

Sum Product

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In this month's issue

the Surface resurfaces, but how much will it OFFSET you? Yes, we continue our series on some of the more common functions you really must know to get the most out of Excel. With F12 detailed in our regular Keyboard Shortcuts feature and Strategic Planning, Budgeting and Forecasting under the microscope in our focus on training, we hope you find our latest newsletter relevant.

See you next month.

Liam Bastick, Managing Director, SumProduct



Resurfacing Surface



Last month we discussed how Excel works on the iPad so it seems only fair to discuss the recent issue of the new(ish) Surface 3.

Launched in the United States June, the past two months have seen the latest hybrid laptop / tablet become available in a further 25 markets. However, you might have had difficulty in procuring one with some retailers (e.g. Australian) reporting scorched surfaces (well a sell out at least but we couldn't resist the pun) by lunchtime on launch date.

Therefore, you might be interested to learn that Microsoft has announced stock replenishment is its "top priority" and that they should be available in existing markets within "...the next week or two...".

Decisions, decisions: Surface 3 v iPhone 6? It sounds like a football score...

Function Review: OFFSET

Last month we talked about INDEX and MATCH, functions concerned with position; this month we look at OFFSET, a function which considers displacement.

The syntax for OFFSET is as follows:

OFFSET(Reference,Rows,Columns,[Height],[Width]).

The arguments in square brackets (Height and Width) can be omitted from the formula (they both have a default value of 1 which is explained further below).

In its most basic form, **OFFSET(Ref,x,y)** will select a reference **x** rows down (-x would be **x** rows up) and **y** rows to the right (-y would be **y** rows to the left) of the reference **Ref**. For example, consider the following grid:

	A	B	C	D	E	F
1	1	2	3	4	5	6
2	7	8	9	10	11	12
3	13	14	15	16	17	18
4	19	20	21	22	23	24
5	25	26	27	28	29	30
6	31	32	33	34	35	36

OFFSET(A1,2,3) would take us two rows down and three columns across to cell D3. Therefore, **OFFSET(A1,2,3) = 16**, viz.

Figure 2: OFFSET(A1,2,3)

	A	B	C	D	E	F
1	1	2	3	4	5	6
2	7	8	9	10	11	12
3	13	14	15	16	17	18
4	19	20	21	22	23	24
5	25	26	27	28	29	30
6	31	32	33	34	35	36

OFFSET(D4,-1,-2) would take us one row up and two rows to the left to cell B3. Therefore, **OFFSET(D4,-1,-2) = 14**, viz.

Figure 3: OFFSET(D4,-1,-2)

	A	B	C	D	E	F
1	1	2	3	4	5	6
2	7	8	9	10	11	12
3	13	14	15	16	17	18
4	19	20	21	22	23	24
5	25	26	27	28	29	30
6	31	32	33	34	35	36

We can use these mechanics to answer this month's query and construct a very simple scenario table:

Scenario Illustration										
OFFSET Examples										
Go to Table of Contents										
← → ☒										
Scenario Illustration										
Key Data For Model										
Scenario Selected: 1										
Assumption Description	Amts Used	1	2	3	4	5				
Base Year Unit Price	\$3.70	\$3.70	\$4.15	\$3.00	\$2.85	\$2.99				
Unit Price Growth Rate	2.0%	2.0%	3.0%	4.0%	5.0%	6.0%				
Base Year Volume	80,000.0	80,000.0	85,000.0	82,500.0	77,900.0	83,000.0				
Volume Increase p.a.	200.0	200.0	250.0	300.0	200.0	150.0				
Unit Cost Price	\$1.00	\$1.00	\$1.30	\$1.10	\$1.25	\$1.29				
Unit Cost Growth Rate	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%				
Tax Rate	28.0%	28.0%	30.0%	30.0%	28.0%	33.0%				

Essentially, the assumptions used in the model are linked from cells J14:J20 (in yellow). These values are drawn from the scenario table to the right of the highlighted yellow range (e.g. cells L14:L20 constitute Scenario 1, cells M14:M20 constitute Scenario 2).

The Scenario Selector is located in cell J11. Using OFFSET we can retain all scenarios and select as we see fit. For example, the formula in cell J14 is simply **OFFSET(K14,, \$J\$11)**, that is, start at cell K14 and displace zero

rows and the value in J11 columns across. In the illustration above, the formula locates the cell one column to the right, which is Scenario 1.

The advantage of OFFSET over other functions such as INDEX, CHOOSE and LOOKUP functions is that the range of data can be added to. Whilst the other functions require a specified range whereas we can keep adding scenarios without changing the formula / making the model inefficient.

Other Uses

OFFSET can be used for other practical uses in Excel, taking advantage of the Height and Width arguments.

Consider our OFFSET example from earlier. If we extend the formula to **OFFSET(D4,-1,-2,-2,3)**, it would again take us to cell B3 but then we would select a range based on the Height and Width parameters.

The Height would be two rows going up the sheet, with row 14 as the base (i.e. rows 13 and 14), and the Width would be three columns going from left to right, with column B as the base (i.e. columns B,C and D).

Hence **OFFSET(D4,-1,-2,-2,3)** would select the range B2:D3, viz.

	A	B	C	D	E	F
1	1	2	3	4	5	6
2	7	8	9	10	11	12
3	13	14	15	16	17	18
4	19	20	21	22	23	24
5	25	26	27	28	29	30
6	31	32	33	34	35	36

Note that **OFFSET(D4,-1,-2,-2,3) = #VALUE!** since Excel cannot display a matrix in one cell, but it does recognise it. However, if after typing in **OFFSET(D4,-1,-2,-2,3)** we press **CTRL + SHIFT + ENTER**, we turn the formula into an array formula: **{OFFSET(D4,-1,-2,-2,3)}** (do not type the braces in, they will appear automatically as part of the Excel syntax). This gives a value of 8, which is the value in the top left hand corner of the matrix, *but Excel is storing more than that*. This can be seen as follows:

- **SUM(OFFSET(D4,-1,-2,-2,3)) = 72** (i.e. **SUM(B2:D3)**)
- **AVERAGE(OFFSET(D4,-1,-2,-2,3)) = 12** (i.e. **AVERAGE(B2:D3)**).

Indeed, we can construct a simple depreciation calculation, transpose references or even build a dynamic chart (one that displays more / less categories of information as required) using OFFSET's Height and Width

functionalities. The attached workbook provides several examples as illustrations.

While OFFSET is an extremely useful and flexible function, it is not transparent. The syntax is not only difficult for the user to grasp, Excel's auditing tools have problems too. The Reference cell in the OFFSET arguments is the sole component that will be identified, e.g. **OFFSET(A1,2,3)** will trace cell A1 only.

Furthermore, as stated above, spreadsheet users do get confused – in particular, regarding the Reference. When calculating the Rows and Columns components, the Reference cell is excluded, but it is included in determining the Height and Width.

Key Strokes

Each newsletter, we'd like to introduce you to several useful keystrokes you may or may not be aware of. This month we consider thought we'd continue our recent preoccupation with function keys and look at one that dozen get used often: F12...

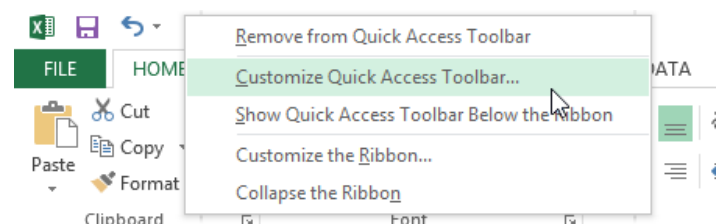
Keystroke	What it does
F12	Save As
SHIFT + F12	Save
CTRL + F12	Open
CTRL + SHIFT + F12	Print

There are over 540 keyboard shortcuts in Excel. For a comprehensive list, please download our Excel file at <http://www.sumproduct.com/thought/keyboard-shortcuts>.

Paying CLOSE Attention in Excel 2013

Ever closed that final file in Excel 2013 only for the application to close down as well? This is the Excel 2013 way of the world but there is a workaround and we thank Wyn Hopkins of Access Analytic for bringing this to our attention.

In Excel 2013, simply right-click on the Quick Access Toolbar and select 'Customize Quick Access Toolbar...' viz.



Training Update: Strategic Planning, Forecasting and Budgeting



How often have you looked back with the benefit of hindsight and wished you knew then what you know now? How do you compare what actually happened with what you thought would happen?

Aimed at all finance professionals involved in the budgeting and forecasting process, this session discusses how you can reduce the risks in your forward-looking decision-making using budgets and financial models, by utilising our kit bag of qualitative and quantitative tips, tools and techniques.

This practical course provides an introduction to the analysis that can be built into forecasting and budgeting developed in spreadsheets. Using simple statistical tools and an overview of some of Excel's little-known functions and functionalities, this course will provide attendees with a pragmatic approach to enhance the efficiency and effectiveness of their forecasting.

And the course is getting increasingly popular: we're scheduling it in Dubai, Hong Kong, London, New York and Singapore in the forthcoming months.

If you are interested but unsure what course is for you and / or your team, drop us a line at training@sumproduct.com and we will send you out our new, no-obligation self-survey that should point you in the right direction.

Upcoming SumProduct Training Courses

Kuala Lumpur 13th - 17th Oct 2014: Accounting, Finance & Decision-Making

Sydney 21st Oct 2014: Excel Update

Sydney 22nd Oct 2014: Excel Tips & Tricks

Sydney 22nd Oct 2014: Tabling Tables

Singapore 18th - 21st Nov 2014: Strategic Planning, Forecasting and Budgeting

Melbourne 1st - 2nd Dec 2014: Power Pivot training

Sydney 3rd - 4th Dec 2014: Power Pivot training

Brisbane 8th - 9th Dec 2014: Power Pivot training

Perth 10th-11th Dec 2014: Power Pivot training

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- M&A work
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- 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.

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

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