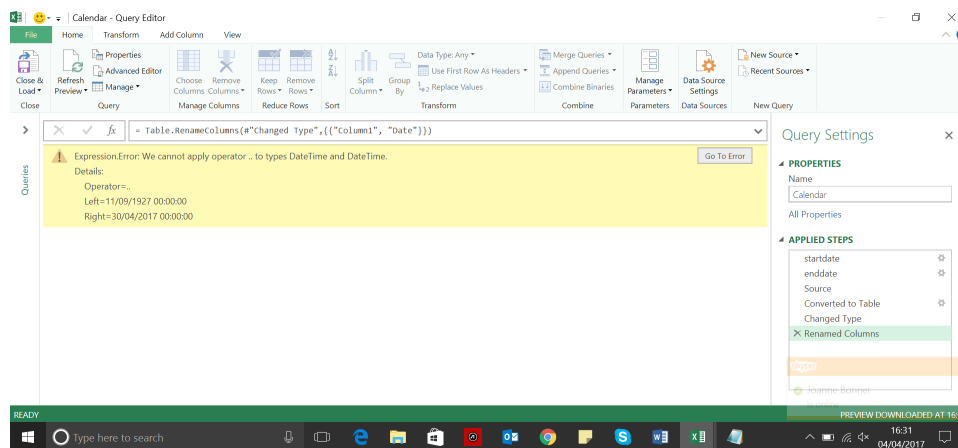
Anyway, returning to the task in hand...

Choose the 'Advanced Editor' from the 'Home' section. The editor shows the lines already created as a result of the transforming I have done. The 'Source' step currently shows my original list of 10 numbers: I need to change the source to look at my parameters instead of 1 and 10. Therefore, after 'let' and before the 'Source' line, we need to add our parameters, which we will call **startdate** and **enddate** thus:

startdate = fnGetParameter("Start Date"),
enddate = fnGetParameter("End Date"),



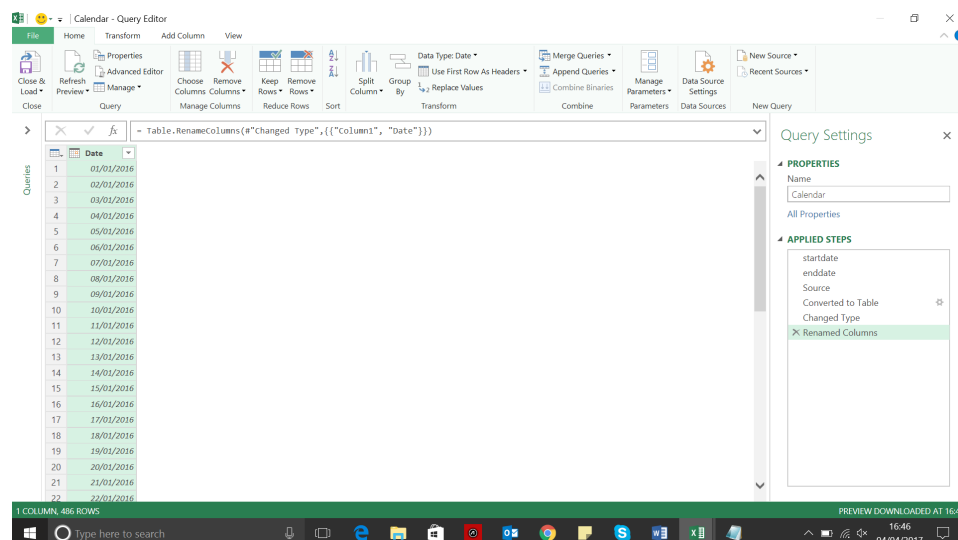
However, if you try this you will get the following error:



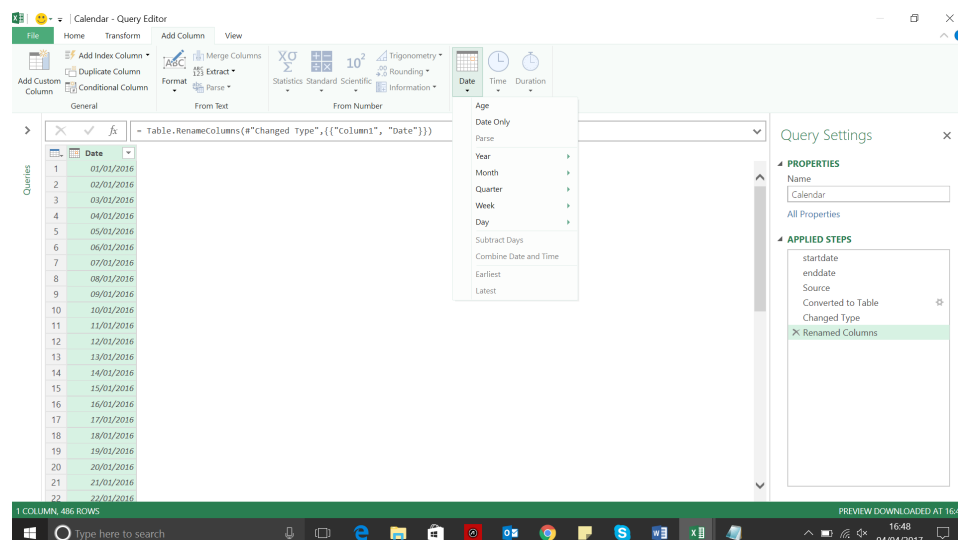
This is because we started with a list of numbers and then tried to use dates instead. We need to express the dates as numbers, so we need to use the **Number.From** function, viz.

```
startdate = Number.From(fnGetParameter(\"Start Date\")),  
enddate = Number.From(fnGetParameter(\"End Date\")),
```

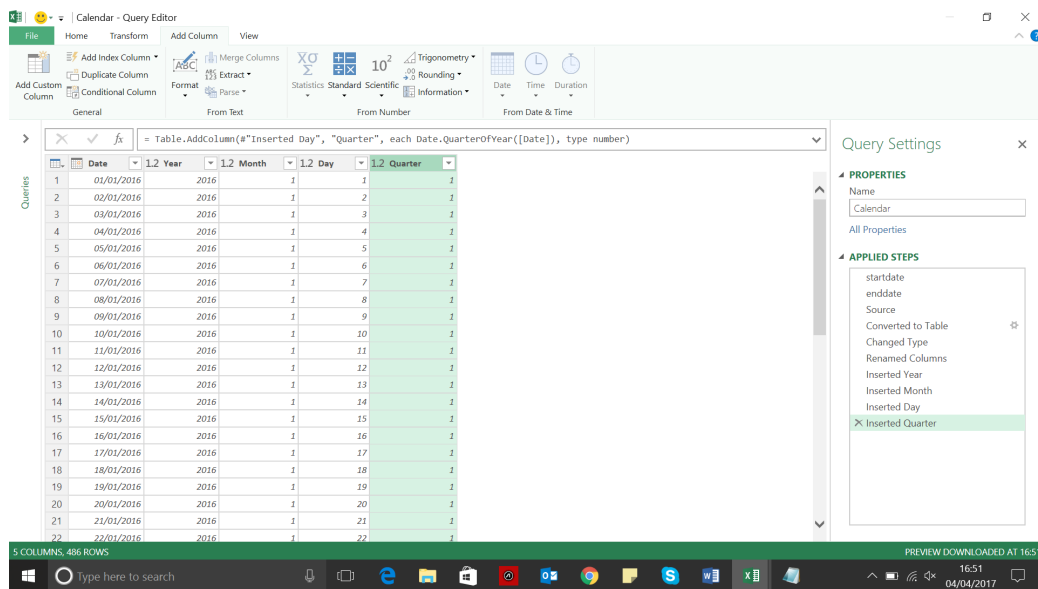
When we use these definitions instead, our query returns a column of dates:



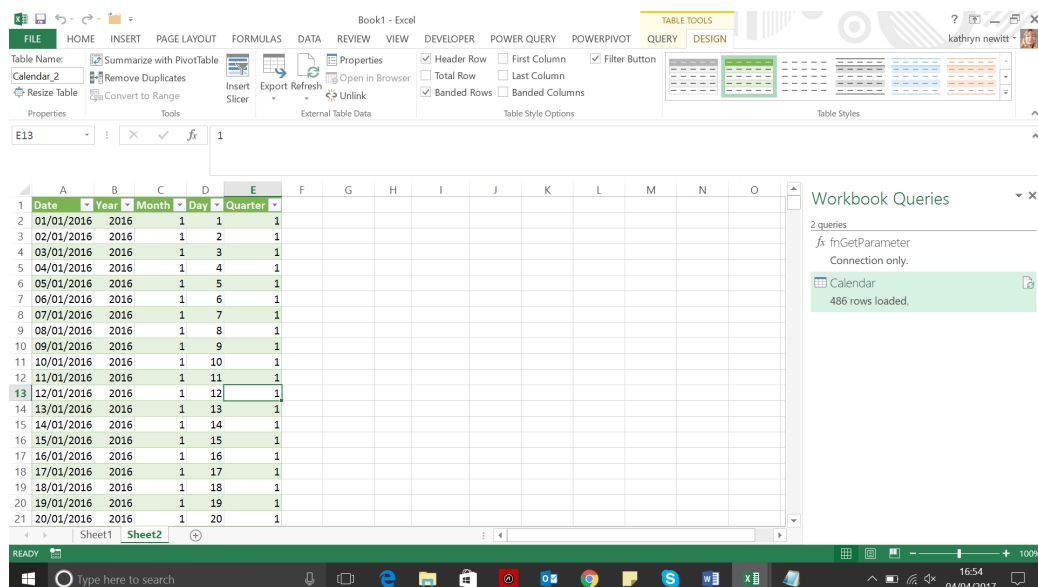
4. Adding More Date Columns



In this example, we've chosen to add the 'Year', 'Month', 'Day' and 'Quarter (of Year)' options.



On the 'Home' tab, then choose to 'Close and Load' to see that all the Calendar entries have been created as expected. The entries automatically appear in a separate sheet to our **Parameters** table:



The calendar is ready for use. More next month!

April Updates for Power BI Desktop

It seems to come around so quickly, doesn't it? Microsoft has just released its latest Power BI Desktop updates into the wild. This time out, on top of the usual visual and data connector improvements, there's key features allowing users to interact with reports in new ways. The Q&A Explorer enables report consumers to ask their own questions about the data, and buttons let you add interactive elements on your reports.

The full list for April is as follows:

Reporting

- Q&A Explorer (Preview)
- Buttons to trigger actions
- Combo chart line styles
- Improved default sort for visuals
- Numeric Slicer now Generally Available

Analytics

- Update your linguistic schema
- New DAX function: **COMBINEVALUES()**

Custom visuals

- Organisational visuals now Generally Available
- Overview by CloudScope
- Icon Map by Altius
- Hexbin Scatterplot

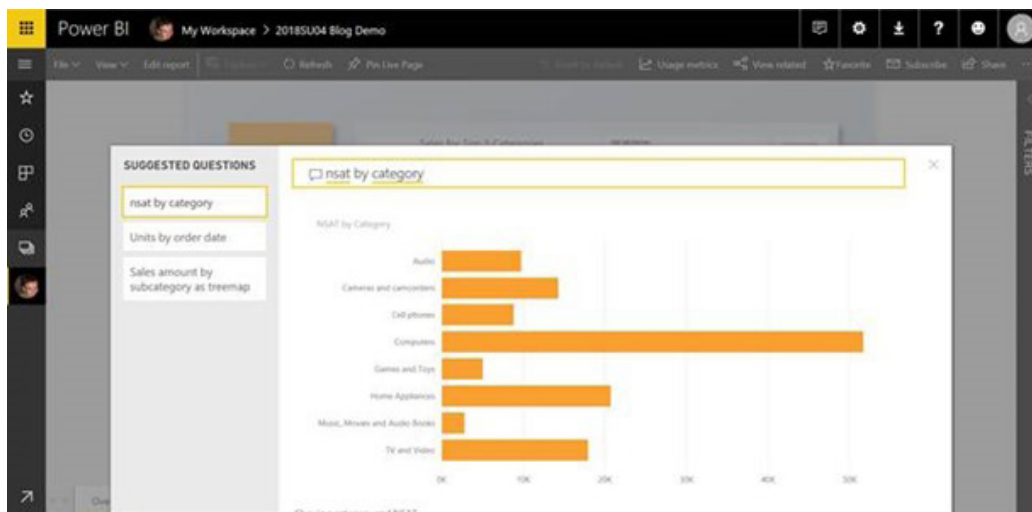
Data connectivity

- Adobe Analytics connector now Generally Available
- SAP HANA connector improvement: port selection
- Dynamics 365 Business Central connector.

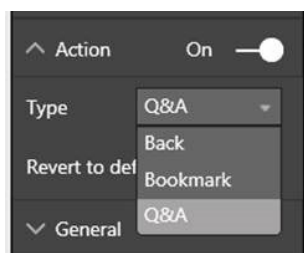
Let's take a look at each of these in turn.

Q&A Explorer (Preview)

This update provides a way to integrate a Q&A experience into your report for your users. If you want to let them ask questions about the data in your report, you may set up an image, shape or button (see next feature) to launch the new Q&A Explorer, now in Preview mode.

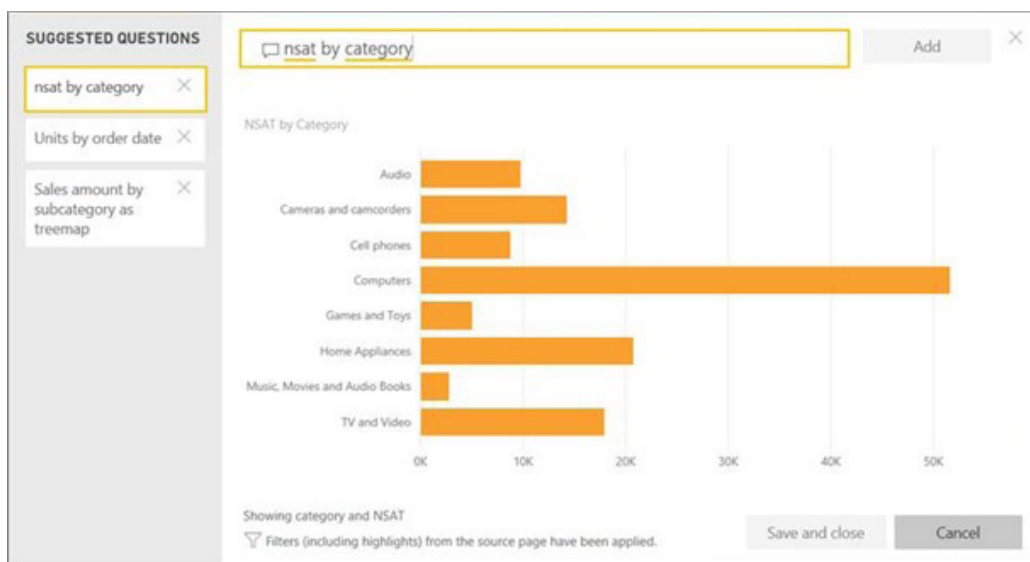


You can assign this dialog to an image, shape or button by picking 'Q&A' in the 'Type' dropdown of the 'Action' card (formerly the 'Link' card), which is where you also can also assign bookmarks or the 'Back' action too.



Once the Q&A action is set, while in edit mode, you can **CTRL + CLICK** the button to launch the dialog and try out the experience.

While you are in edit mode, you may also add suggested questions. Any suggested questions you add will be available in the dialog for consumers to view. To add suggested questions, just type in the question you have and click the 'add' button. This will add the question to the left suggested questions pane. If you decide later you want to remove a question, just click the "X" next to the question you want to remove.



Once done, select 'Save and close' to save all the suggested questions you added. These questions are saved to that specific button, so you can add multiple Q&A Explorer experiences throughout your report with different suggested questions.

Now, whenever someone is viewing your report, they can click on the button to view the suggested questions you saved and ask any *ad hoc* questions they have as well.



This Q&A Explorer can also return whole report pages back as answers. To do this, you will need to turn Q&A on for the page and give it some synonyms.

Page Information

Name: Germany

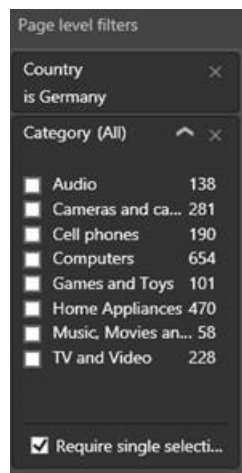
Q&A: On

Germany Sales Data, Germany sales, Germany information

Now, when someone search for those phrases in the Q&A Explorer, the page will be shown.



Optionally, if your report has page level filters, you may want to set 'Require single selection'.



If you do this, you can use that filter in Q&A to filter the page. Since drillthrough filters automatically require single selection, they are automatically parameters for Q&A pages. When you create filter parameters like this, you will have to supply a value for the filter for the page to appear in Q&A.



The Q&A Explorer will also carry filters from the source page through into the dialog. When this happens, you will see a notification at the bottom of the dialog. For example, in the below image we've cross-highlighted by Computers right before opening the dialog, so that **Category=Computer** filter is being applied to the answer we're getting back from Q&A.



This is a Preview feature, so if you assign the Q&A action to a button without turning on the 'Q&A Preview feature' under the 'Options' dialog, the Q&A Explorer will not open in Power BI Desktop.

The Q&A Explorer does not appear for Publish to Web reports or in Mobile reports (for the time being at least). However, it will work in Power BI Embedded reports.

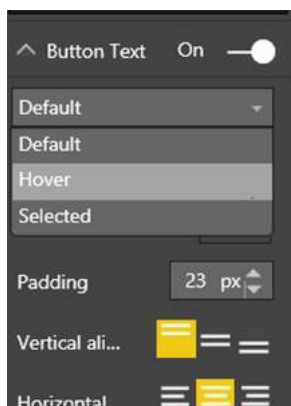
Buttons to trigger actions

Now that there are several different actions that can be triggered by just a click on a shape or image, Microsoft has decided it's time to add a button control to Power BI as well. These new buttons are geared towards letting you create an app-like experience with interactive elements in your report.

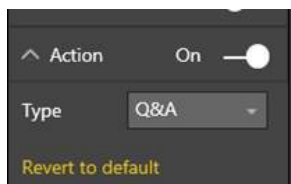


A button can be inserted from the Ribbon, by picking on of several icons or selecting a blank button. Once on your page, you can choose to add text, change the icon, add a fill color or give your button an outline. You have lots of control around the look of the icon and text including size,

colour and alignment. Once you pick your default look for your button, you can then use the dropdown to change how it looks on hover or when it is being clicked on.



As with images and shapes, you can pick the action that will be performed on click through the 'Action' card. Currently these actions include 'Back', a specific bookmark, and 'Q&A'. For certain icon types, Microsoft will have a default action assigned. For example, if you select the 'Q&A' button, the 'Action' card will default to 'Q&A':



Combo chart line styles

Back in August, line styles and legend options were added for line charts, but at the time you could not use these new styles for combo charts. This update closes that gap and you may now change your combo chart lines to different styles and have that optionally reflected in your legend.



Improved default sort for visuals

One of the goals with this update was to make it fast and easy for users to create well-formatted reports. Last month, improvements were added to the default visual placement and this update sees another improvement geared towards ease of use. Microsoft has improved the default visual sort, so you won't need to change it nearly as frequently.

The new logic for sorting visuals is as follows:

1. If your visual uses a column that has an associated order-by column, it will be sorted by that by default (you may set this up using the 'Sort by column' feature)
2. Otherwise, if your field is a date field, it will sort in chronological order
3. Lastly, if you don't have an order-by column or date field, Power BI Desktop will sort by the measure descending.

Of course, as always, Power BI will always respect any sort order you select manually.

Numeric Slicer now Generally Available

The numeric range is now Generally Available (GA) to use. You'll see it a slicer type option for numeric columns without needing to turn on a Preview feature. Additionally, any newly created slicers using numeric columns will default to the 'between' mode of the numeric range slicer.

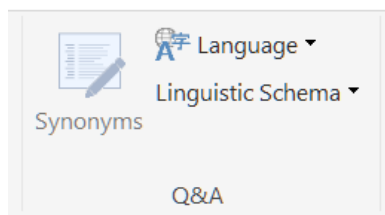


Update your linguistic schema

Now that Q&A has been integrated into both the report authoring and consuming experience, this update also considers improving the results you get back when you ask questions. To help with this, Microsoft has added the capability to export your linguistic schema in YAML format. You can then make edits to the schema such as adding phrasing and synonyms and otherwise customise the language model that Q&A uses

to understand questions about your data. You can then import your modified schema back into Power BI Desktop.

This capability is available under the 'Linguistic Schema' button on the 'Q&A' group at the end of the 'Modeling' Ribbon tab:



New DAX function: COMBINEVALUES()

This month's update also sees a new DAX function **COMBINEVALUES()**, that allows multi-part keys to be handled in a more efficient way when using DirectQuery.

Power BI doesn't directly support relationships that use multi-part keys. For example, consider the relationship between **Shipment**, and **OrderLine** in a mock table. If an **OrderLine** is uniquely identified by a combination of **OrderID** and **LineID**, then the relationship from **Shipment** to **OrderLine** would need to use those pair of columns. The common workaround is to create a calculated column on each table, that combines the values with some separator. For example:

Key = CONCATENATE(CONCATENATE([OrderID],":"),[LineID])

Then the relationship can be defined as normal. The problem with this workaround is when your using DirectQuery since now cases which require a join between the two tables will send a SQL query that joins on an expression. This often results in indices no longer being used and therefore produces a less efficient query.

The new **COMBINEVALUES** function takes as arguments a separator (*e.g.* ":") and one or more expressions. It will concatenate the values of all the expressions, with the given separator. For example, in the case above, the calculated column can now be defined using the expression:

Key = COMBINEVALUES(":",[OrderID],[LineID])

This is still simply a DAX expression, and the calculated columns are still used in the relationship as before. The difference is that this is then optimised, such that upon joining using this relationship, the condition defined in the SQL query decomposes back to use the underlying columns **[OrderID]** and **[LineID]** directly. This generally results a much more efficient SQL query.

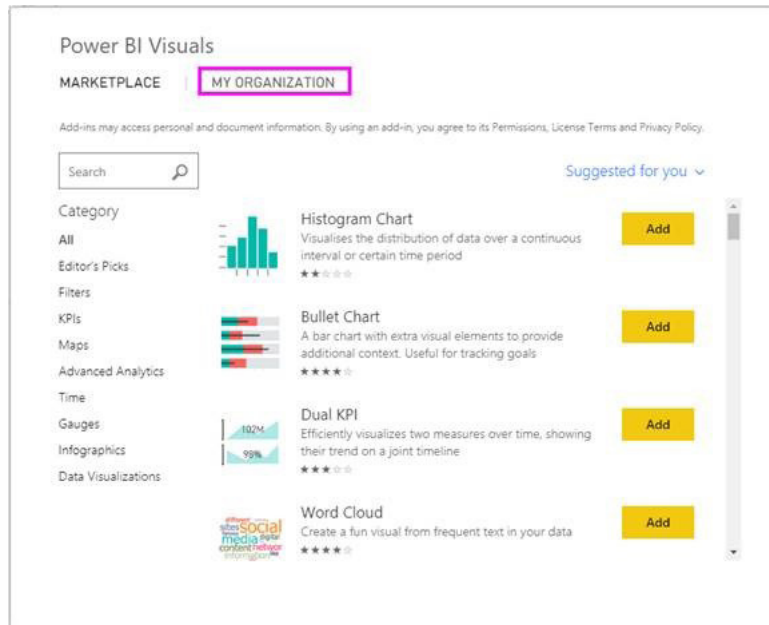
As another use case for this new DAX function, you might also want to use this function to join a set of values with a common delimiter without having a set of nested **CONCATENATE()** functions.

Organisational visuals now Generally Available

In February Microsoft released the Organizational visuals, a simple way to deploy and manage custom visuals inside organisations, in Preview. These visuals are now Generally Available (GA). This means it is available out-of-the box for both Power BI Desktop and the Power BI service.

Organisational visuals now Generally Available

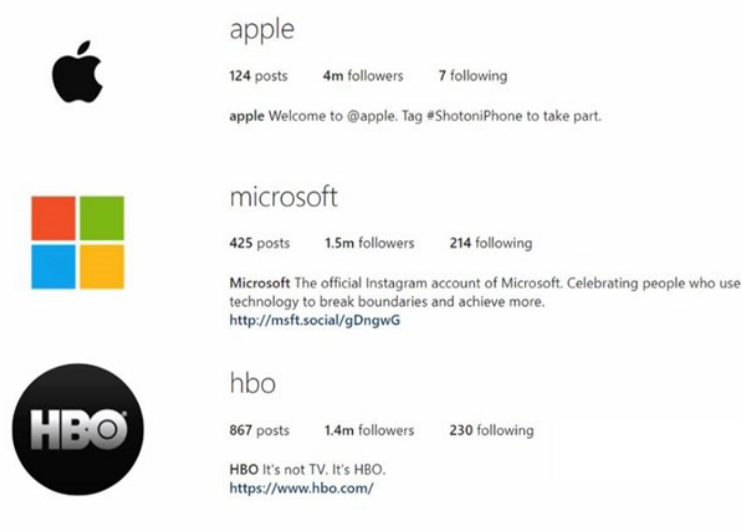
In February Microsoft released the Organizational visuals, a simple way to deploy and manage custom visuals inside organisations, in Preview. These visuals are now Generally Available (GA). This means it is available out-of-the box for both Power BI Desktop and the Power BI service.



You should note that your Power BI administrator must add custom visuals to the organisational repository before you will be able to see any visuals in this experience. Further, with this GA, Microsoft has added support for organisation visuals to be supported in Publish to Web, as well as support for the administrator to update the visual package and disable visuals.

Overview by CloudScope

The Overview by CloudScope custom visual is a presentation visual for list-oriented data, with the data appearing in a format similar to Instagram:



The control can display any of the following:

- image or icon
- screen name or headline
- account name
- account description
- clickable hyperlink
- multiple data fields.

You can use this visual to cross-highlight other visuals on your report as well.

Icon Map by Altius

The Icon Map by Altius visual allows you to show data bound images, lines and circles on a map:

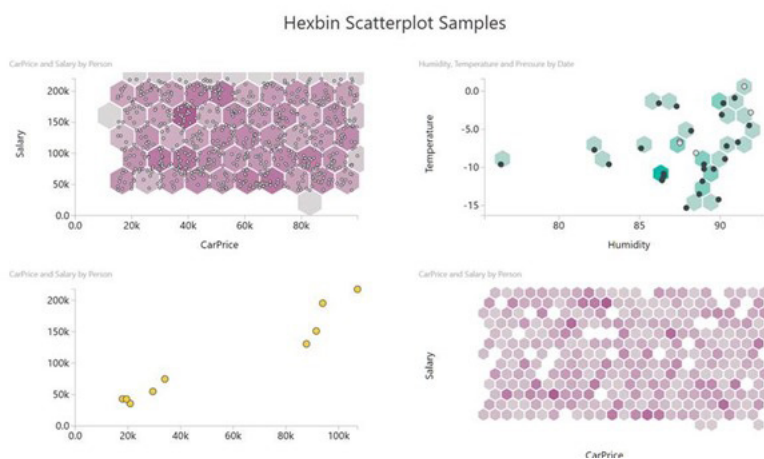


Some features of this map include:

- formatting control over the size of circles on the map
- show images in place of circles
- connect circles or images with lines
- select from different tile layers, include MapBox and Thunderforest if you have the appropriate API key
- add real-time weather layers with an OpenWeatherMap API key
- show the real-time daylight curve.

Hexbin Scatterplot

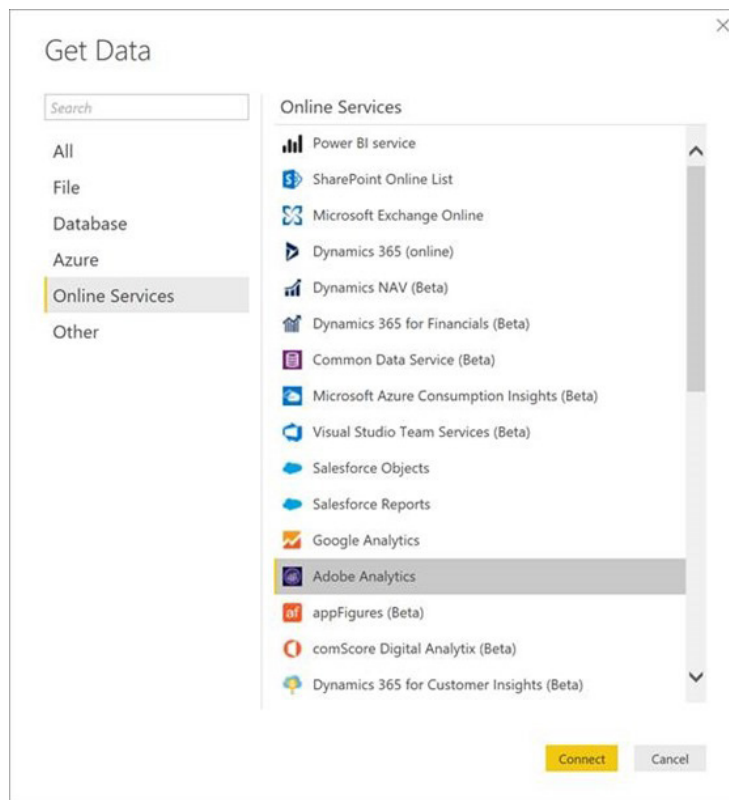
The Hexbin Scatterplot custom visual by David Eldersveld displays points on top of hexagonal "bins". Each hexbin's color is based on the density of points within each bin, with darker bins showing more points. You may control whether just the points, just the bins or both show up in addition to having formatting control over both.



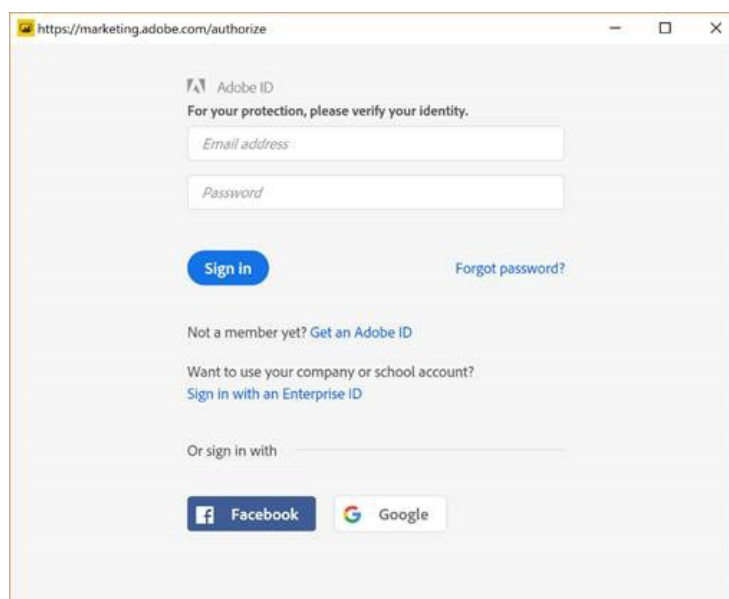
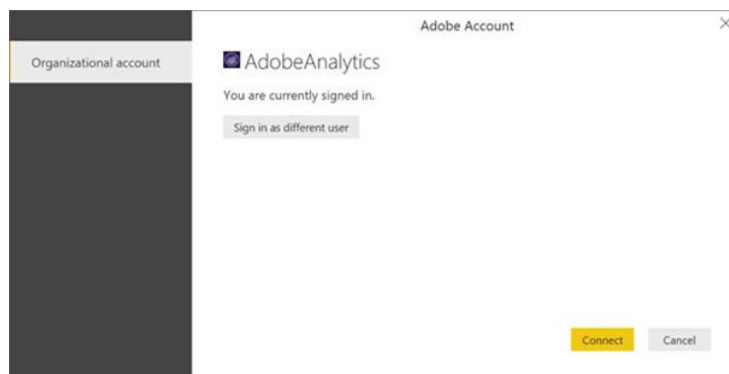
Adobe Analytics connector now Generally Available

This month sees the General Availability of the Adobe Analytics connector, which has been developed in partnership with Adobe. The connector has been available as a Preview connector since the December 2017 release of Power BI Desktop.

The Adobe Analytics connector can be found in the “Get Data” dialog under the Online Services category:

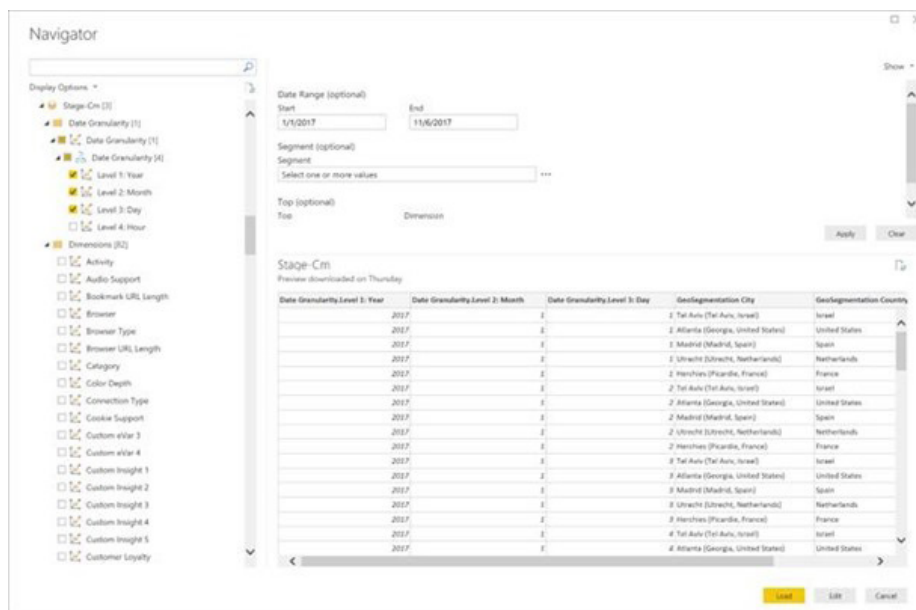


After selecting the Adobe Analytics connector, you may authenticate using your Adobe ID account credentials (assuming you have some!).



Once the connection has been successfully established, you may preview and select multiple dimensions and measures within the 'Navigator' dialog to create a single tabular output. As part of this selection, you may also provide any necessary input parameters for the selected items.

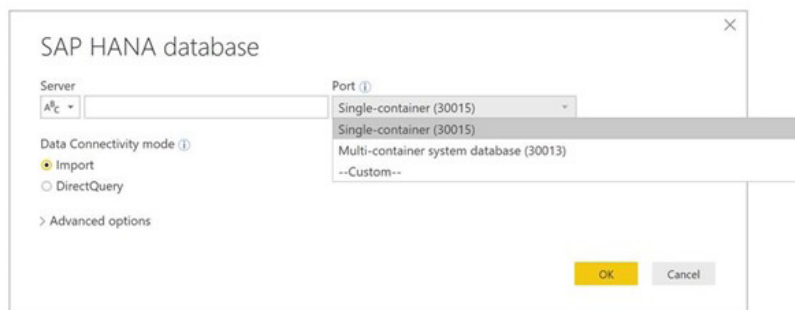
After selecting the desired information, you can decide to directly load your query into Power BI Desktop or perform any additional data transformations and filters within the Query Editor UX upfront, via the 'Edit option' in this dialog.



SAP HANA connector improvement: Port selection

An improvement to the SAP HANA connector in this release enables users to explicitly select the Port to use in order to connect to an SAP HANA server. In previous releases, Port could be specified as part of the Server input field. However, the default Port when not specified would not distinguish between single-container and multi-container SAP HANA servers.

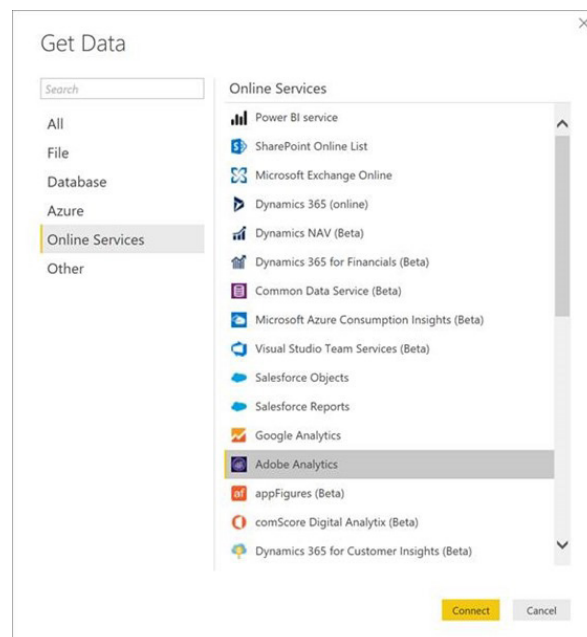
With this feature enhancement, users can now specify what type of SAP HANA server they are connecting to and get an optimised Port default for it, or alternatively select the 'Custom' option to specify a different port number.



Dynamics 365 Business Central connector

A new connector in this update allows you to connect to Dynamics 365 Business Central, previously known as Dynamics 365 for Financials. The new Dynamics 365 Business Central connector can be found under the 'Online Services' category in the 'Get Data' dialog. This connector is now also Generally Available.

More next month no doubt!



Latest Updates for Power BI Service and Mobile

It wasn't just the Desktop version of Power BI that was worked on. Microsoft has also rolled out the following new and improved features for Power Service and Mobile:

- Persistent filters in the Service and Mobile
- Organisational custom visuals Generally Available
- HITRUST CSF certification
- Mixed reality app (Preview)
- March update for On-premises data gateway
- B2B support on Mobile.

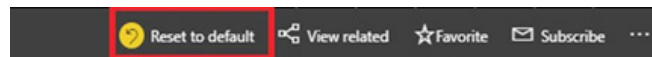
Let's take a brief look at each.

Persistent filters in the Service and Mobile

It's now easier for report consumers to pick up right where left off in the Power BI Service and Mobile. All Power BI reports will now automatically retain the filters, slicers, and other data view changes made by the user.

In the Service version, users will now see a new "Reset to default" button with a yellow icon in the top bar. This will light up whenever you make any changes to the report from the published version. The report state

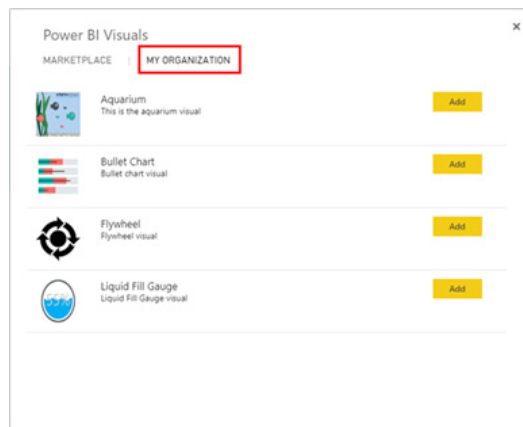
is captured after 60 seconds or immediately when you navigate away to another dashboard or report. This button may be used to revert to the published view at any time. Having said that, we do note that reports with custom visuals are not supported – yet. Microsoft states they "... are working with custom visual developers to enable these soon...". We await with bated breath.



Organisational custom visuals Generally Available

Since last month's release of the organisation visuals Preview, Microsoft has fixed many of the bugs identified and made additional improvements too. Administrators may now update the package and its details

(e.g. versions) for existing published custom visuals. Also, organisation visuals are now supported in 'Publish to Web' reports. Consequently, this feature has now become GA (Generally Available).



HITRUST CSF certification

Given that organisations have a diverse set of compliance and regulatory requirements that need to be met concerning their data security and privacy, Power BI has added to the existing 22 certifications and

attestations to provide users with further reassurance. April saw Microsoft announce that Power BI has now been certified under the HITRUST Common Security Framework (CSF) 8.1 certification criteria.

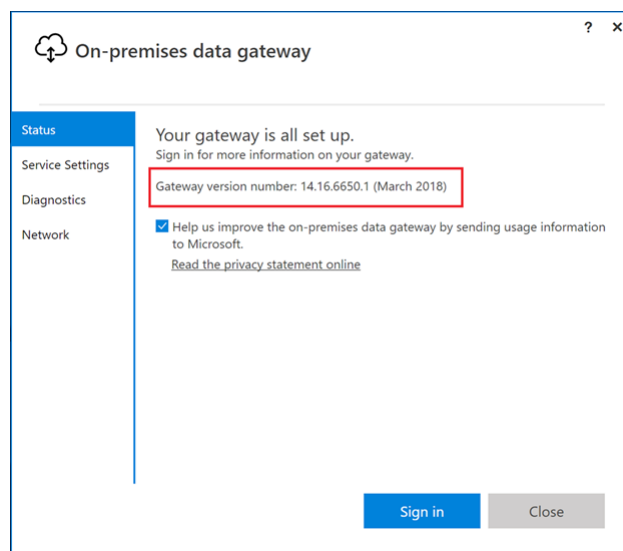
Mixed reality app (Preview)

Power BI has teamed up with Microsoft HoloLens to release a preview of the Power BI for Mixed Reality app. This app makes it easy to access your Power BI content while using HoloLens, allowing users to view and

interact with report pages and dashboards on top of your real-world environment. You can download this app from the Microsoft Store now.

March update for On-premises data gateway

There's also a new update for the Power BI On-premises data gateway. The latest update includes a new version of the mashup engine and an update to make it easier for users to determine the release month of the installed gateway right next to the version. You can learn more by installing the new gateway and having a play.



B2B support on Mobile

Power BI Mobile now supports a key B2B feature: finally, you may now share dashboards and reports with users external to the organisation, on the go. External sharing is enabled for both organisational and – at long last – social accounts.

More soon, we're sure.

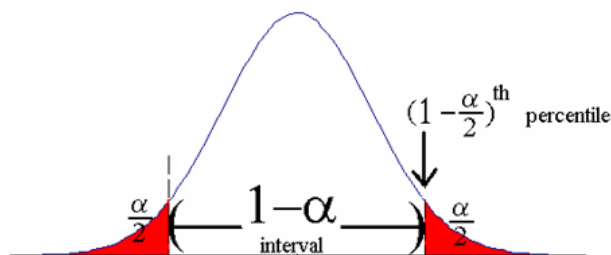
The A to Z of Excel Functions: CONFIDENCE

Do you need more **CONFIDENCE** in your Excel files? This function returns the confidence interval for a population mean, using the theory associated with the normal distribution.

To explain, the confidence interval is a range of values around a sample mean, \bar{x} , which sits at the centre of this range, i.e. the range is $\bar{x} \pm \text{CONFIDENCE}$. For example, if \bar{x} is the sample mean of delivery times for products ordered through the mail, $\bar{x} \pm \text{CONFIDENCE}$ is a range of population means.

For any population mean, μ_0 , in this range, the probability of obtaining a sample mean further from μ_0 than \bar{x} is greater than the significance

level required, **alpha**; for any population mean, μ_0 , not in this range, the probability of obtaining a sample mean further from μ_0 than \bar{x} is less than this level, alpha. In other words, assume that we use \bar{x} , a standard deviation **standard_dev**, and size to construct a two-tailed test at significance level **alpha** of the hypothesis that the population mean is μ_0 . Then we will not reject that hypothesis if μ_0 is in the confidence interval and will reject that hypothesis if μ_0 is not in the confidence interval. The confidence interval does **not** allow us to infer that there is probability **1 - alpha** that our next package will take a delivery time that is in the confidence interval.



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

CONFIDENCE(alpha, standard_dev, size)

- **alpha**: this is required. This represents the significance level used to compute the confidence level. The confidence level equals $100 \times (1 - \text{alpha})\%$, or in other words, an **alpha** of 0.05 indicates a 95 percent confidence level
- **standard_dev**: this is also required. This is the population standard deviation for the data range and is assumed to be known
- **size**: also required. This is the sample size.

It should be further noted that:

- if any argument is non-numeric, **CONFIDENCE** returns the #VALUE! error value
- if **alpha** is ≤ 0 or ≥ 1 , **CONFIDENCE** returns the #NUM! error value
- if **standard_dev** ≤ 0 , **CONFIDENCE** returns the #NUM! error value
- if **size** is not an integer, it is truncated
- if **size** < 1 , **CONFIDENCE** returns the #NUM! error value
- if we assume **alpha** equals 0.05, we need to calculate the area under the standard normal curve that equals **1 - alpha**, or 95%. This value is ± 1.96 . The confidence interval is therefore:

$$\bar{x} \pm 1.96 \left(\frac{\sigma}{\sqrt{n}} \right)$$

- this function has been superseded (see below).

Please see our example below:

	A	B	C	D
1	Data	Description		
2	0.05	Significance level		
3	2.5	Standard deviation of the population		
4	50	Sample size		
5				
6				
7	Formula	Description	Result	
8	=CONFIDENCE(A2,A3,A4)	Confidence interval for a population mean. In other words, the confidence interval for the underlying population mean for travel to work equals 30 plus or minus 0.692952 minutes, or 29.3 to 30.7 minutes.	0.692951912	
9				

The A to Z of Excel Functions: CONFIDENCE.NORM

We suppose this function is more the **NORM...** This function first appeared in Excel 2010 but is simply an updated version of the **CONFIDENCE** function, which is available in earlier versions of Excel. Again, this returns the confidence interval for a population mean, using the theory associated with the normal distribution.

The **CONFIDENCE.NORM** function employs the following syntax to operate:

CONFIDENCE.NORM(alpha, standard_dev, size)

- **alpha**: this is required. This represents the significance level used to compute the confidence level. The confidence level equals **100*(1 - alpha)%**, or in other words, an **alpha** of 0.05 indicates a 95 percent confidence level
- **standard_dev**: this is also required. This is the population standard deviation for the data range and is assumed to be known
- **size**: also required. This is the sample size.

It should be further noted that:

- if any argument is non-numeric, **CONFIDENCE.NORM** returns the **#VALUE!** error value
- if **alpha** is ≤ 0 or ≥ 1, **CONFIDENCE.NORM** returns the **#NUM!** error value
- if **standard_dev** ≤ 0, **CONFIDENCE.NORM** returns the **#NUM!** error value
- if **size** is not an integer, it is truncated
- if **size** < 1, **CONFIDENCE.NORM** returns the **#NUM!** error value
- if we assume **alpha** equals 0.05, we need to calculate the area under the standard normal curve that equals **1 - alpha**, or 95%. This value is ± 1.96. The confidence interval is therefore:

$$\bar{x} \pm 1.96 \left(\frac{\sigma}{\sqrt{n}} \right)$$

Please see the example below:

	A	B	C	D
1	Data	Description		
2	0.05	Significance level		
3	2.5	Standard deviation of the population		
4	50	Sample size		
5				
6				
7	Formula	Description	Result	
8	=CONFIDENCE(A2,A3,A4)	Confidence interval for a population mean. In other words, the confidence interval for the underlying population mean for travel to work equals 30 plus or minus 0.692952 minutes, or 29.3 to 30.7 minutes.	0.692951912	
9				

The A to Z of Excel Functions: CONFIDENCE.T

Have you got your **CONFIDENCE** down to a **T**? This function first appeared in Excel 2010 but unlike **CONFIDENCE.NORM** there was no equivalent in earlier versions of Excel. That is because this function returns the confidence interval for a population mean, using a **Student's t** distribution.

The **CONFIDENCE.T** function employs the following syntax to operate:

CONFIDENCE.T(alpha, standard_dev, size)

- **alpha**: this is required. This represents the significance level used to compute the confidence level. The confidence level equals $100 \times (1 - \text{alpha})\%$, or in other words, an **alpha** of 0.05 indicates a 95 percent confidence level
- **standard_dev**: this is also required. This is the population standard deviation for the data range and is assumed to be known
- **size**: also required. This is the sample size.

It should be further noted that:

- if any argument is non-numeric, **CONFIDENCE.T** returns the **#VALUE!** error value
- if **alpha** is ≤ 0 or ≥ 1 , **CONFIDENCE.T** returns the **#NUM!** error value
- if **standard_dev** ≤ 0 , **CONFIDENCE.T** returns the **#NUM!** error value
- if **size** is not an integer, it is truncated
- if **size** < 1 , **CONFIDENCE.T** returns the **#DIV/0!** error value

Please see our final example for this month below:

	A	B	C	D
1	Data	Description		
2	0.05	Significance level		
3	1	Standard deviation of the population		
4	50	Sample size		
5				
6				
7	Formula	Description	Result	
8	=CONFIDENCE.T(A2,A3,A4)	Confidence interval for a population mean, based on Student's t distribution.	0.284196855	
9				

Upcoming SumProduct Training Courses

Location	Course	Date	Duration
Melbourne	Financial Modelling	1 - 2 May 2018	2 days
Melbourne	Power Pivot, Power Query and Power BI	7 - 9 May 2018	3 days
Auckland	Financial Modelling	21 - 22 May 2018	2 days
Wellington	Financial Modelling	24 - 25 May 2018	2 days
Darwin	Financial Modelling	4 - 5 Jun 2018	2 days
Sydney	Power Pivot, Power Query and Power BI	18 - 20 Jun 2018	3 days
Sydney	Financial Modelling	25 - 26 Jun 2018	2 days
Melbourne	Excel Tips & Tricks	2 Jul 2018	1 day
Melbourne	Financial Modelling	3 - 4 Jul 2018	2 days
Melbourne	Power Pivot, Power Query and Power BI	17 - 19 Jul 2018	3 days
Sydney	Excel Tips & Tricks	13 Aug 2018	1 day
Sydney	Financial Modelling	15 - 16 Aug 2018	2 days

Brisbane	Excel Tips & Tricks	27 Aug 2018	1 day
Brisbane	Financial Modelling	28 - 29 Aug 2018	2 days
Sydney	Power Pivot, Power Query and Power BI	10 - 12 Sep 2018	3 days
Perth	Financial Modelling	17 - 18 Sep 2018	2 days
Perth	Power Pivot, Power Query and Power BI	19 - 21 Sep 2018	3 days

Each newsletter, we'd like to introduce you to useful keystrokes you may or may not be aware of. This month we are on the up and up as we focus on the Up Arrow key:

Keystroke	What it does
Down Arrow	Move down one cell
ALT + Down Arrow	Open drop-down (auto-complete, filter or validation)
CTRL + Down Arrow	Select the last cell in the current region
SHIFT + Down Arrow	Extend selection down one cell
CTRL + ALT + Down Arrow	Intel Chipset: Invert screen display (180 degrees orientation)
CTRL + SHIFT + Down Arrow	Extend selection down to the last cell in the region

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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We have undertaken a vast array of assignments over the years, including:

- **Business planning**
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- **Independent expert reviews**
- **Key driver analysis**
- **Model reviews / audits for internal and external purposes**
- **M&A work**
- **Model scoping**
- **Power BI, Power Query & Power Pivot**
- **Project finance**
- **Real options analysis**
- **Refinancing / restructuring**
- **Strategic modelling**
- **Valuations**
- **Working capital management**

If you require modelling assistance of any kind, please do not hesitate to contact us at contact@sumproduct.com.

Link to Others

These newsletters are not intended to be closely guarded secrets. Please feel free to forward this newsletter to anyone you think might be interested in converting to "the SumProduct way".

If you have received a forwarded newsletter and would like to receive future editions automatically, please subscribe by completing our newsletter registration process found at the foot of any www.sumproduct.com web page.

Any Questions?

If you have any tips, comments or queries for future newsletters, we'd be delighted to hear from you. Please drop us a line at newsletter@sumproduct.com.

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SumProduct offers a wide range of training courses, aimed at finance professionals and budding Excel experts. Courses include Excel Tricks & Tips, Financial Modelling 101, Introduction to Forecasting and M&A Modelling.

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