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10 conferences, 23 MVP awards, one Best of Business State Finalist Award, two National Finalist Training Awards, one Lifetime Achievement Award, one Finalist for Lifetime Achievement Award, 10 books (with two in progress), 1,735 articles, 1,103 keyboard shortcuts, 132 readers' questions and 4,642 pages and counting – that's right this newsletter hits 150!

It's a three-fold celebration this month: our newsletter turns 150, an alumnus becomes a gameshow winner and Microsoft hits 50.

And then there are the regulars.

With no Power BI Updates last month, we have twice as many this time around! There is the usual Beat the Boredom Challenge, Charts & Dashboards Tips, Over to AI, Excel for Mac, Visual Basics, Power Pivot Principles, Power Query Pointers, Excel Updates, plus we see the A to Z of Excel functions are not always **PI** in the sky! Finally, we look at some simpler Keyboard Shortcuts to wrap up.

Happy reading and remember: stay safe, stay happy, stay healthy.

Liam Bastick, Managing Director, SumProduct



Congratulations to Myles Kuah



Hard to believe, but a Channel Ten image rather than a SumProduct staff photo!

As we celebrate our own anniversary newsletter, let's keep the positives coming! Congratulations to SumProduct alumnus **Myles Kuah** who was named Sole Survivor and won season 10 of *Australian Survivor Brains v Brawn II*.

Self-proclaimed "Jungle Rat", Myles proved exceedingly tenacious and popular on the recent TV series and exuded as much enthusiasm on the show as we saw in the workplace. Those of you to catch Myles in the

flesh in one of our AI training sessions will know exactly what we are talking about!

Now with big prize winnings to boot, Myles is presently revelling in his new-found fame and success and t-shirt merchandise! We wish him all the best. You never know where he might pop up: he still narrates some of the AI training which you can check out on our website or email us about at training@sumproduct.com.



Microsoft Turns 50



...And the celebrations come in threes! In early April, Microsoft celebrated its 50th anniversary. Given how reliant we are here on MS products (and in particular, Excel and Power BI), we tip our hat to the software giant.

"Just" a mere half-century ago, childhood friends Bill Gates and Paul Allen started Microsoft from a strip mall in Albuquerque, New Mexico. \$3 trillion later, the company celebrates its 50th birthday as the second most valuable publicly traded company in the world behind Apple. In all that time, Microsoft has only had three Chief Executive Officers in its history, two of whom are amongst the 11 richest people in the world due to their Microsoft fortunes (Steve Ballmer and Bill Gates). Hope for us here at SumProduct!

We wonder what the next 50 years will bring...

Beat the Boredom Challenge

With many of us currently "working from home" / quarantined, there are only so Zoom / Teams calls and virtual parties you can make before you reach your (data) limit. Perhaps they should measure data allowance in blood pressure millimetres of mercury (mmHg). To try and keep our readers engaged, we will continue to reproduce some of our popular **Final Friday Fix** challenges from yesteryear in this and upcoming newsletters. One suggested solution may be found later in this newsletter. Here's this month's...

This month, we have a Power Query challenge for you. We have received some expense information in an Excel workbook which is not in a format that is compatible with our usual layout, *viz*.

My Expens	es for Last Week			
Date	22 Marc	ch 2023		
Petrol	Lunch	Hotel	Dir	ner
	25	15	100	50

Therefore, this month's challenge is to extract the data from a sheet in the supplied Excel workbook and present it in a Table that can be appended to other expense data. The result should look like the Table below:

Suggested Solution

Expense	Ŧ	Amount	•	Date	Ŧ
Petrol		2	25	22/03/20	23
Lunch			15	22/03/20)23
Hotel		1(00	22/03/20	23
Dinner		Į	50	22/03/20)23
Treats			10	22/03/20	23

Note: Our dates are in UK format - this is not part of the challenge (use whatever dates are "correct" in your part of the world)!

As always, there are some conditions:

- this is a Power Query challenge: no Excel formulae allowed
- the solution should allow us to add more expenses
- the solution should need less than 10 steps (one transformation per step)
- All the steps can be achieved using the User Interface (UI) from one query. No M code is needed.

Sounds easy? Try it. One solution just might be found later in this newsletter – but no reading ahead!

Over to Al



Here at SumProduct we write many articles for many magazines and our authoring contracts have been revised recently to ensure Artificial Intelligence hasn't taken over our duties. We can assure everyone they have not.

But it did get us thinking: what if we did let AI loose and write a regular article for the newsletter?

This month, we asked AI what it thought was the current flavour of the month in Excel.

This Month's Prompt: How many Excel functions do you need to know to be considered an expert financial modeller? Which functions do you need to know and why? Why does knowing these functions make you an expert financial modeller?

To be considered an expert financial modeller, it is crucial to have a comprehensive understanding of a wide range of Excel functions. These functions are the building blocks of robust financial models, enabling analysts to perform complex calculations, analyse data efficiently and present results in a clear, professional manner. While there is no

definitive number of functions one must know, mastering a core set of essential functions is imperative.

The core Excel functions for financial modelling are presented below.

1. Logical Functions

IF, AND, OR, NOT

Logical functions are fundamental in creating dynamic models that can adapt to different scenarios. The **IF** function allows you to make logical comparisons and return specific values based on whether conditions are true or false. Combining **IF** with **AND**, **OR** and **NOT** enables more complex logical tests and decision-making processes within your models.

2. Lookup and Reference Functions

VLOOKUP, HLOOKUP, INDEX, MATCH

These functions are essential for retrieving data from large datasets and different tables. **VLOOKUP** and **HLOOKUP** are commonly used for vertical and horizontal lookups, respectively. However, mastering **INDEX** and **MATCH** is crucial as they provide more flexibility and accuracy in data retrieval, especially in dynamic and multi-dimensional models.

3. Financial Functions

NPV, IRR, PMT, FV

Financial functions are indispensable for calculating key financial metrics such as net present value (NPV), internal rate of return (IRR), payment amounts (PMT) and future value (FV). These functions help in evaluating investment opportunities, measuring profitability and performing various financial analyses.

4. Statistical Functions

AVERAGE, MEDIAN, STDEV, VAR, CORREL

Statistical functions are used to summarise and analyse data distributions. Functions like **AVERAGE** and **MEDIAN** provide measures of central tendency, while **STDEV** and **VAR** measure dispersion. **CORREL** is useful for understanding the relationship between different variables, which is crucial in risk assessment and forecasting.

5. Text Functions

CONCATENATE, LEFT, RIGHT, MID, TEXT

Text functions are essential for manipulating and cleaning data. **CONCATENATE** combines text from multiple cells into one, while **LEFT**, **RIGHT** and **MID** extract specific parts of a text string. The **TEXT** function helps in formatting numbers and dates as text, ensuring that your data is presented clearly and consistently.

6. Date and Time Functions

TODAY, NOW, EOMONTH, YEARFRAC

Date and time functions are crucial for time-based calculations and projections. **TODAY** and **NOW** return the current date and time, while **EOMONTH** calculates the end of a month. **YEARFRAC** is useful for calculating the fraction of a year between two dates, which is important in discounting cash flows and other time-sensitive analyses.

7. Array Functions

SUMPRODUCT, TRANSPOSE, MMULT

Array functions are powerful tools for performing complex calculations on ranges of data. **SUMPRODUCT** multiplies corresponding elements in arrays and returns the sum of the products. **TRANSPOSE** changes the orientation of a range of cells and **MMULT** performs matrix multiplication, which is essential in advanced financial modelling techniques.

Why Knowing These Functions Make You an Expert

Mastering these Excel functions equips you with the skills to build accurate, flexible and insightful financial models. Here's why:

- Accuracy and Efficiency: these functions help ensure that your calculations are precise and that you can perform complex analyses quickly
- Flexibility: understanding how to use these functions allows you to create dynamic models that can adapt to different scenarios and inputs
- Professionalism: expert knowledge of these functions enables you to present data and results in a clear, polished, and professional manner
- Insightful Analysis: these functions provide the tools necessary to conduct deep and meaningful analyses, helping you uncover insights and make informed decisions.

By mastering these essential Excel functions, you will be well-equipped to tackle any financial modelling challenge with confidence and expertise.

Do you agree AI will get there this year? Good to see **VLOOKUP** here again and deprecated functions like **CONCATENATE** and **VAR**! And is **SUMPRODUCT** actually required with dynamic array formulae anymore..?

I don't use some of these functions so clearly, I'm no expert... It will be interesting to see precisely what happens. Send us your comments and ideas for questions to contact@sumproduct.com.

Excel for Mac

Each month, we'll cover a different topic to help you understand how Excel for Mac is different than Excel for Windows. This month, in our series about Microsoft Excel for Mac, we show you some small differences in the way that filters work, why it's that way and why it might be important to you.

The Filter dialog is a fundamental part of Excel and it's used in numerous places – on ranges, tables / Tables and PivotTables. Knowing how to filter your data is key, so keep reading to understand how filters work in Excel for Mac.

Auto Apply

On Mac, you have an option for filter selections to take effect immediately or after you've finished making selections. The default setting is for the filter to be updated immediately as you select values in the filter. Unlike Excel for Windows, you don't need to press OK to apply the filter. Notice in our example below, the table behind the filter dialog becomes filtered immediately upon changing the selections. If you disable the 'Auto Apply' setting, then you'll need to press 'Apply Filter' when you're ready.

	A	В	С	_	D	E		F		G	Н	
1	Year 💌	Category 💌	Product 💌	Sale	s 🔻	Ratin	Ψ.					
2	2017	Components	Chains	\$20	0,000,0		75%					
3	2015	Clothing	Socks	\$	•			Categ	jory			
4	2017	Clothing	Bib-Shorts	\$	Sort							
5	2015	Clothing	Shorts	\$	5011							
6	2017	Clothing	Tights	\$:	Az	+ Asc	endin	g	Z ↓ Des	cending	g	
7	2015	Components	Handlebars	\$								
8	2016	Clothing	Socks	\$	By	color:	Nor	e			0	
9	2016	Components	Brakes	\$	Filto							
10	2016	Bikes	Mountain Bikes	\$	Filte	r						
11	2017	Components	Brakes	\$	By	color:	Nor	ne			٢	
12	2016	Accessories	Helmets	\$			0					
13	2016	Accessories	Lights	\$:	0	noose	Une					
14	2016	Accessories	Locks	\$:	C	Seal	rch					
15	2016	Components	Bottom Brackets	\$. 000					_	
16	2015	Clothing	Jerseys	\$			0-1-					_
17	2017	Components	Bottom Brackets	\$		~	(Sele	Ct All)				
18	2015	Bikes	Road Bikes	\$		\checkmark	Acces	ssories				
19	2017	Clothing	Jerseys	\$		\checkmark	Bikes					
20	2017	Accessories	Tires and Tubes	\$1	11		Cloth	ina				
21	2017	Bikes	Cargo Bike	\$	12	-	Ciotin				- 11	
22	2017	BIKES	Mountain Bikes	5		\sim	Comp	onents	5			_
23	2017	Accessories	BIKE Racks	5								
24	2017	Clothing	Caps	\$								
25	2015	Bikes	Mountain Bikes	5		Auto A	nnly				_	
26	2017	Accessories	Pumps	5.	ت	1010 1	(pp)y	J				
27	2016	Accessories	Pumps	2				Apply		Clear Fil		
28	2016	Accessories	BIKE RACKS	\$2.	4,000		0504					
29	2017	Accessories	Heimets	\$34	4,000		95%			-		_
30	2015	Accessories	Pumps	\$	/00		10%					

When to Disable Auto Apply

In most cases, 'Auto Apply' won't cause you any problem, but there are two [2] reasons you may wish to disable it:

- 1. **Personal preference:** you might find it distracting to see the filter applied as you make selections in the Filter dialog. There's no impact to the final result of your filter choices, so it's a personal preference. If you don't like seeing changes applied immediately, then just disable the option
- 2. **Performance:** if you have a large amount of data to be filtered, you may notice a delay after each selection. Excel may seem unresponsive for a short time. If this happens, you can disable 'Auto Apply' and it should avoid any slowdowns while you're making your filter selections.

You should note that your choice for 'Auto Apply' will take effect for all workbooks and will remain in effect even after you quit and restart Excel. You can change it at any time by opening the Filter dialog.

We'll continue next month...

Visual Basics

We thought we'd run an elementary series going through the rudiments of Visual Basic for Applications (VBA) as a springboard for newer users. This month, we continue our short series on some of the common traps we sometimes fall for.

This month, we're going to highlight a common issue that arises when people record macros. Suppose I have a list of employees and the salaries that they earn. I want a macro that will copy the total salary from this table and paste it elsewhere in my worksheet.

	A	В	С	D	Е
1	Amy	80000		Total Salary	180000
2	Billy	60000			
3	Charlie	40000			
4	Total	180000			

In the image above, we are looking to copy the total in B4 and paste it as values in E1. We can record a macro to do this.

```
Sub Macro1()
'
' Macro1 Macro
'
Range("B4").Select
Selection.Copy
Range("E1").Select
Selection.PasteSpecial Paste:=xlPasteValues, Operation:=xlNone, SkipBlanks _
:=False, Transpose:=False
End Sub
```

Then, when we want to insert a new name into the list, we might run into issues...

	А	В	С	D	Е
1	Amy	80000		Total Salary	100000
2	Billy	60000			
3	Charlie	40000			
4	Debbie	100000			
5	Total	280000			

Wait, what happened? The macro did exactly as we asked it to: go to cell **B4** and paste the value into cell **E1**. The trick is to make the reference to the cells dynamic instead. Instead of referring to cell **B4**, you can go to the target cell and set the Name of the cell to be something unique and relevant, for example:

B4		Ŧ	: ×
	А	В	
1	Amy	80	0000
2	Billy	60	0000
3	Charlie	4(0000
4	Total	180	0000

Sala	ry_Copy	*	: ×
	А	В	
1	Amy	80	0000
2	Billy	60	0000
3	Charlie	4(0000
4	Total	180	0000

Repeat the process for your target cell, then you can update your macro details accordingly:

```
Sub Macrol()
'
' Macrol Macro
'
'
Range("Salary_Copy").Select
Selection.Copy
Range("Salary_Paste").Select
Selection.PasteSpecial Paste:=xlPasteValues, Operation:=xlNone, SkipBlanks _
:=False, Transpose:=False
End Sub
```

A little clean-up goes a long way!

More next month...

Charts and Dashboards

It's time to chart our progress with an introductory series into the world of creating charts and dashboards in Excel. This month, we look at creating a presentation of actual vs. target sales.

Let's have some sales data for some imaginary salespeople:

	А	В	С	D	Е	F
1	Sa					
2						
3		Mary	Derek	John	Newbie	Paul
		i i i ai y	Derek			
4	Target	500	500	400	100	800

We'd like to show this in a chart. We may start by creating a basic column chart for our data. We select the data and use **ALT + F1** to insert a chart.



That's okay, but it's not really highlighting the achievements of our salespeople. We'd like to show the actual sales within the target bars. Let's start by clicking on one of the bars for the **Actual** data series.



	Mary	Derek	John	Ne	ewbie	Paul	
Target	5	00	500	400	100)	80
Actual	4	50	300 Delete	300	10)	4
	<u>و</u>		Reset to Match	Style		9+	
	900		Change Series	Chart Type			
	800		3-D <u>B</u> otation		_	7	
	500 9400		Add Data Labe Add Trendline.	ls >			
	300		Eormat Data Se	eries			
	0		▲ · 🖉 · Series	"Actual" 🗸	-		

In the Format Data Series panel, we have the option to move our series to a 'Secondary Axis'.

Let's choose this option: the bars are overlapping, but it's not making things any clearer yet!



To continue formatting, we will select the **Target** data series and go back to the 'Format Data Series' pane. This time, we are interested in the 'Gap Width' of the bars.

Format Data Serie	s 🔹
Series Options 🗸	
Series Options Plot Series On	
 <u>P</u>rimary Axis <u>S</u>econdary Axis 	
Series <u>O</u> verlap	-27% 🗘
Gap <u>W</u> idth ————————————————————————————————————	219% ្

Let's change the 'Gap Width' to 100%.



This is getting better: now we can see both bars. The sizes are not in proportion because we have two different vertical axes. We can delete the one on the right by selecting it and pressing **DELETE**.



This is more like it. Now we can work on the aesthetics. Let's pick a light green for the **Target** series and a dark green for the **Actua**l series. We can do this from the 'Format Data Series' pane. We will use the 'Transparency' property to make the fill colour of the **Target** series lighter.

Format Data Series 🔹 👻
Series Options 🗸
▲ Fill
○ <u>N</u> o fill
● <u>S</u> olid fill
○ <u>G</u> radient fill
O <u>P</u> icture or texture fill
○ P <u>a</u> ttern fill
○ A <u>u</u> tomatic
Invert if negative
<u>C</u> olor
<u>T</u> ransparency <u>50%</u>
▷ Border

Let's change the colour of the Actual series (with no transparency) and click and edit the 'Chart Title'.



We can now see at a glance how well our salespeople are doing relative to their targets. By picking light and dark colours, this would also be visible on a black and white printed document. Next time, we'll look at another way to show actual sales vs. target sales.

More next month.

Power Pivot Principles

We continue our series on the Excel COM add-in, Power Pivot. This month, we look at the SUBSTITUTE function.

Last month, we looked at the **REPLACE** function and how it can be used to replace part of a string of text in a column. However, we ran into a problem when we wanted to replace a string of text that existed in different positions in each row. For example, if we consider the following dataset:

Product ID 🔽	Product Name 🚽
1	Gloves AB
2	Helmet AB
3	Vest AB
4	Boots AB
5	Backpack AB

In this scenario, we want to replace "AB" with "New". Notice that the positions of "AB" in "Gloves AB" and "Vest AB" differ; "AB" is in the eighth character position in "Gloves AB" and is in the sixth character position in "Vest AB". In "Gloves AB", we count each letter as a character position (including blanks), hence why "AB" is in the eighth character position. When we create the following measure to replace "AB" with "New" using the **REPLACE** function:

=REPLACE(ProductTable3[Product Name],8,2, "New")

we end up with this result:

[R	eplaced New] 🗸		<pre>fx =REPLACE(ProductTable3[P</pre>	roduct Name],8,2, "New")
4	Product ID	• F	Product Name	Replaced New
1		1 G	Gloves AB	Gloves New
2		2 H	lelmet AB	Helmet New
3		3 V	/est AB	Vest ABNew
4		4 B	Boots AB	Boots ANew
5		5 B	Backpack AB	BackpacNewAB

This is because the **REPLACE** function doesn't necessarily 'look' for "AB"; it just replaces the old text starting from the specified starting character position. Cue the **SUBTITUTE** function.

Before we use the **SUBSTITUTE** function, we must understand how it works. The **SUBSTITUTE** function, like the **REPLACE** function, replaces existing text with new text in text strings in every row in a column. The **SUBSTITUTE** function is usually used to create calculated columns.

The **SUBSTITUTE** function uses the following syntax to operate:

SUBSTITUTE(text, old_text, new_text, instance_num)

where:

- the **text** parameter is the string of **text** that contains the characters that we want to substitute; this can also refer to a column that contains text
- the old_text parameter is the string of text that we want the function to look for in the text parameter
- the new_text parameter is the text string that is going to replace the old_text
- the instance_num is the instance which we want the old_text to be replaced by the next_text parameter if there are multiple old_text strings found.

Going back to the dataset mentioned earlier, we can now use the **SUBSTITUTE** function to create the following measure:

=SUBSTITUTE([Product Name],"AB","New",1)

[SUBSTITUTE] -	f_{χ} =SUBSTITUTE([Product Nar	ne],"AB","New",1)
Product ID	Product Name	SUBSTITUTE
1 :	L Gloves AB	Gloves New
2	2 Helmet AB	Helmet New
3	3 Vest AB	Vest New
4	4 Boots AB	Boots New
5	5 Backpack AB	Backpack New

The **SUBSTITUTE** function has been able to replace all the "AB" text values with "New" without being affected by the different character locations. Let's investigate the **instance_num** parameter. Here, we've added another entry to our dataset:

Product ID 🖬 Product Name 🖬
1 Gloves AB
2 Helmet AB
3 Vest AB
4 Boots AB
5 Backpack AB
6 AB Socks AB AB

Using the same **DAX** formula:

[SUBSTITUTE]	•	f_{χ} =SUBSTITUTE	[Product Nam	ne],"AB","New",1)	
Product ID		Product Name		SUBSTITUTE	T
2	2	Helmet AB		Helmet New	
3	3	Vest AB		Vest New	
4	4	Boots AB		Boots New	
5	5	Backpack AB		Backpack New	
6	6	AB Socks AB AB		New Socks AB AB	

Only the first instance of "AB" has been replaced in position six (6) of our dataset. This is because we specified '1' as our **instance_num**. If we change the **instance_num** to '2' we get:

[SUBSTITUTE] 🔫		f_{χ} =SUBSTITUTE([P	=SUBSTITUTE([Product Name],"AB","New",2)			
Product ID		Product Name		SUBSTITUTE	•	
1	1	Gloves AB		Gloves AB		
2	2	Helmet AB		Helmet AB		
3	3	Vest AB		Vest AB		
4	4	Boots AB		Boots AB		
5	5	Backpack AB		Backpack AB		
6	6	AB Socks AB AB		AB Socks New AB		

The **SUBSTITUTE** function now only replaces the second instance of "AB" it finds and ignores the first and last instance. Keep this in mind when using the **SUBSTITUTE** function: changing the **instance_num** we specify which instance of the **old_text** we want to substitute.

Power Query Pointers

Each month we'll reproduce one of our articles on Power Query (Excel 2010 and 2013) / Get & Transform (Office 365, Excel 2016 and 2019) 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 consider review how to view links in / on a webpage.

Unlike our usual Power Query article, we're going to look at something a little different. Presently, Power Query pretty much lives in the Power BI application, and some **M** functions are available from Power BI, but not necessarily – yet – supported when running Power Query from the 'Get & Transform' section of the 'Data' tab. If we need to work with webpages, then running Power Query from Power BI instead is very tempting.

To access queries from Power BI, we use the 'Edit Queries' option:



Once in the Power Query Editor, we may choose to create a query from 'New Source' in the 'New Query' section on the 'Home' tab. Let's create a new Blank Query:



In our query, we are going to use two [2] M functions that are not available when we run Power Query from Excel. The first is:

Web.BrowserContents(url as text, optional options as nullable record) as text

This returns the HTML for the specified **url**, as viewed by a web browser. An optional record parameter, **options**, may be provided to specify additional properties.

The second is:

Html.Table(html as any, columnNameSelectorPairs as list, optional options as nullable record) as table

This returns a table containing the results of running the specified **columnNameSelectorPairs** against the provided **html**. An optional record parameter, **options**, may be provided to specify additional properties.

We're going to combine these functions. To show what each one does, let's use Web.BrowserContents() first.



By using

= Web.BrowserContents("https://www.sumproduct.com/")

we can see the contents of the (in)famous website, sumproduct.com. Next, we need a step that will extract any links from this text:



This has been achieved using M code:

= Html.Table(Source, {{"Link", "a[href^=""http""]", each [Attributes][href]}})

We don't claim to have an encyclopaedic knowledge of the CSS selectors needed for this functionality – but a list of CSS selectors can be retrieved with a quick search online. This particular code searches all the <a> elements (as shown on the WebBrowserContents() example screen), where the href attribute begins 'http' (and so calls a link).

We made this brief foray into Power BI territory because these functions are useful tools, which we hope to see in Excel's Power Query / Get & Transform very soon (please?).

Until next month.

Power BI Updates

After taking the month off last time, the Power BI updates are back with a vengeance with effectively a double dose. This month witnesses a host of new features and improvements designed to enhance your data analysis and visualisation experience.

The full list of updates is as follows:

General

- Desktop start-up performance improvements
- Upgrade Power BI Desktop
- Backward compatibility is impacted by Q&A setup updates

Copilot and AI

- Get a Copilot summary directly from your Teams message with a single click
- Copilot in Power BI to write DAX queries in DAX query view updates
- Improved language understanding for data questions
- Ad hoc calculation support for data questions
- Ad hoc calculation support for data questions now available in Read mode

Reporting

- Better storytelling with Data annotations in Power BI for PowerPoint (Preview)
- Copy report object name
- Referenced column highlights for visual calculations (Preview)
- Enhancements to Reference Lines
- Category enhancements for new card (Preview)
- Introducing style presets to visuals
- Insights category for business users in the OneLake catalog
- File picker enabled on by default in Power BI Desktop
- Mobile layout auto-create now Generally Available

Modelling

- Create semantic models in Direct Lake storage mode from one or more Fabric artifacts in Power BI Desktop
- TMDL view support for Direct Lake semantic models (Preview)
- Updates to semantic model version history (Preview)
- Edit your data model in the Power BI Service updates (Preview)
- Live edit of semantic models in Direct Lake mode with Power
- BI Desktop updates (Preview)
- Use notebooks with your semantic model (Preview)

Some of the highlights include Desktop start-up performance improvements, Copilot generated **DAX** queries using user-created hierarchies, create semantic models in Direct Lake storage mode, and improved language understanding for data questions and *ad hoc* calculation support for data questions.

- Access the Azure Analysis Services migration tool from your workspace
- Table View improvements
- Distribution, discovery and consumption: CI / CD for Org Apps (Preview)
- Introducing new customisation options for organisational applications (Preview) Combined Navigation
- Live edit of semantic models in Direct Lake mode with Power BI Desktop updates (Preview)
- Semantic model changes with TMDL view (Preview)
- Azure Maps auto-zoom now includes reference layers
- Get ready for new Azure Maps tenant settings (coming soon)

Data Connectivity

- Improvement in Snowflake connector (Preview)
- Connect to the Vertica database with the user-installed ODBC driver – updates (Preview)
- Use the built-in driver to connect to the Oracle (Preview)
- Another Snowflake connector update

Mobile

• View reports linked to a semantic model directly from Power BI Mobile

Visualisations

- Drill Down Combo PRO by ZoomCharts
- Sunburst Chart by Powerviz
- Attribute Control Chart by Nova Silva
- Table with custom and grouped headers by JTA: a data scientist's visualisation tool
- Financial Reporting Matrix now with comments
- Drill Down Graph PRO by ZoomCharts
- TMap 3.0
- Lollipop Chart by Powerviz
- Strip Plot by Nova Silva.

Let's look at each in turn.

Desktop start-up performance improvements

Microsoft has been working to improve Power BI Desktop's start-up performance. Starting with the March release, you'll begin to see these improvements gradually rolled out. In particular, you should note expedition in opening both blank reports and **PBIX** reports once the improvements have been bedded down.

Upgrade Power BI Desktop

You need to upgrade to the 64-bit version Power BI Desktop to keep receiving updates and support. The 32-bit version will no longer be supported after 31 July 2025.

To continue using the Report view Copilot chat pane, upgrade to the February 2025 version. It may not work as expected for versions before February 2025 after 30 April 2025.

Backward compatibility is impacted by Q&A setup updates

Microsoft has warned that they have introduced a "version bump to the linguistic schema underlying Q&A setup tooling". No idea what that means in English! However, you should note that after installing this recent desktop release, if you continue to modify your linguistic schema in Q&A setup, such as synonyms, phrasings or suggested questions, you will not be able to open the **PBIX** files with older versions of the Power BI Desktop. Watch out!

Get a Copilot summary directly from your Teams message with a single click

The Power BI preview message in Teams chat and Outlook has been extended to include a Copilot summary with the click of a button. The new button, labelled 'Open Copilot summary in Power BI' opens the item alongside the Copilot summary. This feature enables users to understand the content of a Power BI item more easily. The button will be displayed for items that support Copilot and for users who have Copilot enabled. This feature is available on all Teams and Outlook platforms, including desktop, browser and mobile.



Copilot in Power BI to write DAX queries in DAX query view updates

Copilot in Power BI can now write **DAX** queries using user-created hierarchies and display folder names from the semantic model. Including these in your model gives Copilot additional context about how to use your data and leverages existing data structures to accelerate and improve **DAX** queries.

For instance, you can reference measures grouped in a specific folder to be shown by a hierarchy, and Copilot will generate a **DAX** query with those measures by that hierarchy with a simple user request. Using hierarchies and display folders streamlines the process of writing complex **DAX** queries. Especially in models with many measures or columns, display folders can help organise and logically group them.

Ð

	Copilot t	o help with DAX queries	Public 🗸	Q Search			Ti 2	ial: 3 days left 🦨 🍪 🛓 ? 🌮 🏠
â	Home	Help						
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Copilot to help with	2	USA	Alaska	452.31	502.27	49.96		> 🌐 Date
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	4	USA	Arkansas	451.8	502	50.2		∽ ぺ C/S hierarchy
	5	USA	California	450.72	501.35	50.63	-	Country
Power BI	 Success 	Query 1 + ss (751.3 ms) Query 1 of	1 Result 1 of 1 5 colum	ns, 58 rows	P04 00			State Or Territory + + 125%

Columns and measures can be added to display folders using the Properties pane in the Model view.

This is in addition to the recent updates allowing Copilot to understand your data better by using descriptions and synonyms on columns, tables and measures, and including sample values from columns.

Improved language understanding for data questions

The Copilot capability for answering data questions from your model has also been improved. This month includes enhancement of the language understanding layer by further leveraging a Large Language Model (an LLM) to interpret and understand common synonyms, phrasings and individual values in your model mentioned in your questions. In summary, Copilot can now understand more of your questions out-ofthe-box! Previously, certain questions required the report author to curate terms to ensure Copilot could correctly understand and answer accurately. Now, with the full power of an LLM, Copilot can understand significantly more questions out-of-the-box, saving the report author curation time and saving the Copilot user time clarifying common terms.



Before

Now

Previously, Copilot struggled to understand what 'export' could mean in relation to products and suppliers.

How many products were exported from Europe?

It's unclear what you mean by 'exported' in this context. Could you specify what you mean by exported products?

Count of products from suppliers in Europe

Total quantity of products from suppliers in Europe

List of products from suppliers in Europe

Now, Copilot understands this by default and saves the user a click to confirm this common relationship.

How many products were exported from Europe?
Showing number of products that suppliers supplied, where continent name is Europe.
77 Count of Products
BB Explore this visual A How Copilot arrived at this
You asked: "How many products were exported from Europe?"
Data used
<u>Products</u>
Filters applied (i)
Filters that match rows between tables are applied but hidden to maintain simplicity.
= <u>Continent</u> is Europe
/

Previously, Copilot needed clarification for which instance value Ana refers to, even though there's only one [1] match in the data.

Now, Copilot correctly understands and saves the user a click because there is one [1] Ana in the data, no need to clarify first to produce the answer.

 Which products did Ana buy?

 I couldn't find a specific customer named 'Ana' in the dataset. Could you specify the exact customer name or customer id?

 Which products did Ana Trujillo buy?

 Which products did customer ANATR buy?

 Show products purchased by Ana Trujillo Emparedados y helados

 Ø0

 ~ H

 You

 Data

 If He and I a



Ad hoc calculation support for data questions

Another major enhancement added to the Copilot capability for answering data questions from your model is *ad hoc* calculation support. Previously, if your question required creating new measures on the fly, not contained in the model, like a calculated column for profit or deriving the average, Copilot would not be able to respond.

This update brings over the same **DAX** query generation capability from DAX query view to the Copilot pane. Now, Copilot pane can generate **DAX** queries to answer questions that require *ad hoc* calculations.

Examples of questions might include:

- What was the year-over-year growth for sales?
- How many employees were hired before 2025?
- Calculate the ratio of cosmetic product orders to all products
- Which customers did not buy any products?

You can also verify the DAX query directly from the expanded view or launch DAX query view for further inspection.

how has changed 2012? SI	the average un I from Feb 2012 how the differer	it price to March nce
This answer the second seco	wer required more neck it carefully, Al Learn more Advanced: 0	analysis than can make Check the DAX
Based on the	available data, t	the average unit
price decrease March 2012. 1 February 2012 March 2012 it represents a c	ed from Februar The average uni 2 was 1949.9776 1 was 1761.7123 decrease of 188.	ry 2012 to t price in 5, while in . This 2653.
price decreas March 2012. February 2012 March 2012 it represents a c [Average Unit Price Feb 2012]	ed from Februai The average uni 2 was 1949.9776 2 was 1761.7123 decrease of 188. [Average Unit Price Mar 2012]	ry 2012 to t price in 5, while in . This 2653. [Difference]
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Change in Average Unit I Results DAX query	Price from Feb 2012 to N	1ar 2012	Change in Average Unit Price from Feb 2012 to Mar 2012 Results DAX query	×
This answer required more analysis	than usual. Check it carefully, Al can mak	e mistakes. <u>Learn r</u>	This answer required more analysis than usual. Check it carefully, Al can make mistakes. Learn more	
[Average Unit Price Feb 2012] 1949:90	[Average Unit Price Mar 2012] 1761.71	[Difference] -188.27	<pre>1 // DAX query generated by Patric Capital with "New has the average unit price changed from feb 2012 to file Does the difference" 2 06754 3 // Calculate the average unit price for Petruary 2012 4 Wai Adgoint OfFiciente3013 = CalCULAT(5 AREAMA('Internet Sales'(UNIT Price)), 6 'Dutr'(Year) = 2012, 7 'Data'(Year) = 2012, 7 'Data'(Year) = 2012, 9 // Calculate the average unit price for Narch 2012 9 // Calculate the average all price for Narch 2012 9 Wai Adgoint Officiente3013 = CalCULAT(11 AREAMA('Internet Sales'(UNIT Frice)), 12 'Data'(Year) = 2012,</pre>	va 20127
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			C Copy table	Copy query

It should be noted that this was originally only available from Edit Mode of reports using Copilot and was not yet available whilst using Copilot in Read mode. However...

Ad hoc calculation support for data questions now available in Read mode

Given the double hit of updates this month, Microsoft has now also added *ad hoc* calculation support to the Copilot capability for answering data questions from your model.

2012? Shi	ow the differer	analysis than	
usual. Che mistakes.	eck it carefully, Al <u>Learn more</u>	can make	
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hange in Average Unit lesuits DAX query	Price from Feb 2012 to N	Aar 2012	Change in Average Unit Price from Feb 2012 to Mar 2012 Results DAX query		
O This answer required more analysi	s than usual. Check it carefully, Al can mak	e mistakes. <u>Leam</u>	This answer required more analysis than usual. Check it carefully, Al can make mistakes. Learn more		
(Average Unit Price Feb 2012) 1949.90	[Average Unit Price Mar 2012] 1761.71	(Difference) +188.27	<pre>1 // DAX query generated by Fairic Explicit with "how has the average unit price changed from Fab 2012 to Narch 2012 Source defiference" 2 85734 3 // Calculate the average unit price for February 2012 4 WAR AppleTerretFore2012 + ALCALATE() 5 AUREGAR('Interret Sales'/UNIT Frice)), 6 'Tate('Naru' > 2012, 7 'Tate('Unit' > 2012, 7 'Tate('Unit' > 2012, 9) 9 // Calculate the average unit price for Ferch 2012. 10 WAR AppleTerretFore2012 + ALCALATE() 11 AUREGAR('Interret Sales'/UNIT Frice)), 12 - (Tate('Unit', > 2012, 13 - (Tate('Unit', > 2012, 14 - (Tate('Interret Sales'/UNIT Frice)), 15 - (Tate('Interret, > 2012, 16 - (Tate('Interret, > 2012, 17 - (Tate('Unit', > 2012, 18 - (Tate('Interret,> > 2012, 19 - (Tate('Interret,> > 2012, 10 - (Tate('Interret,> > > 2012, 10 - (Tate('Interret,> > ></pre>	,	
Based on the available data, the a Rebruary 2012 was 1949.9776, wh	verage unit price decreased from Fe ile in March 2012 it was 1761.7123.	bruary 2012 to This represents	This query calculates the average unit price of products sold online for two specific months in 2012; February and March. It then determines the difference between these two averages. First, it calculates the average unit price for February 2012 by considering only the sales data from that month and yeas. Similary, it accluates the average unit price for March 2012 using the sales data from that month and yeas. Similary, it computes the difference between the average unit price in March 2012 and the average unit price in February 2012. The result is a table showing the average unit price for February 2012, that average unit price for March 2012, and the difference between these two averages. This allows two two averages unit price is a sole of the average unit price for March 2012.	d	

Better storytelling with Data annotations in Power BI for PowerPoint (Preview)

Microsoft has also announced a public Preview of the new enhancement that allows users to make their presentations even more engaging by adding data point annotations to the visuals incorporated into their slides.



Annotations enable users to add descriptive text directly to visualisations, offering contextual explanations or highlights that improve communication and understanding. This feature transforms data storytelling by allowing users to communicate insights with greater efficacy and enhance the engagement and informativeness of presentations.

To utilise annotations, you first need to embed a single visual within the add-in in a slide. Then, simply select a data point on the visual, rightclick, and choose 'Annotate'. You can then begin typing your text. You may reference the data point's measure value and category values in the annotation, ensuring the content is connected to the actual data point. Typing '/' provides options that can be included in the annotation text.



Annotations will display whenever the data point is visible. If the visual is filtered, resulting in the disappearance of the data point, the annotation will likewise disappear. Additionally, if the data updates and the data point is no longer part of the visual, the annotation will not be shown as well.

Annotations are specific to the presentation and slide where the visual was added, allowing you to provide content that is truly in the context of your presentation.

It should be noted:

- Annotations are not supported in custom visuals
- Annotations are supported in all Power BI native Cartesians visuals
- Annotations are available only when embedding a single visual view and not a page view.

Copy report object name

The Power BI enhanced Report format (PBIR) saves the entire report definition as a folder, with each visual, page and bookmark getting saved into its own individual file. However, identifying the folder or file in the file system can be challenging, especially for visuals.



You now have the option to activate a global report setting in Power BI Desktop, enabling the ability to copy any report object name (including pages, visuals, bookmarks and filters) to the clipboard. Go to File -> Options and settings -> Report settings -> Report objects and check the box next to 'Copy object names when right clicking on report objects'.

ptions		
OBAL	Always arrange data for me	,
Data Load	Accessibility	
Power Query Editor	Always run Power Bl Desktop with improved Narrator support	
DirectQuery		
R scripting	Page alignment	
Python scripting	Align the page to the top of the wallpaper	
Security	Align the page in the center of the wallpaper	
Privacy		
Regional Settings	Format pane	
Updates	Expand all subcategories by default when you open a category	
Usage Data		
Diagnostics	Pane manager	
Preview features	Always show the pane manager	
Save and Recover	To save canvas space, show only one active pane	
Report settings	Charle un anti-	
Copilot (preview)	Start up options	
	Show the Home screen when starting Power BI Desktop	
URRENT FILE	Customize appearance (preview)	
Data Load	Change the overall appearance of your Power BI Desktop. This setting won't affect the report canvas. Share feedback	
Regional Settings	Choose an ontion	
Privacy		
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Published semantic model settings	Report objects	
Query reduction	Copy object names when right clicking on report objects	
Report settings	a opp object terres that tight eleting of teport objects	`

Once the setting is enabled, right-clicking on any report object will present the option 'Copy object name', which copies the object name to the clipboard.



You can subsequently enter the name into the search bar of Windows Explorer or Visual Studio Code to efficiently locate or identify the object name within the PBIR folder:



It is also possible to copy the report object name within the service during report editing. To do so, you must first enable the report user setting: open any report settings and enable the 'Copy object names when right clicking on report objects' option (while it's configured per report it's a user setting, you don't need to enable it for each report).

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$+ \text{ New item } \qquad \complement_{\pmb{\Theta}} \text{ New folder } \rightarrow \text{Import} \lor$	•	
l'i Name	Git stat	Modern visual tooltips
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🕐 SalesLH_Load 🞕	Synce	Default summarizations For aggregated fields, always show the default summarization type
		Copy object names when right clicking on report objects.
\$9 SalesVision_Dev (2) Last synced: 2/17/2025 at 12:31 PM 4bc	b2817	Save

When editing a report, you now have the capability to right-click on any report object and copy its name:



This functionality is beneficial not only for identifying file names in PBIR file format, but also for performance troubleshooting through Workspace Monitoring or Log Analytics to link the **DAX** query to a visual in the report.

For example, you can easily find the **DAX** query of a visual by searching for its visual name:

	Monitoring QuerySet 🕐 Confide	ntial\Microsoft Extended · Saved v Q Search	Trial: 🤇
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		/ E0E3-0E-10 10/H9/30/3/30	DEFINE VAR _DSOFILE

Referenced column highlights for visual calculations (Preview)

If you are struggling with **DAX** calculations, visual calculations are here to help to make adding calculations easier and faster. Visual calculations now include referenced column highlights to indicate the columns referred to in your visual calculation. These highlights, akin to those in Excel, will show up in the visual matrix as soon as a column is referenced, and the reference in the visual calculation formula will be marked with the corresponding colour.

For example, let's create a visual calculation that calculates the running sum of Sales Amount and resets for every year:

Running Sum = RUNNINGSUM([Sales Amount], [Fiscal Year])

When editing this visual calculation, the related column headers are highlighted:

$\times \checkmark f_X$	1 Running Su	<pre>= RUNNINGSUM([Sales Amount], [Fiscal Year])</pre>								
	Channel	Internet		Reseller		Total				
Fiscal Year	Fiscal Quarter	Sales Amount	Running Sum	Sales Amount	Running Sum	Sales Amount	Running Sum			
FY2018	FY2018 Q1	\$1,966,852.36	1,966,852.36	\$4,038,354.97	4,038,354.97	\$6,005,207.32	6,005,207.32			
	FY2018 Q2	\$1,896,267.85	3,863,120.21	\$4,027,080.34	8,065,435.31	\$5,923,348.19	11,928,555.52			
	FY2018 Q3	\$1,895,825.08	5,758,945.29	\$4,069,186.04	12,134,621.34	\$5,965,011.12	17,893,566.64			
	FY2018 Q4	\$1,813,504.11	7,572,449.40	\$4,153,820.42	16,288,441.77	\$5,967,324.53	23,860,891.17			
	Total	\$7,572,449.40	7,572,449.40	\$16,288,441.77	16,288,441.77	\$23,860,891.17	23,860,891.17			
FY2019	FY2019 Q1	\$1,311,858.70	1,311,858.70	\$8,880,239.44	8,880,239.44	\$10,192,098.13	10,192,098.13			
	FY2019 Q2	\$1,351,274.26	2,663,132.96	\$7,041,183.75	15,921,423.19	\$8,392,458.01	18,584,556.15			
	FY2019 Q3	\$1,503,144.40	4,166,277.35	\$5,266,343.51	21,187,766.70	\$6,769,487.90	25,354,044.05			
	FY2019 Q4	\$1,982,160.63	6,148,437.98	\$6,733,903.82	27,921,670.52	\$8,716,064.45	34,070,108.50			
	Total	\$6,148,437.98	13,720,887.38	\$27,921,670.52	44,210,112.29	\$34,070,108.50	57,930,999.67			
FY2020	FY2020 Q1	\$2,938,121.22	2,938,121.22	\$10,926,196.09	10,926,196.09	\$13,864,317.31	13,864,317.31			
	FY2020 Q2	\$4,269,013.83	7,207,135.05	\$9,276,226.01	20,202,422.10	\$13,545,239.84	27,409,557.15			
	FY2020 Q3	\$4,634,563.92	11,841,698.97	\$7,100,501.74	27,302,923.83	\$11,735,065.66	39,144,622.80			
	FY2020 Q4	\$3,796,090.87	15,637,789.84	\$8,937,560.86	36,240,484.70	\$12,733,651.73	51,878,274.54			
	Total	\$15,637,789.84	29,358,677.22	\$36,240,484.70	80,450,596.98	\$51,878,274.54	109,809,274.20			
Total		\$29,358,677.22	29,358,677.22	\$80,450,596.98	80,450,596.98	\$109,809,274.20	109,809,274.20			

Additionally, the referenced column highlights can be turned off and on using the matrix highlights toggle that is on the right of the Formula bar in visual calculations edit mode:

FY2018 FY2018 Q1 FY2018	1018 Q2 FY2018 FY2018 Q3 FY2018 FY201	Q4 FY2019 FY2019 Q1	FY2019 FY2019 Q2 Year	FY2019 FY2019 Q3 Quarter	FY2019 FY2019 Q4	FY2020 FY2020 Q1	FY2020 FY2020 Q2	FY2020 FY2020 Q3	FY2 Show matrix highlights
$\times \checkmark f_X$ 1 Running Sum = RUNNINGS	UM([Sales Amount], [Fiscal Year])								~

It is located on the right of the Formula bar in visual calculations edit mode.

Apparently, this is only the beginning of making visual calculations even easier to use, so stay tuned for more!

Enhancements to Reference Lines

These updates have now improved feature parity for reference lines. You can add shade areas for all reference line types:



When the reference line position is set to 'behind', the shade area will also be moved behind the chart.



For Line and Stacked Column and Line and Clustered Column charts, Power BI now supports reference lines on the y-axis. Dynamic reference lines (Min, Max, Average, etc.) are only available for Line and Clustered Column charts.



Category enhancements for new card (Preview)

The new card visual is steadily progressing towards becoming the official card, which will replace both the current card and multi-row card. This update introduces additional enhancements for categories, previously known as small multiples.

Power BI is also introducing two [2] new styles for categories: table style and cards style. The new cards style will split each category into a separate card, providing a more organised and visually appealing layout. Each style option comes with its own settings, which you can find under small multiples layout -> Layout -> Styles.



Small multiple headers for the new card visual can be placed on the left, top, right or bottom.

	0		Reset to default
¢oM	Previous m	East	✓ Small multiples header
REVENUE	\$2M 12% 7	Last	Apply settings to
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	ŏ	^	> Title

he titles of the small multiple headers can be oriented to the left, top, right or bottom.



You can now apply conditional formatting to elements of your new card based on the logic of each category.



Remember, the new card visual is still in preview, to enable this new visual, follow these steps:

- Go to File -> Options and settings -> Options
- Navigate to Preview features
- Check the option for new card visual.



Introducing style presets to visuals

Style presets are predefined formatting options that can be applied to visual elements using a custom theme file. Users may now create personalised style presets. This new feature allows users to change multiple formatting options simultaneously while eliminating the need to manually change each formatting option individually.



By creating and importing a custom **JSON** theme file that includes your desired style presets, you'll unlock a new Style presets menu option within the 'Format Visual' section of the Visualizations pane. Utilizing the Style dropdown, you can easily select any of your predefined style presets from the newly imported theme file to automatically apply formatting options to visual elements in their report, such as positioning elements or altering colours.



When crafting a custom theme file, users can specify which style preset will be the default after importing, as shown here. If no preset is selected or defined, Power BI's default settings will be applied, ensuring there are always fallback formatting options for visual elements. In the following example, **Demo Preset 1** sets the legend position to the bottom centre and changes the gridline colour of the value axis.



In this next example, **Demo Preset 2** moves the legend to the right side and changes the gridline colour and the label colour of the value axis.



An error condition will occur, as shown below, when the theme is changed, causing the report to lose the reference to the preset definitions. This results in an author-only error message indicating that the preset cannot be found.



Insights category for business users in the OneLake catalog

The 'OneLake catalog' is a centralised platform that allows users to discover, explore and manage their data assets across the organisation. It simplifies data governance and enhances accessibility, ensuring that business users, analysts and data professionals can quickly locate and utilise the resources they need.

Business users now have a dedicated Insights category, bringing together a comprehensive view of their key analytics assets. This category includes Reports, Dashboards, Organizational Applications (Apps), Fabric Insights such as Real-time Dashboards and AI Skills, and more. With this new category, users can discover actionable insights tailored to their data, improving decision-making and overall analytics engagement.

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File picker enabled on by default in Power BI Desktop

Back in January, Microsoft announced an updated file picker experience in Power BI Desktop. With this release of Power BI Desktop, the file picker will be enabled to be on by default. If you would like to revert to the old file picker experience, you may do so by navigating to options and settings and deselecting the updated file picker experience from the list of Preview items.

Mobile layout auto-create now Generally Available

Mobile-optimised report layouts provide an optimal way to view data in Power BI mobile applications. Previously, creating such layouts required additional effort. However, this is no longer the case.

The mobile layout auto-creates is now Generally Available: you can generate a mobile-optimised layout with a click of a button. This feature allows you to easily create mobile-optimised layouts for any new or existing report page, saving you time.

When you switch to the mobile layout view in Power BI Desktop, if the mobile canvas is empty, you can generate a mobile layout just by selecting the Auto-create button. The Auto-create engine understands the desktop layout of your report and builds a mobile layout that considers the position, size, type and order of the visuals that the report contains. It places both visible and hidden visuals, so if you have bookmarks that change a visual's visibility, they will work in the automatically created mobile layout as well.

You can edit the automatically created mobile layout, so if the result is not exactly what you expected, you can tweak it to make it perfect for your needs. Think of it as a starting point you can use to shorten the way to that effective, mobile-optimised report you envision.



Create semantic models in Direct Lake storage mode from one or more Fabric artifacts in Power BI Desktop

The public Preview of creating semantic models using Direct Lake storage mode in Power BI Desktop has also been announced. Direct Lake unlocks massive data with quick query performance without having to manage data refreshes and without causing data duplication. For the first time with Direct Lake semantic models, you can add tables from multiple OneLake data sources, giving you the flexibility to combine data for your needs to create your Power BI reports.

You may create these Direct Lake semantic models in just a few clicks in Power BI Desktop. With the Preview feature turned on, select a Lakehouse or Warehouse from the 'OneLake catalog' and then 'Connect'.

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Direct Lake semantic models read the OneLake data directly and are created in the workspace. Give the semantic model a name, pick a workspace and select the tables you want to include, and then click OK.

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Direct Lake semantic model from Desktop	
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The semantic model is created in the workspace and you will now be live editing the semantic model in Desktop.

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To bring in other tables, return to the 'OneLake catalog' and pick another Lakehouse or Warehouse. Similar to when you created the semantic model, just pick a Lakehouse or Warehouse and click 'Connect'. It's added to the semantic model. You may also add relationships, measures, calculation groups and hierarchies. DAX query view is also available to view data in the tables and try out calculations.

TMDL view support for Direct Lake semantic models (Preview)

You can now use the Tabular Model Definition Language (TMDL) view to edit your semantic model in Direct Lake mode. TMDL view not only can provide a code-first semantic modelling experience but also enable unique scenarios, such as altering the Lakehouse connected to the semantic model.



Please note that if you rename or remove an object using TMDL view, it is essential to include Power BI metadata annotations changed Property and PBI_RemovedChildren to ensure your customisations are retained the next time you synchronise your Direct Lake semantic model with the Lakehouse.

Updates to semantic model version history (Preview)

The Preview of semantic model version history is coming soon and will include support for Pro workspaces. This feature aims to empower selfservice users by providing confidence to recover from critical mistakes when editing semantic models on the web. In this Preview, versions will be automatically captured in an Office-like history pane for your webedited semantic models. You can easily select and restore any of these previous versions of your semantic model.

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Additionally, you have the option to manually save versions to the version history for your semantic model.



Edit your data model in the Power BI Service – updates (Preview)

With the release of semantic model version history for pro workspaces, Microsoft will start enabling the workspace-level Preview feature for editing data models in Power BI Service shortly. The Users can edit data models workspace setting will be turned on by default for Pro workspaces. If you prefer, you can still disable the workspace preview for your workspace, but it is recommended to keep it enabled. Power BI administrators will still have the ability to enable or disable data model editing in the Service for the entire organisation or specific security groups through the admin portal.

Live edit of semantic models in Direct Lake mode with Power BI Desktop – updates (Preview)

In this update you can now seamlessly open your Direct Lake semantic models for editing in Power BI Desktop directly from the web. Just like in Office products, simply select the 'Edit in Desktop (preview)' option from

the web to launch Power BI Desktop with the same Direct Lake model open and you will be ready for editing.



Use notebooks with your semantic model (Preview)

One-click experiences have been introduced that make it easier than ever to start using Fabric notebooks and semantic link to analyse your semantic models on the web. Simply choose one of Microsoft's preconfigured notebooks and the software will handle the creation and configuration, allowing you to run analysis against your semantic model.



Microsoft is also offering the following out-of-the-box experiences for your semantic models:

• Best Practice Analyzer: when you run this notebook, the 'Best Practice Analyzer' (BPA) will offer tips to improve the design and performance of your semantic model. By default, the BPA checks a set of 60+ rules against your semantic model and summarises the results. These rules come from experts within Microsoft and the Fabric Community. You'll get suggestions for improvement in five [5] categories: Performance, DAX Expressions, Error Prevention, Maintenance and Formatting

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• **Memory Analyzer:** when you run this notebook, the 'Memory Analyzer' will show you memory / storage statistics about the objects in your semantic model (*i.e.* Tables, Columns, Hierarchies, Partitions and Relationships). These statistics may be used to identify areas of performance optimisation and memory reduction for your semantic model.

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Additionally, take note of the new Power BI Community notebooks gallery too. Here, you may explore and submit notebooks you've created to enhance your Power BI data analysis and reporting with the rest of the Power BI community.

Access the Azure Analysis Services migration tool from your workspace

You can now access the Azure Analysis Services (AAS) migration tool from your Fabric workspace by clicking the 'Migrate' button and selecting the 'Data model' card. The AAS migration is an easy-to-use migration solution that enables the migration of models from AAS servers to workspaces in Fabric.

It allows customers to migrate their models at a click of a button, as well as utilise server redirection capabilities to automatically redirect client-tool connections from an existing AAS server to a model residing in Fabric. This creates a migration experience that reduces the impact to downstream users, reports and automation processes, allowing customers to leverage the capability suite of Power BI and Fabric.

To get started:

- Migrate Azure Analysis Services to Power BI
- Migrate from Azure Analysis Services to Power BI Premium
- Migrate from Azure Analysis Services to Power BI Premium: Migration scenarios.

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Table View improvements

Microsoft has made new improvements to the Table View in Power BI Desktop. Now, simply right-click on any cell to access a variety of options, including copying the entire table, a specific column, just the cell's value or using keyword shortcut of **CTRL + C** for the values. With this update, you can extract individual cell values directly, eliminating any need for extra steps and making your workflow more efficient.

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Distribution, discovery and consumption

Support for Fabric Git integration and deployment pipelines for org apps is now in Preview.

With Git, you can develop and version organisational applications ("org apps") with ease. Org app developers may manage and version org apps based upon their development processes.

With deployment pipelines, you can test and deploy org apps with confidence. Org app authors and developers can develop, test and review in staged workspaces before deploying to final production workspaces, with user access uniquely managed per org app item in each staged workspace.

GIT INTEGRATION FOR ORG APPS (CONTINUOUS INTEGRATION): CI / CD for Org Apps (Preview)

With continuous integration (CI), Git integration Microsoft Fabric empowers org app developers to seamlessly integrate their development processes, tools and best practices directly into the Microsoft Fabric workspace. Setting up Git is as easy as a couple of clicks. Configure the Git repository and branch details in the workspace settings to set up a connection. Once set up, commit org app changes with confidence, knowing you can version or branch as you iterate on org app items and included items in your workspace.



Git enables org app developers to:

- backup and note the version of their org app item, along with included items
- see version history and revert to previous versions of org apps and included content as needed
- collaborate on org apps with others or iterate on your own using Git branches
- automate or script tasks around your processes.

DEPLOYMENT PIPELINES FOR ORG APPS (CONTINUOUS DEPLOYMENT [CD])

Items included in an org app (Preview), like reports, use the source item in the workspace for display in the org app, unlike workspace apps that display versioned copies of included items after workspace app update. To date, workspace applications have allowed report authors to iterate on reports across just two [2] stages without impacting the published copy of the report in a workspace application. Now, with deployment pipelines support for org app items, you can create, manage and deploy in stages that match your workflow. Compared to workspace applications that support just two [2] stages, org apps support for deployment pipelines gives you the flexibility to add several stages based on your needs.

For example, after changes have been finalised, Fabric deployment pipelines enable org app authors or developers to automate or manually control the deployment of changes across different workspaces used for:

- 1. Development
- 2. Testing
- 3. Review
- 4. Production stages.

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Deployment pipelines enable org app authors and developers to:

- ensure that org apps are in synchronisation with earlier stages
- verify and deploy changes quickly and reliably
- use 'Select related' to ensure items included in the org app are also promoted during deployment
- reduce the risk of errors and conflicts that might arise from manual interventions or inconsistent configurations
- compare org apps across different environments
- ultimately, ensure the delivery of quality org app experiences to your org app consumers.

Deployment pipelines empower teams to produce updates in short cycles with high speed, frequency and consistency. Changes can be promoted at any time with a single click.

Introducing new customisation options for organisational applications (Preview) – Combined Navigation

Microsoft is continuing to enhance your ability to customise org apps with the release of the combined navigation setting. This new functionality allows org app authors to have more control over their consumer experience by offering several navigation configurations. experience, you can now choose to show a single pane with report pages within the app navigation pane, eliminating the need for two [2] separate navigation panes. This means that the pages of reports will be shown underneath the reports listed in the org app navigation pane, providing a more streamlined and cohesive user experience.

Previously, org apps had separate navigation panes: one for the org app itself and another for the report in view. With the combined navigation



Covered in the original org apps (Preview) announcement, org apps offer a level of customisation beyond workspace apps. By adding this new combined navigation option you can customise an org app even more. Starting with whether you prefer to have the org app navigation collapsed or expanded by default. You may even turn off the org app navigation completely. For those who prefer to show org app navigation, the combined navigation experience offers additional flexibility and control. Alternatively, when a report is in view, you can choose to show a separate navigation of pages in the report. You can explore these configurations and other combinations for your org apps. This level of customisation ensures that you can create a unique and tailored experience for different groups within your organisation.

This new option of combining the org app navigation and report navigation is like the previous version of org apps offered, known as workspace apps. Workspace apps allowed for a unified navigation experience and the combined navigation experience in org apps builds on that foundation by providing even more customisation options. By combining the navigation panes, org app consumers can enjoy a seamless and efficient way to access and interact with data in your org apps that may be familiar to them from workspace apps.

Live edit of semantic models in Direct Lake mode with Power BI Desktop updates (Preview)

Coming soon, the changes you make to layouts for your Direct Lake model will persist and be displayed consistently between Desktop and the Service, specifically:

- changes made to Direct Lake semantic model layouts in Desktop will be reflected when opening the same model in the Service
- changes made to Direct Lake semantic model layouts in the Service will be reflected when opening the same model for live editing in Desktop.

Semantic model changes with TMDL view (Preview)

TMDL view allows you to preview script changes by showing a preview of the semantic model before and after script execution as a **TMDL** code diff. For the uninitiated, a "**TMDL** diff" refers to a comparison or difference between two versions of a **TMDL**, often used to track changes or progress made in implementing the plan. This is particularly useful when copying scripts from others, allowing you to assess their impact before running them against your semantic model.

Clicking the Preview button next to Apply shows a **TMDL** diff of the semantic model before and after executing the **TMDL** script in the opened tab:

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The preview is read-only, but you can keep editing your script. To refresh the preview after changes, click 'Update preview'.

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The top right toolbar lets you navigate code diffs, switch between inline or side-by-side views, hide unchanged regions and close the preview.

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Azure Maps auto-zoom now includes reference layers

The Azure Maps Visual now includes an auto-zoom feature that automatically zooms into areas where reference layers are plotted. When users apply slicers, the visual will zoom directly into the filtered polygons, allowing for faster navigation and improved focus on relevant geospatial data. This enhancement significantly boosts efficiency and helps users quickly gain insights from their maps.



This will be the new default experience, but you can always turn it off using the new 'Include reference layer' option in the View card of the Map settings section of the Formatting pane. For existing map visuals, you'll need to enable the feature manually.

✓ View	
Auto zoom	On •
Include reference layer	On O

Get ready for new Azure Maps tenant settings (coming soon)

Beginning in June, Power BI will introduce new tenant settings for the Azure Maps visual, giving you more control over data residency and compliance. These more granular tenant settings will let you independently control:

- whether data can be processed outside your tenant's geographic region
- the use of certified Microsoft Online Services sub processors (used by the selection tool).

Improvement in Snowflake connector (Preview)

However, to take advantage of these changes, there is an important step: your organisation must be on the April version of Power BI Desktop (this release) or later.

If you're still using an older version of Power BI Desktop in June, Azure Maps visuals will no longer work in your reports when viewing them in Desktop. Don't wait: upgrade now to be ready for the enhanced governance controls and avoid disruptions.

This month, Power BI continues to enhance this connector to further boost its performance to provide better experience. You can upgrade to the latest version to evaluate these enhancements.

Connect to the Vertica database with the user-installed ODBC driver - updates (Preview)

In February 2025, a new option was introduced to Power BI to use the user-installed ODBC driver to connect to Vertica database. With this release of Power BI Desktop, this option will be enabled by default, you will need to install the ODBC driver on your machine to use the Vertica database connector in Power BI Desktop.

If you would like to revert to the old built-in driver experience, you can navigate to 'Options and settings' and deselect the 'Use user-installed Vertica ODBC driver' option.

Use the built-in driver to connect to the Oracle (Preview)

This month Microsoft is introducing a new option for getting data from the Oracle database using a built-in Oracle driver, currently available in Preview. This feature removes the necessity for users to install and manage the driver, allowing you to utilise the Oracle managed **ODP.NET** driver included with Power BI Desktop.

Another Snowflake connector update

Starting from the March 2025 version of Power BI Desktop, the 'New Snowflake connector implementation' option is enabled by default, so that all the newly created connections utilise ADBC to connect to Snowflake. Your existing connections will remain unchanged.

View reports linked to a semantic model directly from Power BI Mobile

Previously, Microsoft added support to view semantic models from the Power BI Mobile apps, so users would be able to track the model status and trigger on-demand refresh when needed. Now, the company is adding to the semantic model the ability to see which reports are connected to it as well.

Understanding which reports were created from a semantic model in Power BI is crucial for several reasons. It ensures the consistency and reliability of the data being used across different reports. When users know that the reports are linked to sa common semantic model, they can trust that the metrics and calculations are standardised. This is particularly important in collaborative environments where multiple stakeholders rely upon accurate data to make informed decisions.

To see the connected reports, open any semantic model in the app, and select 'Linked content' from the information pane. You can now view related reports you have access to, including those from different workspaces. The origin workspace of each report is shown below its name.

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Drill Down Combo PRO by ZoomCharts

Combo PRO is a multi-tool for visualising categorical data. You may combine up to 25 series on the same chart, choose between three [3] chart types for each series and create stacks and clusters to build the perfect visual for your report – even chart types like Clustered Column charts, Histograms, Lipstick charts and many others.

Main features include:

- combine up to 25 series of columns, lines, and areas
- vone-click drill down
- intuitive on-chart interactions
- split by 'Legend'
- show additional insights with the 'ToolTip content' field
- rich customisation (axes, series, legends, labels, ToolTips and more)
- up to four [4] threshold lines or areas
- conditional formatting.

Drill Down Combo PRO

Furthermore, you can create a category hierarchy with multiple columns, which will allow you to drill down with just a click or tap directly on the chart. Combo PRO provides intuitive user experience with full touch support, and it cross-filters with other visuals to provide instant insights that enable swift and fully informed decisions.



ONE VISUAL. ENDLESS POSSIBILITIES.

Visualize data your way with up to 25 series and 3 chart types (columns, lines, areas). Customize every aspect - stacking, clustering, colors, labels, legends, tooltips, and more.









Make your reports more interactive and provide better insights to your users.





Sunburst Chart by Powerviz

Powerviz's Sunburst Chart is an interactive tool for hierarchical data visualisation. This chart visualises multiple hierarchy columns, revealing part-to-whole relationships with a concentric circle design.

Key features include:

- Arc customisation: customise arc shape, patterns and formatting for unique designs
- Colour scheme: 30+ colour palettes, including colour-blind safe mode
- Centre circle: design an inner circle with layers. You may add text, measures, icons and images
- Ranking: filter Top / Bottom N values, with "Others"
- Conditional formatting: easily identify outliers based upon measure or category rules
- Labels: smart, readable data labels inside or outside shapes
- Image labels: add an image as an outer label
- Interactivity: zoom, drill down, cross-filtering and ToolTip features
- Sequences: clearly view which level is being explored
- Control ToolTip visibility: add and apply ToolTips globally or by level.
- Other features included are annotation, grid view, show condition and accessibility support.

Business use cases include:

- Sales and marketing: market share analysis and customer segmentation
- Finance: departmental budgets and expenditures distribution
- Operations: supply chain management
- Education: course structure, curriculum creation.

Try Sunburst Chart for FREE from AppSource.



Attribute Control Chart by Nova Silva

Earlier this year, Nova Silva introduced the Attribute Control Chart for Power BI, designed to empower users with advanced quality control insights. Initially, it supported the foundational attribute chart types, including the c chart, u chart, Laney u chart, p chart, Laney p chart and np chart.



Now, expanded capabilities have been announced with support for Rare Event Control Charts — specifically, the T chart and G chart. These charts are essential for monitoring events that occur infrequently, allowing for more nuanced control in scenarios where traditional control charts may not be sensitive enough. The T chart helps monitor the time between rare events, while the G chart tracks the count of opportunities between events. These new additions make the Attribute Control Chart even

more versatile, enabling organisations to gain insights into low-frequency incidents, which are often critical yet challenging to monitor.

By expanding Power BI's Attribute Control Chart functionality, Power BI continues to support diverse business needs, helping teams identify issues promptly and maintain high-quality standards across all processes.

You can download it from AppSource and try it for free.

Table with custom and grouped headers by JTA: a data scientist's visualisation tool

This visual allows you to create structured tables while grouping columns under custom headers that act like categories, improving readability and making complex datasets easier to analyse.

Key features include:

- Custom header grouping: organise column headers into general and sub headers for better structure
- Hierarchical row display: present rows in a hierarchical format and control which levels to collapse or expand
- Flexible column organisation: group columns under sub headers and main headers for improved clarity
- Adjustable header visibility: hide general headers whilst keeping sub headers visible
- Table totals display: show or hide totals for better summarisation
- Advanced formatting options: Customise background and font colours for specific headers
- **Display unit formatting:** adjust numerical values to suit your reporting needs.

This may be downloaded for free from AppSource.

Table with Custom and Grouped Headers by JTA



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North America	USA	Texas	Dallas	1340000	79	36	240000000	85000	70	7	70
North America	Canada	Ontario	Ottawa	934243	80	40	1500000000	95000	115	12	50
North America	USA	California	San Francisco	883305	81	38	350000000	100000	120	8	60
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<u>JTA</u>

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Customize to Fit Your Needs!



Financial Reporting Matrix now with comments

Making financial statements with a proper layout has just become easier with the latest version of the Financial Reporting Matrix. Starting from version 8.1, you can now add comments to the cells, explaining the values to the readers.

Cells containing a comment will show an indicator like what you are used to seeing in Excel. The visual will also show comments indicator, marked with red, on how many comments are present with the current filter context.

	2022				
	Actuals	Budget	Diff		
⊞ Sales	24,866,150	25,600,162	-734,012		
Other Operational Income	-146,000	-144,269	-1,731		
Total Operating Income	24,720,150	25,455,893	-735,743		
⊞ Cost of Goods	3,308,310	3,185,256	123,054		
Change in stock WIP FG		-			
Payroll and social Cost	24,089,991	28,534,742	-4,444,751		
Other Operating Expenses	5,178,662	5,516,800	-338,138		
Total Operating Expenses	32,576,963	37,236,799	-4,659,836		
Operating Profit	-7,856,813	-11,780,906	3,924,093		
Operating Margin	-31.8%	-46.3%	-533.4%		
Earnings from ass.companies		-			
Other Financial Income	29,147	29,401	-254		
Interest Income	14,398	15,802	-1,404		
⊞ Interest Expenses		-			
Other Financial Cost	169,867	169,448	419		
Net Financial Items	-126,322	-124,245	-2,077		
Depreciation and Amortization	-	-	-		
Net Income before Taxes	-7,983,135	-11,905,151	3,922,016		
⊞ Income Taxes Ordinary		-			
Net profit loss	-7,983,135.00	-11,905,151.19	3,922,016.19		

		2022	
	Actuals	Budget	Diff
⊞ Sales	24,866,150	25,600,162	-734,012
Other Operational Income	-146,000	-144,269	-1,731
Total Operating Income	24,720,150	25,455,893	-735,743
Cost of Goods	3,308,310	3,185,256	123,054
Change in stock WIP FG		-	-
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		-	
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Net Financial Items	-126,322	-124,245	-2,077
Depreciation and Amortization			-
Net Income before Taxes	-7,983,135	-11,905,151	3,922,016
Income Taxes Ordinary		-	-
Net profit loss	-7,983,135.00	-11,905,151.19	3,922,016.19

← Sales 2022 > Diff -734,011.73			×
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Created 02/06/25			
Why are we so far behind budge	t?		
v 1 reply			
Joakim	Û	0	
Created 02/06/25			
Because we didn't get to hire	all th	e	
sales people we planned to hi	ire.		
Anders	Û	0	
Created 02/06/25			
An, I see that we are spending	less	on	
Payroll than budgeted. Got it.			

<mark>2</mark>

...Type in a new reply

Click the comment indicator, select a cell, and write your comment, it's as easy as that!

The new version also includes:

- Support for Power BI Tooltips, including using Report pages as ToolTips
- Improved conditional formatting options: name your formatting steps and with the new 'custom' style option you are no longer limited by the number of unique styles you can apply
- Data limit: the default has been 3,000 rows, now the developer is free to adjust that to a maximum of 30,000 rows. The trade-off can be the performance of the visual so use it with caution.

Applied steps $\land \lor$									
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Conditional Formatting									
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Apply to									
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Number V 0									
Add Optional Condition \vee									
Apply style: 🛛 Default 🧿 Custom									
BIUS 8 V A none V									
Cancel Apply									

This is in addition to the already existing features of the Financial Reporting Matrix:

- Adding custom rows
- Applying company / customer specific themes
- Expand / collapse columns
- Conditionally hide columns.

Highlighted new features:

- Data limit
- Commenting
- Conditional formatting
- ToolTips Report page.

You can download it from AppSource and try it for free.

Drill Down Graph PRO by ZoomCharts

You can visualise your graph-structured data in an interactive way with Drill Down Graph PRO. This visual combine powerful data analysis capabilities with user-friendly UI, incredible configurability and seamless cross-filtering. Benefits include:

- Graph data structure: Graph PRO will identify relationships between source nodes and target nodes and connect related nodes with links
- Focus nodes: simplify complex graphs by assigning 'focus node' status to specific nodes. You can then choose to initially display only focus nodes, allowing the user to expand them on-demand
- **Multiple layouts:** choose between five [5] layout modes: Dynamic (force-directed), Big Data Dynamic, Hierarchy, Radial and Static. You can also enable a toolbar button so users can switch layouts on-the-fly
- Full customisation: enjoy full control over the look and feel of your graph, including navigation, legends, labels, nodes, links, ToolTips and more. You can also create nodes and link categories in data to apply separate appearance settings for each
- Auras: visually highlight node groups (even if they are not linked directly) with colourful auras
- Data-driven customisation: use various optional fields to provide label and ToolTip content, and apply customisation rules to nodes and links (including colour, shape, size, images and more).

You can download it from AppSource and try it for free.







CONFIGURE EVERY DETAIL

Explore 200+ customization settings for nodes, links, labels, legends, navigation and more, and use various optional fields to provide formatting rules directly from data.



TMap 3.0

The newly released TMap 3.0 has added new features for combining a symbol or chart with choropleth map to create symbol choropleth map or chart choropleth map. Combining proportional symbols and choropleth Map into one map will help data professionals to explore insights at both regional and individual location level just from one visual.



This Symbol Choropleth Map shows population for census metropolitan areas and their summation for each province in Canada. Combining charts and choropleth map will help to explore spatial correlations among many variables through multivariate geovisualisation.



This Chart Choropleth Map shows relations between GDP and population across six [6] continents.

A top marker layer, a linked polygon layer and five [5] reference layers can be added to the TMap visual to make various thematic maps to explore geospatial and business intelligence. The data source for the linked polygon layer can be WKT (Well-Known Text) data in data model or built-in boundary data inside the visual or uploaded shape / geojson file.

Again, this may be downloaded from AppSource.

Lollipop Chart by Powerviz

The Powerviz Lollipop chart is a variation of a Bar chart that uses lines and dots to represent data points. It is useful for highlighting specific trends to help stakeholders make informed decisions.

Key features include:

- **Chart options:** easily switch between vertical / horizontal chart
- Marker style: choose from Shapes, Charts, Icons, Images or upload a custom image
- Reference lines / bands: add reference lines and bands to highlight values easily
- Small multiples: split your visual into multiple smaller visuals
- Fill patterns: highlight nodes with patterns or upload your own
- **Race chart:** enhance the chart by adding animations to show data changes over time
- Cut / clip axis: trim / adjust the axis to accommodate the outliers
- **Dynamic deviation:** analyse the deviation between two [2] bars briefly
- Conditional formatting: find outliers by using rules for measures or categories based upon rules
- **Templates:** choose from predesigned templates and save time
- Other features included are Error Bars, Preview Slider, Import / Export Themes, Data Colours with IBCS Support, Ranking, and more.

Business use cases include sales analysis, financial reporting and market research.

More on AppSource.





Strip Plot by Nova Silva

The Strip Plot is an essential tool for uncovering patterns in categorical and numerical data, allowing users to visualise the distribution of individual data points effectively. With the latest update, Nova Silva has supercharged the Strip Plot with powerful new features that enhance clarity and flexibility.

New in this update:

- Jittering: say goodbye to overlapping points! Jittering slightly shifts data points to improve visibility, ensuring that every value in your dataset is accounted for
- Box plot: combine summary statistics with raw data by overlaying a box plot on your Strip Plot. Now, you can easily spot medians, quartiles and outliers while maintaining full visibility of individual data points
- Vertical layout: previously limited to horizontal orientation, the Strip Plot now supports a vertical layout, making it even more versatile for different analytical needs.



Now you can use jittering to avoid overlapping points



···i Nova Silva





These enhancements empower users to gain deeper insights from their data, making trend identification and anomaly detection easier than ever. Try the updated Strip Plot in Power BI today and take your visual analytics to the next level. You may download it now from the AppSource.

More next month.

New Features for Excel

This month's updates see Python in Excel now Generally Available to eligible Enterprise and Business users in Excel for the web and in Preview for Family and Personal users. The **TRIMRANGE** function and other accompanying trim references are now available to all Windows users and iOS Insiders can now open shared files on iPhone and iPad without a Microsoft account.

Here is the list:

Excel for Windows

• TRIMRANGE and other accompanying trim references

Excel for Windows and web

- Python in Excel
- Copilot in Excel with Python

Excel for Windows and Mac

• Open shared Excel, PowerPoint and Word files on iPhone and iPad devices without a Microsoft account (Insiders).

Let's get started.

TRIMRANGE and other accompanying trim references

We mentioned this nine months ago initially! Microsoft has introduced a new function and a set of supporting references:

- the TRIMRANGE function: a function that removes empty rows and columns from the edges of a range.
- trim references: these offer a more succinct way to call common variations of the TRIMRANGE function.

This feature has now rolled out to all Windows Current Channel (CC) and Monthly Enterprise Channel (MEC) users.

TRIMRANGE scans in from the edges of a range or array until it finds the first non-blank cell (or value). It then excludes those blank rows or columns. It should be noted that **TRIMRANGE** and the associated new reference operators are not text functions, so they are not going to be useful for cell contents, such as line breaks or carriage returns.

The syntax is as follows:

TRIMRANGE(range, [trim_rows], [trim_columns])

It has three [3] arguments:

- range: this argument is required and represents the range (or array) to be trimmed
 - trim_rows: this argument is optional and determines which rows should be trimmed by selecting one of four [4] values:
 - o **0:** none
 - o 1: trims leading blank rows
 - o 2: trims trailing blank rows
 - o 3 (default if omitted): trims both leading and trailing blank rows
- trim_columns: this argument is optional and determines which columns should be trimmed by selecting one of four [4] values:
 - o **0:** none
 - 1: trims leading blank columns
 - **2:** trims trailing blank columns
 - 3 (default if omitted): trims both leading and trailing blank columns.

In essence, the **TRIMRANGE** function removes empty rows and / or columns from the edges of a range. This can be particularly useful when writing dynamic array formulae or optimising aggregation, array or lambda functions for performance.

We think **TRIMRANGE** may have missed a trick here in its initial Preview guise as we think of the **TRIM** function which removes excess space, not

just at the beginning and end of a text string but throughout. We can't help feeling options to remove blank rows / columns throughout the range might be welcomed by many and feel there are many areas where this would be beneficial (*e.g.* charting, dashboards, summary outputs).

In the example below, **TRIMRANGE** has been used to calculate the length of any text entered into column **A**:

	A	В	С
1	Eggs		4
2	Milk		4
3	Butter		6
4	Bananas		7
5	Cookies		7
6			

=LEN(A1:A5)

However, we might wish to extend the range to add more words in column **A**, and this can lead to redundant calculations and possibly slower performance as the spreadsheet becomes more complex.

	A	В	С	D
1	Eggs		4	
2	Milk		4	
3	Butter		6	
4	Bananas		7	
5	Cookies		7	
6			0	
7			0	
8			0	
9			0	
10			0	
11			0	

This is where the formula

=LEN(TRIMRANGE(A:A))

can come to the rescue and remove unused calculations (but reinstate them later if more text is added in column A):

	A	В	С	D
1	Eggs		=LEN(TRIMF	RANGE(A:A))
2	Milk		4	
3	Butter		6	
4	Bananas		7	
5	Cookies		7	
6			0	
7			0	
8			0	
9			0	
10			0	
11			0	

Easy!

	A	В	С
1	Eggs		4
2	Milk		4
3	Butter		6
4	Bananas		7
5	Cookies		7
6			

Without the use of TRIMRANGE,

=LEN(A:A)

would calculate for every cell in column **C**, returning over a million unnecessary results. Besides being inefficient, trailing undesirable zeroes are returned to the grid. This can be especially problematic if you then try and operate on the spill using **=C1#** notation.

TRIMRANGE is also a useful tool for optimising the performance of lambda functions that operate on ranges. No doubt Microsoft has some particular scenarios in mind here (more new dynamic array functions soon possibly?). It allows lambda authors to more tightly scope ranges, which can reduce the number of required computations.

We don't have this function ourselves yet, but anecdotal evidence suggests this function will not work with three-dimensional references, but it does seem to work with arrays as well as ranges. We shall do more testing as and when we can!

This new function has provided Microsoft with the opportunity to introduce **Trim References**, also known as **Trim Refs**. These may be used to achieve the same functionality as **TRIMRANGE** more succinctly by replacing the range's colon ":" with one of the three Trim Ref types described below:

Туре	Example	Equivalent TRIMRANGE	Description
Trim All (.:.)	A1.:.E10	TRIMRANGE(A1:E10,3,3)	Trim leading and trailing blanks
Trim Trailing (:.)	A1:.E10	TRIMRANGE(A1:E10,2,2)	Trim trailing blanks
Trim Leading (.:)	A1.:E10	TRIMRANGE(A1:E10,1,1)	Trim leading blanks

Full-column references are often avoided because they can have poor performance with some functions. However, with Trim Refs, they are much more performant as the full-column reference can be constrained to just the portion with values.

Python in Excel

Python in Excel is now Generally Available for Windows users of Microsoft 365 Business and Enterprise. It is also in Preview for Family and Personal users. You may now create, edit and recalculate Python formulae in any workbook on your browser, along with Windows.

If you recall, last August, in partnership with Anaconda, Microsoft introduced an exciting new addition to Excel by integrating Python, making it possible to seamlessly combine Python and Excel analytics within the same workbook, with no setup required. Since then, the feature has been extended with the advent of popular Python analytics libraries such as pandas, Matplotlib and NLTK to countless Excel users.

With Python in Excel, users may harness advanced analytics for visualisations, data cleaning, machine learning, predictive analytics and more. Here are just some examples.

LEVERAGE PREDICTIVE ANALYTICS

Advanced modelling capabilities in Python offer detailed and flexible optimisation analysis, such as Monte Carlo simulations. These capabilities allow users to handle complex scenarios, providing deeper insights into their data. For instance, here is an illustration depicting simulations analysis using Monte Carlo sampling for possible project expenses.



VISUALISE NETWORK CONNECTIONS

NetworkX is a powerful tool for creating and analysing complex networks, offering flexibility to model and visualise relationships between nodes effectively. Here is an illustration using network models to view changes over time:



PARSE NATURAL LANGUAGE

The NLTK and word cloud libraries in Python provide robust tools for text analysis and visualisation. NLTK excels in natural language processing tasks, while word cloud generates visually engaging representations of textual data, such as extracting and examining text to derive insights.



MODERN EDITING

A great Python experience requires modern editing. This includes new features like syntax highlighting, code completion and aid when referencing data with the **xl()** function - all of these have been added directly to the Formula bar. Furthermore, Microsoft has recently announced the Python Editor, a new surface that is a great companion for authoring code and leverages many of the same experiences found in Visual Studio Code. Here you may manage all your Python formulae from a single location.



Copilot in Excel with Python

Copilot users can use Copilot in Excel with Python to do advanced analysis as well. This is now rolling out to Mac Insiders too. With Copilot, you can use natural language to describe the analysis you want to perform and it will automatically generate, explain and insert Python code into your Excel spreadsheet accordingly. This means you will be able to dive deeper into your data with Copilot in Excel with Python – yet know very little about Python!



Open shared Excel, PowerPoint and Word files on iPhone and iPad devices without a Microsoft account (Insiders)

Microsoft is extending anonymous file sharing to iPhone and iPad. Now, collaborators you've shared files with are able to open them on their iPhone and iPad devices, even if they don't have a Microsoft account, although files shared using an Enterprise account will still require recipients to sign in.

When sharing files with others using your personal Microsoft account, recipients have been able to open them in Excel, PowerPoint and Word for the web even if they don't have a Microsoft account. This is now

To implement:

- Make sure you are signed into your personal Microsoft account
- Open an Excel, PowerPoint or Word file that you want to share
- Select Share -> Link settings (the gear icon in the top-right corner), ensure that either the 'Anyone with the link can edit' or 'Anyone with the link can view' option is selected, and then select the Apply button



	🚾 Recipe	e for Delicious Brow	mies 🐐 🥝		0 ę	Buy Mi	crosoft 365	٢	
File	Home Inse	ert Layout Re	ferences Review View Help	Comments	-1+ Cab	ch up	0 Editing ~	85 Sh	are 🗸
2 C Undo	Paste	Aptos (Body) B I ⊻ ab Ab × ∀ × ▲ × Fort		Q, Find ↓ Replace ▷ Select ↓ Editions	Uictate	Editor Proofing	Acid-ins Add-ins	Ø ³⁴ Designer	~
8		1.0	Share "Recipe fornies \$.docx"	¢	×	•	5		
			& Add a name, group, or email	0.					
		Recipe Serves: 12	Add a message						
		Ingredie	Anyone with the link can edit.	link 🕞 Send					
		 1 ct. 2 cup 4 larg 1 teas 1 cup 1/2 cu 1/4 to 	s (400g) granulated sugar e eggs poon vanilla extract (125g) all-purpose flour (?) up (45g) unsweetened cocoa powder	•					

being extended to mobile applications. Recipients are now able to open and view the contents of shared files in Excel, PowerPoint and Word on iPhone and iPad devices without signing in. To make edits or leave comments, they will still need to sign in with a Microsoft account.

This means that you can now confidently share documents, worksheets and presentations from your personal Microsoft account and make them available for review with others while giving recipients a way to open and view the content on their mobile devices.







• To share the link with others, type their email address in the Share dialog box, and then click the Send button or else click the 'Copy link' button and paste it in a message created using an app such as Microsoft Outlook or Microsoft Teams.

It should be noted that choosing the 'Anyone with the link can view' setting will allow users to view the content of the file but not edit, even if they are signed in. When recipients open the link you shared with them, they'll be able to open and view the file even if they're not signed into the app.



File recipients, running Version 2.94 (Build 25020422) or later, will be able to open files anonymously using Excel, PowerPoint or Word on their iPhone and iPad devices.

Until next month.

The A to Z of Excel Functions: PHI



Imagine we toss an unbiased coin; half of the time it will come down heads, half tails.



Probability of Heads from One Coin Toss

It is not the most exciting chart we have ever constructed, but it's a start.

If we toss two coins, we get four possibilities: two Heads, a Head and a Tail, a Tail and a Head, and two Tails.



Probability of Heads from Two Coin Tosses

In summary, we should get two heads a quarter of the time, one head half of the time and no heads a quarter of the time. Note that (1/4) + (1/2) + (1/4) = 1. These fractions are the probabilities of the events occurring and the sum of all possible outcomes must always add up to 1.

The story is similar if we consider 16 coin tosses say:

Probability of Heads from 16 Coin Tosses



Again, if you were to add up all of the individual probabilities, they would total to 1. Notice that in symmetrical distributions (such as this one) it is common for the most likely event (here, eight heads) to be the event at the midpoint.

Of course, why should we stop at 16 coin tosses?



All of these charts represent **probability distributions**, *i.e.* it displays how the probabilities of certain events occurring are distributed. If we can formulate a probability distribution, we can estimate the likelihood of a particular event occurring (*e.g.* probability of precisely 47 heads from 100 coin tosses is 0.0666, probability of less than or equal to 25 heads occurring in 100 coin tosses is 2.82×10^{-7}).

Now, we would you to verify this last chart. Assuming you can toss 100 coins, count the number of heads and record the outcome at one coin toss per second, it shouldn't take you more than 4.0 X 10^{22} *centuries* to generate every permutation. Even if we were to simulate this experiment using a computer programme capable of generating many

Probability Distributions

If I plotted charts for 1,000 or 10,000 coin tosses similar to the above, we would generate similarly shaped distributions. This classic distribution which only allows for two outcomes is known as the **Binomial distribution** and is regularly used in probabilistic analysis.

The 100 coin toss chart shows that the average (or '**expected**' or '**mean**') number of heads here is 50. This can be calculated using a weighted

calculations a second it would not be possible. For example, in February 2012, the *Japan Times* announced a new computer that could compute 10,000,000,000,000,000 calculations per second. If we could use this computer, it would only take us a mere 401,969 years to perform this computation. Sorry, but we can't afford the electricity bill.

Let's put this all into perspective. All we are talking about here is considering 100 coin tosses. If only business were that *simple*. Potential outcomes for a business would be much more complex. Clearly, if we want to consider all possible outcomes, we can only do this using some sampling technique based on understanding the underlying probability distributions.

average in the usual way. The 'spread' of heads is clearly quite narrow (tapering off very sharply at less than 40 heads or greater than 60). This spread is measured by statisticians using a measure called **standard deviation** which is defined as the square root of the average value of the square of the difference between each possible outcome and the mean, *i.e.*

$$\sigma = \sqrt{\frac{1}{N} \sum_{i=1}^{N} (x_i - \mu)^2}$$

where: σ = standard deviation

- N = total number of possible outcomes
- Σ = summation
- \mathbf{x}_{i} = each outcome event (from first \mathbf{x}_{1} to last \mathbf{x}_{N})
- **μ** = mean or average

The Binomial distribution is not the most common distribution used in probability analysis: that honour belongs to the Gaussian or Normal distribution:



The Central Limit Theorem states that the sampling distribution of the sample means approaches a normal distribution as the sample size gets larger — no matter what the shape of the population distribution. This is why this distribution is so important in probability and statistics.

Generated by a complex mathematical formula, this distribution is defined by specifying the **mean** and **standard deviation** (see above). The Normal distribution's population is spread as follow:



i.e. 68% of the population is within one standard deviation of the mean, 95% within two standard deviations and 99.7% within three standard deviations.

The formula for the Normal distribution is given by

$$p(x) = \frac{1}{\sigma\sqrt{2\pi}} \exp\left(-\frac{(x-\mu)^2}{2\sigma^2}\right)$$

Fascinating, I know. There is a special version of this called the **standard Normal distribution** (or the **z-distribution**) which is the Normal distribution with mean zero [0] and standard deviation one [1]. Furthermore, probability density functions are a statistical measure used to gauge the likely outcome of a discrete value (*e.g.* the price of a stock).

The PHI function in Excel returns the value of this density function for a standard Normal distribution. It has the following syntax:

=PHI(x)

It has just one argument:

• x: this is required and represents the number for which you want the probability density of the standard Normal distribution.

It should be further noted that:

- if **x** is a numerical value that is not valid, **PHI** returns the #NUM! error value
- if x is using a data type that is not valid, such as a nonnumeric value, PHI returns the #VALUE! error
- this function originated in Excel 2013 and is not backwards compatible with earlier versions of Excel.

Please see our example below:

	А	В	С
1	Formula	Description	Result
2	=PHI(0.5)	The value of the density function for a standard Normal distribution	0.3521

The A to Z of Excel Functions: PHONETIC

CHARACTER	MORSE CODE	TELEPHONY	PHONIC (PRONUNCIATION)
А	• -	Alfa	(AL-FAH)
В	- • • •	Bravo	(BRAH-VOH)
С	-•-•	Charlie	(CHAR-LEE) or (SHAR-LEE)
D	-••	Delta	(DELL-TAH)
Е	•	Echo	(ECK-OH)
F	••-•	Foxtrot	(FOKS-TROT)
G	•	Golf	(GOLF)
Н	••••	Hotel	(HOH-TEL)
Ι	••	India	(IN-DEE-AH)
J	•	Juliett	(JEW-LEE-ETT)
К	-•-	Kilo	(KEY-LOH)
L	•-••	Lima	(LEE-MAH)
М		Mike	(MIKE)
N	-•	November	(NO-VEM-BER)
0		Oscar	(OSS-CAH)
Р	• •	Рара	(PAH-PAH)
Q	•-	Quebec	(KEH-BECK)
R	• - •	Romeo	(ROW-ME-OH)
S	•••	Sierra	(SEE-AIR-RAH)
Т	-	Tango	(TANG-GO)
U	••-	Uniform	(YOU-NEE-FORM) or (OO-NEE-FORM)
V	•••-	Victor	(VIK-TAH)
W	•	Whiskey	(WISS-KEY)
Х	-••-	Xray	(ECKS-RAY)
Y	- •	Yankee	(YANG-KEY)
Z	••	Zulu	(ZOO-LOO)
1	•	One	(WUN)
2	• •	Two	(TOO)
3	•••	Three	(TREE)
4	•••-	Four	(FOW-ER)
5	•••••	Five	(FIFE)
6	- • • • •	Six	(SIX)
7	••	Seven	(SEV-EN)
8	•	Eight	(AIT)
9	•	Nine	(NIN-ER)
0		Zero	(ZEE-RO)

Nope, it's nothing to do with that image (and it's not a type of phone energy either). Excel's **PHONETIC** function may be used to extract the phonetic (furigana) characters from a text string containing Japanese

characters. This function is particularly useful for users working with Japanese text, as it helps in understanding the pronunciation of the characters. A basic understanding of Japanese is assumed!

To use the PHONETIC function, your region setting must be one of the Far East languages (Japanese, Chinese and Korean).

The **PHONETIC** function has the following syntax:

=PHONETIC(reference)

It has just one argument:

• reference: this is required and represents a text string or a reference to a single cell or range of cells that contain a furigana text string.

It should be further noted that:

- if the reference is a range of cells, the furigana text string in the upper-left corner cell of the range is returned
- if the **reference** is a range of nonadjacent cells, the *#N/A* error value is returned.

Please see our examples below:

Text	Result of PHONETIC
さしすせそ	サシスセソ
東京都	トウキョウト
大阪府	オオサカフ

The A to Z of Excel Functions: PI



The number π is a mathematical constant that is the ratio of a circle's circumference to its diameter, approximately equal to 3.14159. The number π appears in many formulae across mathematics and physics. It is an irrational number, meaning that it cannot be expressed exactly as a ratio of two integers, although fractions such as 22/7 are commonly used to approximate it. Consequently, its decimal representation never ends, nor enters a permanently repeating pattern. It is also a transcendental

number, meaning that it cannot be a solution of an equation involving only sums, products, powers and integers. The transcendence of π implies that it is impossible to solve the ancient challenge of squaring the circle with a compass and straightedge. The decimal digits of π appear to be randomly distributed, but no proof of this conjecture has ever been found. But you can find it in Excel.

The **PI** function returns the number 3.14159265358979, the mathematical constant π , accurate to 15 digits. It has the following syntax:

=PI()

It has no arguments but requires the parentheses to distinguish at as an Excel function.

It should be further noted that:

• we have nothing else to say about it.

Please see our final examples for this month below:

	А	В	С
1	Formula	Description	Result
2	=PI()	Returns π	3.1416
3	=2 * PI() * 5	Circumference of a circle with radius 5 (2πr)	31.4159
4	=PI() * 5 ^ 2	Area of a circle with radius 5 (πr^2)	78.5398
-			

More Excel Functions next month.

Beat the Boredom Suggested Solution

The challenge this month was to transform data into a useful Table. Did you succeed?

The Challenge

This month, we had a Power Query challenge. We received some expense information in an Excel workbook which is not in a format that is compatible with our usual layout.

My Expenses for Last Week

Date	22 Mar	ch 2023		
Petrol	Lunch	Hotel	Din	ner
	25	15	100	50

Therefore, this month's challenge was to extract the data from a sheet in the supplied Excel workbook and present it in a Table that can be appended to other expense data. The result should look like the Table below:

Suggested Solution

Expense	Ŧ	Amount	•	Date	Ŧ
Petrol			25	22/03/20	23
Lunch			15	22/03/20	23
Hotel		1	00	22/03/20	23
Dinner			50	22/03/20	23
Treats			10	22/03/20	23

Note: Our dates are in UK format – this was not part of the challenge!

As always, there were some conditions:

- this was a Power Query challenge: no Excel formulae allowed
- the solution should allow us to add more expenses
- the solution should need less than 10 steps (one transformation per step)
- All the steps can be achieved using the User Interface (UI) from one query. No M code was needed.

Suggested Solution

We start by extracting the data. We can select the data and right-click to 'Get Data from Table/Range'. This will also convert our data into a Table:

	A B C D	E	F	G	Aria	9 ~ A" A	· 🗠 - %
1	Transform Dates	5			В	I ≡ <u>◇</u> ~ <u>A</u> ~	⊞ ~ 58 →
2	SP Transform Dates	- Suggeste	ed Solutio	on.xlsx			
3	Navigator	00			Se	earch the menus	
4		Error Checks:			X	Cut	
8	Expenses				Da	Conv) I
9					1	Coby	
10	My Expenses for L	ast Week			C0	Paste Options:	
11						194	
12	Date	22 March 20	23			LU	
13	Petrol	Lunch	Hotel	Dinner		Paste Special	
15	2	5	15	100	0	Count Lookus	
16					- ~	Smart Lookup	
17						Insert	
18						Delete	
19						Delete	
20						Clear Contents	
22					* &	Translata	
23					ax	Translate	
24					25	Quick Analysis	
25						Filter	>
26						rint <u>e</u> r	<i>.</i>
27						Sort	>
28					=	Get Data from Table/	Range
30						Set o ata from rabie/1	ungen
31					Þ	New Comment	
32					17	New Note	
33							

This gives us a query, which we rename to Expenses:

>	 √ f_x = Table.Tr 	ransformColumnTypes(Sourc	e,{{"Column1", type any}	<pre>{"Column2", type any},</pre>	{"Column3", type any}, 🗸 🗸	Query Settings ×
,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	ABC 123 Column1	ABC 123 Column2	ABC Column3	ABC Column4		
1	My Expenses for Last Week	null	null	null		Name
2	null	null	null	null		Evenerar
3	Date	22/03/2023 00:00:00	null	null		Lybenses
4	null	null	null	null		All Properties
5	Petrol	Lunch	Hotel	Dinner		A APPLIED STEPS
6	25	15	100	50		
						Source

The 'Changed Type' step has not achieved anything as our data is currently mixed in the columns. We can remove this step. We have two tasks. We need to extract the date, and we need to format the expenses. We start by extracting the date: we right-click on the cell containing the date:

X	<pre>/ fx = Excel.CurrentWorkbook(){[Name="Table1"]}[Content]</pre>									
	ABC Column1	ABC 123 Column2		ABC 123 Column3	¥	ABC Column4	ABC 123 column 5			
1	My Expenses for Last Week		nu	1	null	null	null			
2	null		nu	1	null	null	null			
3	Date	22/03,	Сору		null	null	null			
4	null		Eiltore		null	null	null			
5	Petrol	Lunch	I mers		-	Dinner	Treats			
6	25		Drill D	own	100	50	10			
			Add as	New Query						

We choose 'Add as New Query' which creates a query called Column2 with only two [2] steps:

File Home Transform Add Column View	Transform	^
To Date Time Table To Transform		
Queries [2] The Expenses Column2	S > Source(2)[Column2] > 22/03/2023 00:00:00 > >	Query Settings × PROPERTES Name Column2 All Properties PAPLED STEPS Source X Navigation

We didn't say we couldn't create another query, only that all the steps had to be created *from* one query! [*Cheat, cheat – Ed.*] In the **Expenses** query, we choose 'Keep Rows' and then 'Keep Bottom Rows' from the Home tab.

File Home Transform Add Colu	lumn View									
Close & Refresh Manage ~ Choc	Nose Remove mns * Columns *	Remove Rows *	Split Group 1, 22	ta Type: Any ~ Use First Row as Headers ~ Replace Values	Merge Queries ~ Append Queries ~ Combine Files	Manage Parameters T	Data source settings	Recent Source	€ ces ₹	
Close Query Man	nage Columns Reduc	e Rows Sort	Ti	ansform	Combine	Parameters	Data Sources	New Query		
Queries [2]	<	$\times \checkmark$	fx = Excel.Cu	rrentWorkbook(){[Name="]	[able1"]}[Content]				
L Expenses		ABC Colum	nn1 💌	ABC Column2	ABC Column3	▼ AB 12	Column4	▼ A 1	23 column 5	*
E Column2		1 My Expen	ses for Last Week	nul	I	null		null		null
		2	null	nul	1	null		null		null
		3 Date		22/03/2023 00:00:00		null		null		null
		4	null	nul	1	null		null		null
		5 Petrol		Lunch	Hotel	Di	nner	Т	reats	
		0	Keep Bottom Specify how many Number of rows 2	n Rows rows to keep.				OK	Cancel	10

We choose to keep two [2] rows. This leaves us with the expense data:

\times	√ fx	= Table.La	astN(Source, 2)				~	Query Settings ×
	ABC 123 Column1	٣	123 Column2	-	ABC Column3	ABC Column4		
1	Petrol	25	Lunch	15	Hotel	Dinner		Name
2		23		15	100	50		Expenses
								All Properties
								APPLIED STEPS
								Source
								🛪 Kept Last Rows 🌼

We choose 'Use first row as headers' from the Home tab:

File	Home	Transform A	dd Column	View								
Close & Load • Close	Refresh Preview *	Properties Advanced Editor Manage Query	Choose Columns • Manage	Remove Columns * Columns	Keep Rows • Reduc	Remo Row Ce Row	× 2↓ Z↓ Z↓ A↓ Pror into	Split Column •	Gr U rst row of thi aders.	ta Type: Any *] Use First Row as Headers [see First Row as Headers [see Lineaders] as First Row s table [sec Lineaders] ce, 2)		Merge Queries - Append Queries Combine Files Combine
EX EX	penses						ABC Colur	nn1	Ŧ	ABC 123 Column2		ABC 123 Column3
⊞© Co	olumn2					1	Petrol			Lunch		Hotel
						2			25		15	

This generates a 'Changed Type' step, which we delete as we are about to select all the data and 'Unpivot Columns' from the Transform tab:

File Home Transform Add Column View						~ 🕜
Croup Use First Row } Count Rows	Columns • Split Column • Column •	Statistics Standard Scientific	Date Time Duration	Expand Aggregate Extract Values		
Table unselected columns into attribute-value pairs.	umns Text Column	Number Column	Date & Time Column	Structured Column		
Queries [2]	= Table.PromoteHeaders(#"Kept Last Ro	ws", [PromoteAllScalars=true])		~	Ouerv Settings	×
Expenses	▼ ABC 123 Lunch ▼ 121	Hotel ABC Dinner	▼ ABC Treats	¥		
E Column2	25 15	100	50	10	 PROPERTIES Name 	
					Expenses	
					All Properties	
					APPLIED STEPS	
					Source	
					Kept Last Rows	4
					× Promoted Headers	4

Now, we can add the date by using 'Custom Column' from the 'Add Column' tab:

File	Refresh Preview *	Properties	Choose Columns * Manage	Remove Columns ~	Keep Rows	Rem Row ce Rov	ove s *	ğ↓ K↓ ort	Split Column By	Data Type: Text " Use First Row as Headers " 1 ₉₋₂ Replace Values Transform	Merge Queries - Append Queries - Combine Files Combine	Manage Parameters * Parameters	Data source settings Data Sources	New Source *	
Queries [2]				<	X	~	/	fx = Tabl	e.AddColumn(#"Unpivoted (Columns", "Date", e	ach Column2)		
🛄 Exp	penses					-	AB_ A	ttrib	uto	ABC Value	ABC Date				
Co	lumn2						A-C A	ttrib	ute	123 Value	123 Date				
						1	Petre'								X
						2	Lunc		Custom (olumn					
						3	Hote		Custom	Juli					
						4	Trop		Add a column	that is computed from the	other columns.				
						5	filea		New column na	ame					
									Date						
									Custom columi	n formula 🕡			Available colu	imns	
									- Co				Attribute		
									(@) Colu Comb Comb Comb Comb Comp Comp Comp Comp Comp Comp Comp Comp Comp Comp Comb	mnz iner.CombineTextByDelimi iner.CombineTextByLachDe iner.CombineTextByLachDe iner.CombineTextByPositi iner.CombineTextByPAnges onDataService.Database arer.FomGulture arer.OrdinalIgnoreCase ression.Brotli	ter limiter s ons		Ue	<< Insert	
									✓ No syntax	errors have been detected.			[OK Cancel	

We choose the **Column2** query and create the new column **Date**.

1 Petrol 25 22/03/2023 00:00:00 Name 2 Lunch 15 22/03/2023 00:00:00 Expenses 3 Hotel 100 22/03/2023 00:00:00 All Properties 4 Dinner 50 22/03/2023 00:00:00 Source Kept Last Rows Promoted Headers Promoted Headers	Petrol 22/03/2023 00:00:00 Name Lunch 15 22/03/2023 00:00:00 Expenses Hotel 100 22/03/2023 00:00:00 All Properties Dinner 50 22/03/2023 00:00:00 Source Kept Last Rows Formoted Headers Unpivoted Columns Very Very Very Very Very Very Very Very	×	√ f _x = Table.A A ^B _C Attribute	ddColumn(#"Unpivoted Colu ABC 123 Value	mns", "Date", each Date) ABC 123 Date
2 Lunch 15 22/03/2023 00:00:00 Expenses 3 Hotel 100 22/03/2023 00:00:00 All Properties 4 Dinner 50 22/03/2023 00:00:00 All Properties Source Kept Last Rows Promoted Headers	1 15 22/03/2023 00:00:00 Expenses I Hotel 100 22/03/2023 00:00:00 Dinner 50 22/03/2023 00:00:00 All Properties Source Kept Last Rows Promoted Headers Unpivoted Columns	1	Petrol	25	22/03/2023 00:00:00
a Hotel 100 22/03/2023 00:00:00 4 Dinner 50 22/03/2023 00:00:00 All Properties Source Kept Last Rows Promoted Headers	I Hotel 100 22/03/2023 00:00:00 Dinner 50 22/03/2023 00:00:00	2	Lunch	15	22/03/2023 00:00:00
All Properties All Pr	i Dinner 50 22/03/2023 00:00:00 All Properties APPLIED STEPS Source Kept Last Rows Promoted Headers Unpivoted Columns	3	Hotel	100	22/03/2023 00:00:00
APPLIED STEPS Source Kept Last Rows Promoted Headers	 APPLIED STEPS Source Kept Last Rows Promoted Headers Unpivoted Columns 	4	Dinner	50	22/03/2023 00:00:00
Source Kept Last Rows Promoted Headers	Source Kept Last Rows Promoted Headers Unpivoted Columns				
Kept Last Rows Promoted Headers	Kept Last Rows Promoted Headers Unpivoted Columns				
Promoted Headers	Promoted Headers Unpivoted Columns				
	Unpivoted Columns				

Now we just need to tidy up. We rename the columns and assign the correct data types:

File Home Transform	Add Column View							~ 🕜
Group Use First Row By as Headers + 10 Count Rows	Data Type: Text * 1.2 Replace Va Detect Data Type I Fill * I Rename I root Columnia	alues - 🖏 Unpivot Columns - I Move - mn 🔋 Convert to List	Split Column	XO Trigonometry Statistics Standard Scientific Information	Date Time Duration	Create Data Type		
Table	Any Colu	ımn	Text Column	Number Column	Date & Time Column Structure	d Column		
Queries [2]	· · · · ·	< √ fx = Table	.TransformColumnTypes(#"Rename	ed Columns",{{"Amount", type number	<pre>}, {"Date", type date}})</pre>	~	Query Settings	\times
Column2	1 2 3 4 5	, A [®] _C Expense Petrol Lunch Hotel Dinner Treats	 1.2 Amount 15 15 100 50 10 	Date • 22/03/2023 22/03/2023 22/03/2023 22/03/2023 22/03/2023 22/03/2023			PROPERTIES Name Expenses All Properties APPLIED STEPS Source Kept Last Rows Promoted Headers Unpivoted Columns Addied for	0 0
							Renamed Columns	ri

We have our solution in nine [9] steps!

We choose 'Close & Load To...' from the Home tab so that we can put **Expenses** on the same sheet as the data, and keep **Column2** as a 'Connection Only' query:

	A B C D	E	F	G	Н	I J	К	L		
1	Transform Dates									
2	SP Transform Dates	- Suggested	Solution.x	sx						
3	Navigator									
4		Error Checks:								
8	Expenses					Suggested	Solutio	n		
9	· · · · · · · · · · · · · · · · · · ·									
10	Column1 💽	Column2 🗾	Column3 🛛	Column4	*	Expense 💌	Amount	Date	-	
11	My Expenses for Las	st Week				Petrol	2	5 22/03/202	23	
12						Lunch	1	5 22/03/202	23	
13	Date	22 March 2023				Hotel	10	0 22/03/202	23	
14						Dinner	5	0 22/03/202	23	
15	Petrol	Lunch	Hotel	Dinner						
16	25	15	100)	50 <mark>.</mark>					
17										

Finally, we show that more expenses can be added:

1	A B C D	tes E	F	G	Н	l J	K L	M N		Queries & Connections	~ ×
2	SP Transform Da	tes - Sugge	sted Solution	on.xlsx					- 1	Queries Connections	
4	Expenses	Error Check	s:			⊠ Suggested	Solution		-1	Expenses	D
9 10	Column1	Column2	Column3	Column4	✓ column ✓	Expense -	Amount 💌 Date 🔍		- 1	5 rows loaded.	
11 12	My Expenses	for Last Week	b 2022			Petrol Lunch	25 22/03/2023 15 22/03/2023		- 1	Connection only.	
14	Petrol	Lunch	Hotel	Dinner	Treats	Dinner Treats	50 22/03/2023 50 22/03/2023 10 22/03/2023				
16 17		25	15	100	50 10						

Did you have a better solution? Let us know, we'd be glad to hear if there are better ways to work around this problem!

Key Strokes

Each newsletter, we'd like to introduce you to useful keystrokes you may or may not be aware of. This time, we thought we would look at some of the keyboard commands on their own:

Keystroke	What it does					
Backspace	Edit and clear					
Delete	Clear					
Down	Move down one cell					
End	Toggle End mode					
ENTER	Enter value and move down (by default)					
ESC(APE)	Cancel (edit, copy, cut, dialog, <i>etc</i> .)					
Execute	Enter value and move down (by default)					
Help	Help					
Home	Select the first cell in the row					
Insert	Toggle Overwrite mode in Edit mode					
Left	Move left one cell					
Page Down	Page down					
Page Up	Page up					
RETURN	Enter value and move down (by default)					
Right	Move right one cell					
Subtract (-)	Extend Selection mode					
ТАВ	Tab forwards (next cell to edit)					
Up	Move up one cell					

There are *c*.550 keyboard shortcuts in Excel. For a comprehensive list, please download our Excel file at http://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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- 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".

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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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