

Excel Challenge No 3: Numbers to Words

Level: Expert Skills

Mike Smart

Excel Challenge No 3: Numbers to Words

Published by:

The Smart Method® Ltd
Burleigh Manor
Peel Road
Douglas, IOM
Great Britain
IM1 5EP

Tel: +44 (0)845 458 3282 Fax: +44 (0)845 458 3281

E-mail: Use the contact page at <https://thesmartmethod.com/contact/>

Web: <http://TheSmartMethod.com> (this book's web site)

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2 4 6 8 10 9 7 5 3 1

Challenge overview

Over the years, we have received thousands of Excel questions from our customers. Most can be solved quite easily, but occasionally we're asked a question that is a real challenge to answer. The question that we were asked was:

How can I convert a number like 1,025 into text like "One thousand and twenty five"?

Excel doesn't offer a simple way to achieve this, but if your Excel skills are truly expert-level it should be possible for you to figure out how to do this.

The final result will look like this:

	A	B	C	D
1				
2		Enter a Number:	13134	
3				
4		Here it is as text:		
5			Thirteen Thousand One Hundred Thirty Four	
6				
7				

The challenge is to create a workbook that will convert any number up to **99,999** into text. Whichever number is entered in cell C2 should be shown as text in cell C5.

You can complete this challenge using nothing but Excel's built-in formulas and functions. You do not need to use any VBA code or macros. All of the skills needed to complete this challenge are covered in our *Expert Skills* course.

Estimated time to complete this challenge: 3 minutes, 30 seconds

The solution video shows this task being completed in the estimated time shown above.

It is interesting to compare the time a trained Excel user can complete a simple task when compared to an untrained user. An untrained user could spend many hours figuring out how to complete this task (if they were able to complete it at all) and would probably attempt it in an unnecessarily complex way.

No VBA program code or Macros are used in this challenge.



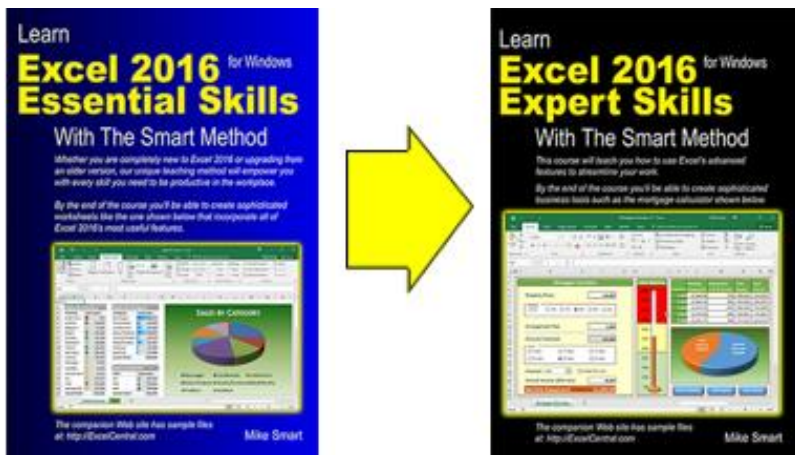
The use of VBA programming code or recorded macros (recorded macros also contain VBA program code) is always a virus threat. For this reason, most corporate environments have a security policy that does not allow VBA program code within Excel workbooks. When using Excel for its intended purpose it is actually very rare find a true need for custom VBA program code. No VBA program code, recorded macros or add-ins are used in this challenge.

You can use this challenge in two ways

As an *Excel Expert Skills* Trained User

This challenge is graded: *Expert Skills*

This means that if you've completed the *Essential Skills* tutorial and the *Advanced Functions* session in the *Expert Skills* tutorial you should have the skills you need to complete this challenge.



The *Essential Skills* book/e-book is designed for learners who have never used Excel before and who need Excel skills to get a job. The course is designed to give students all the skills an employer would expect. After completing the *Essential Skills* course students will have acquired Excel skills that are better than those of most office workers.

Some of the functions needed to complete this challenge are not explicitly covered in the *Essential Skills* course but are in the *Advanced Functions* session in the *Expert Skills* course.

While the books/e-books teach all the techniques needed to complete this challenge it is possible that students may lack the experience needed to identify the best approach to completing this challenge.

The *Essential* and *Expert Skills* books already include an exercise with answers at the end of each session.

Our Excel challenges take things to the next level and are far more involved than the exercises presented in the books. Challenges are designed to allow users to test their ability to apply some of the Excel skills taught in the books/e-books.

As an Excel user wishing to test their existing skills

If you are self-taught or have acquired your Excel skills from a classroom course, or by other means, you may well have the skills needed to complete this challenge.

Completing the challenge will reassure you that you have excellent Excel skills. You can see a list of all the skills that are taught in the *Essential Skills* and *Expert Skills* books in: *Appendix A: Skills Covered in the Essential Skills Course* and *Appendix B: Skills Covered in the follow-on Expert Skills Course* at the end of this book.

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Support, Feedback and Sample Files

Support

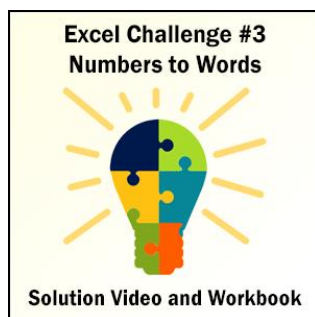
If you encounter any problem downloading the free sample file you can contact us for free support at:

<https://thesmartmethod.com/contact/>

We'll do everything possible to quickly resolve the problem.

The Challenge Solution Video and Workbook

For assistance in completing the challenge you should first refer to the *Challenge Solution Video* and *Solution Video and Workbook* (available from <https://thesmartmethod.com>). If you are still unable to complete the challenge after using these resources, you can contact us for support using the same contact link above and we'll assist in every way we can.



Feedback

At The Smart Method® we love feedback – both positive and negative. If you have any suggestions for improvements to future versions of this challenge, or if you find content or typographical errors, the author would always love to hear from you.

You can make suggestions for improvements to this book using the online form at:

<https://thesmartmethod.com/contact/>

Future editions of this challenge will always incorporate your feedback so that there are never any known errors at time of publication.

If you have any difficulty understanding the challenge, working through the step-by-step challenge solution video tutorial, or if you feel that anything could have been more clearly explained, we'd also love to hear from you. We've made hundreds of detail improvements to our books based upon reader's feedback and continue to chase the impossible goal of 100% perfection.

Downloading the free sample file

Before beginning this challenge you will find it useful to download an Excel workbook that contains the starting point of the challenge. You'll find a free file available for instant download at:

<https://TheSmartMethod.com>

Challenge Description

Challenges are graded at three levels of difficulty: *Basic Skills*, *Essential Skills* and *Expert Skills*.

If you've completed the *Expert Skills* tutorial you should have the skills you need to complete this challenge.

Challenges

There are six incremental challenges detailed in the following pages:

1. Download the sample file and open it in Excel
2. Add headings and extract the last two digits of the number
3. Extract the hundreds from the number
4. Extract the thousands from the number
5. Complete the calculation and connect it to the user interface

Challenge 1: Download the sample file and open it in Excel

To save you time typing in the data you can download this sample file that has the starting point for the challenge.

You can download the file from <https://TheSmartMethod.com>.

	A	B	C	D
1				
2	Enter a Number:		13134	
3				
4	Here it is as text:			
5				
6				
7				

This workbook contains the interface that the final version will use to convert numbers into their textual equivalent. You are going to add all of the formulas to calculate this yourself.

In the final version, any number (up to 99,999) entered into cell C2 will be displayed as text in cell C5.

The workbook also contains a *Calculation* worksheet that contains a table containing the textual equivalent of all numbers up to 99. You will need this for your formulas, and not to have to type all of the words in manually will speed things up a lot!

	A	B	C
1	Number	Name	
2	0		
3	1	One	
4	2	Two	
5	3	Three	
6	4	Four	
7	5	Five	
8	6	Six	
9	7	Seven	
10	8	Eight	
11	9	Nine	
12	10	Ten	
13	11	Eleven	
14	12	Twelve	
15	13	Thirteen	

Challenge 2: Add headings and extract the last two digits of the number

The challenge is to convert numbers up to 99,999. This sounds like a very difficult problem, but it will be easier if you break it down into simpler steps. If you split the number into tens, hundreds and thousands it will be much simpler to calculate.

Looking at the table of numbers might have already given you a hint as to how the numbers are going to be converted, but it's not as simple as it first seems. It will still be a challenge for almost all Excel users to achieve the result you're looking for.

You're going to carry out all of the calculations on the *Calculation* worksheet, and you're going to need to split the number into three components. Add headings for the **Number**, **Thousands**, **Hundreds** and **Tens**.

Add a formula to extract the number that was entered into the interface into cell D2.

Add formulas to extract the last two digits from the number into cell G2 and return the textual equivalent into cell G3.

	A	B	C	D	E	F	G	H
1	Number	Name		Number	Thousands	Hundreds	Tens	
2		0		13134			34	
3		1 One					Thirty Four	
4		2 Two						

You should now have a worksheet that can convert any number up to 99 into text.

Tasks

1. Add the headings **Number**, **Thousands**, **Hundreds** and **Tens** in cells D1, E1, F1 and G1 of the *Calculation* worksheet.
2. Place a formula into cell D2 that will always display the same number that appears in cell C2 in the *Interface* worksheet.
3. Add a formula to cell G2 that extracts the last two digits from the number that was entered.
4. Add a formula to cell G3 that looks up the last two digits in the *NumberNames* table and displays the equivalent text.

Hint

The numbers in the table are stored as numbers rather than text.

Estimated time: 1 minute

The solution video shows this task being completed in the estimated time shown above.

Challenge 3: Extract the hundreds from the number

You're probably thinking that all you need to do is repeat what you did in the previous challenge, but there are a few complications that make this a slightly more complex task.

Add a formula to cell F2 that extracts the hundreds from the number and add a formula to cell F3 that extracts the textual equivalent.

Remember that your formulas should account for numbers that are less than 100.

	A	B	C	D	E	F	G	H
1	Number	Name		Number	Thousands	Hundreds	Tens	
2	0			13134		1	34	
3	1	One				One Hundred	Thirty Four	
4	2	Two						

You should now be able to convert any number up to 999 into text.

Tasks

1. Add a formula to cell F2 that extracts the *Hundreds* part of the number, taking into account that some numbers may be less than 100.
2. Add a formula to cell F3 that returns the textual equivalent of the number, but only if there are any hundreds to display.

Hint

Although phrases such as "thirteen hundred" are sometimes used instead of "one thousand three hundred", this system is going to use the "one thousand three hundred" pattern.

Estimated time: 50 seconds

The solution video shows this task being completed in the estimated time shown above.

Challenge 4: Extract the thousands from the number

Once again, this is similar to the previous challenges but with its own complications.

Add a formula to cell E3 that extracts the *Thousands* from the number and a formula to cell E4 that returns the textual equivalent.

Your formulas need to account for the possibility of numbers greater than 9999 and numbers less than 1000.

	A	B	C	D	E	F	G	H
1	Number	Name		Number	Thousands	Hundreds	Tens	
2	0			13134	13	1	34	
3	1	One			Thirteen Thousand	One Hundred	Thirty Four	
4	2	Two						

You should now be able to convert numbers up to 99,999 into text, which is the goal of this challenge.

Tasks

1. Add a formula to cell E2 that extracts the *Thousands* part of the number, account for the possibility of numbers less than 1000 or greater than 9999.
2. Add a formula to cell E3 that extracts the textual equivalent of the thousands, but only if there are any thousands to display.

Hint

Test your formulas using numbers less than 1000 or greater than 9999 to confirm whether your formulas are working correctly.

Estimated time: 37 seconds

The solution video shows this task being completed in the estimated time shown above.

Challenge 5: Complete the calculation and connect it to the user interface

All of the difficult work has been done. All that remains is to combine the text into a single sentence and display it in the user interface.

Add a formula to cell H3 that combines the contents of cells E3:G3 into a single sentence.

C	D	E	F	G	H	I
	Number	Thousands	Hundreds	Tens		
	13134	13	1	34		
		Thirteen Thousand	One Hundred	Thirty Four	Thirteen Thousand One Hundred Thirty Four	

Add a formula to cell B5 of the *Interface* worksheet to display the final sentence in the interface.

	A	B	C	D
1				
2		Enter a Number:	13134	
3				
4		Here it is as text:		
5		Thirteen Thousand One Hundred Thirty Four		
6				
7				

Tasks

1. Add a formula to cell H3 that combines the contents of cells E3:G3 into a single sentence.
2. Add a formula to cell B5 of the *Interface* worksheet to display the final sentence in the interface.

Hint

Test your finished workbook thoroughly to make sure that all of your formulas are working correctly. Try using the following numbers:

1 – Should return *One*.

113 – Should return *One Hundred Thirteen*.

4308 – Should return *Four Thousand Three Hundred Eight*

77235 – Should return *Seventy Seven Thousand Two Hundred Thirty Five*.

Estimated time: 30 seconds

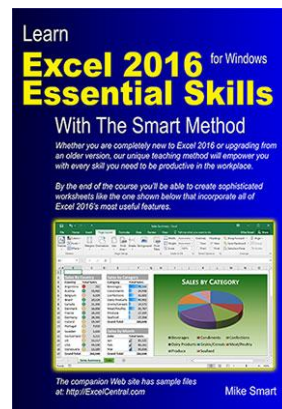
The solution video shows this task being completed in the estimated time shown above.

A

Appendix A: Skills Covered in the Essential Skills Course

Our Excel Challenges are graded *Basic Skills*, *Essential Skills* and *Expert Skills*.

This is an Essential Skill challenge, meaning that it should be possible to complete the challenge using only the skills outlined in the Essential Skills book/e-book.



ISBN: 978-1-909253-08-7
(371 pages).

This appendix lists the lessons contained in the eight sessions that make up the *Essential Skills* book.

Learn Excel 2016 Essential Skills with The Smart Method is available as both a low-cost printed paper book (always in stock at Amazon) and as a PDF e-Book (provided in the same unlocked, printable format as this e-Book).

You can only obtain the *Essential Skills* e-Book from the <https://TheSmartMethod.com> web site (this is the publisher's own web site).

Essential skills course outline

Session 1: Basic Skills

- Start Excel and open a new blank workbook
- Check that your Excel version is up to date
- Change the Office Theme
- Maximize, minimize, re-size, move and close the Excel window
- Download the sample files and open/navigate a workbook
- Save a workbook to a local file
- Understand common file formats
- Pin a workbook and understand file organization
- View, move, add, rename, delete and navigate worksheet tabs
- Use the Versions feature to recover an unsaved Draft file
- Use the Versions feature to recover an earlier version of a workbook
- Use the Ribbon
- Understand Ribbon components
- Customize the Quick Access Toolbar and preview the printout
- Use the Mini Toolbar, Key Tips and keyboard shortcuts
- Understand views
- Hide and show the Formula Bar and Ribbon
- Use the Tell Me help system
- Use other help features

Session 2: Doing Useful Work with Excel

- Enter text and numbers into a worksheet
- Create a new workbook and view two workbooks at the same time
- Use AutoSum to quickly calculate totals
- Select a range of cells and understand Smart Tags
- Enter data into a range and copy data across a range
- Select adjacent and non-adjacent rows and columns
- Select non-contiguous cell ranges and view summary information
- AutoSelect a range of cells
- Re-size rows and columns
- Use AutoSum to sum a non-contiguous range
- Use AutoSum to quickly calculate averages
- Create your own formulas

- Create functions using Formula AutoComplete
- Use AutoFill for text and numeric series
- Use AutoFill to adjust formulas
- Use AutoFill Options
- Speed up your AutoFills and create a custom fill series
- Understand linear and exponential series
- Use Flash Fill to split and concatenate text
- Use the zoom control
- Print out a worksheet

Session 3: Taking Your Skills to the Next Level

- Insert and delete rows and columns
- Use AutoComplete and fill data from adjacent cells
- Cut, copy and paste
- Cut, copy and paste using drag and drop
- Use Paste Values
- Increase/decrease decimal places displayed
- Transpose a range
- Use the multiple item clipboard
- Use Undo and Redo
- Insert, View and Print cell comments
- Understand absolute, relative and mixed cell references
- Understand templates and set the default custom template folder
- Create a template
- Use a template
- Add an Office Add-In to a workbook
- Freeze columns and rows
- Split the window into multiple panes
- Check spelling

Session 4: Making Your Worksheets Look Professional

- Format dates
- Understand date serial numbers
- Format numbers using built-in number formats
- Create custom number formats
- Horizontally and Vertically align the contents of cells

- Merge cells, wrap text and expand/collapse the formula bar
- Understand themes
- Use cell styles and change themes
- Add color and gradient effects to cells
- Add borders and lines
- Create your own custom theme
- Create your own custom cell styles
- Use a master style book to merge styles
- Use simple conditional formatting
- Manage multiple conditional formats using the Rules Manager
- Bring data alive with visualizations
- Create a formula driven conditional format
- Insert a Sparkline into a range of cells
- Apply a common vertical axis and formatting to a Sparkline group
- Apply a date axis to a Sparkline group and format a single Sparkline
- Use the Format Painter
- Rotate text

Session 5: Charts and Graphics

- Understand chart types, layouts and styles
- Create a simple chart with two clicks
- Move, re-size, copy and delete a chart
- Create a chart using the Recommended Charts feature
- Add and remove chart elements using Quick Layout
- Apply a pre-defined chart style and color set
- Manually format a chart element
- Format 3-D elements and add drop shadows
- Move, re-size, add, position and delete chart elements
- Apply a chart filter
- Change a chart's source data
- Assign non-contiguous source data to a chart
- Understand data series and categories
- Change source data using the Select Data Source dialog tools
- Chart non-contiguous source data by hiding rows and columns
- Create a chart with numerical axes
- Deal with empty data points
- Add data labels to a chart

- Highlight specific data points with color and annotations
- Add gridlines and scale axes
- Emphasize data by manipulating pie charts
- Create a chart with two vertical axes
- Create a combination chart containing different chart types
- Work with trend lines and forecast sheets
- Add a gradient fill to a chart background
- Create your own chart templates
- Create a filled map chart

Session 6: Working with Multiple Worksheets and Workbooks

- View the same workbook in different windows
- View two windows side by side and perform synchronous scrolling
- Duplicate worksheets within a workbook
- Move and copy worksheets from one workbook to another
- Hide and unhide a worksheet
- Create cross worksheet formulas
- Understand worksheet groups
- Use find and replace

Session 7: Printing Your Work

- Print Preview and change paper orientation
- Use Page Layout view to adjust margins
- Use Page Setup to set margins more precisely and center the worksheet
- Set paper size and scale
- Insert, delete and preview page breaks
- Adjust page breaks using Page Break Preview
- Add auto-headers and auto-footers and set the starting page number
- Add custom headers and footers
- Specify different headers and footers for the first, odd and even pages
- Print only part of a worksheet
- Add row and column data labels and grid lines to printed output
- Print several selected worksheets and change the page order
- Suppress error messages in printouts

Session 8: Cloud Computing

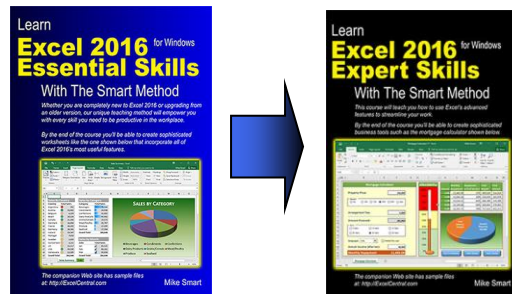
- Understand Cloud Computing
- Save a workbook to a OneDrive
- Open a workbook from a OneDrive
- Understand operating systems and devices
- Understand Office versions
- Understand Excel Online
- Open a workbook using Excel Online
- Share a link to a workbook
- Edit a workbook simultaneously with other users using Excel Online

B

Appendix B: Skills Covered in the follow-on Expert Skills Course

Every Excel user can benefit from the *Essential Skills* book. After completing this course, students have an Excel skill level that would impress any employer. Your Excel skills will be better than most office workers (even those with many years of Excel experience).

Not many Excel users will need to go further than *Essential Skills* in expanding their skill set. Some users may have special requirements, or simply a desire to understand **absolutely every** Excel feature. For such users, we created our *Expert Skills* book that builds upon the skills learned in the *Essential Skills* book.



The *Expert Skills* book teaches advanced Excel skills that are rarely mastered by Excel users.

By the end of the book you'll be a true Excel expert. Your Excel skills will be greater and broader than almost all other Excel users in the workplace.

This appendix lists the lessons contained in the eleven sessions that make up the *Expert Skills* book.

Learn Excel 2016 Expert Skills with The Smart Method is available as both a low-cost printed paper book (always in stock at Amazon) and as a PDF e-Book (provided in the same unlocked, printable format as this e-Book).

You can only obtain the *Expert Skills* e-Book from the <https://TheSmartMethod.com> web site (this is the publisher's own web site: The Smart Method Ltd).

Expert skills course outline

Session 1: Tables, and Ranges

- Understand update channels
- Check that automatic updates are enabled
- Change the Office Theme
- Apply a simple filter to a range
- Apply a top 10 and custom filter to a range
- Apply an advanced filter with multiple OR criteria
- Apply an advanced filter with complex criteria
- Apply an advanced filter with function-driven criteria
- Extract unique records using an advanced filter
- Add totals using Quick Analysis
- Add percentage and running totals using Quick Analysis
- Convert a range into a table and add a total row
- Format a table using table styles and convert a table into a range
- Create a custom table style
- Sort a range or table by rows
- Sort a range by columns
- Sort a range or table by custom list
- Name a table and create an automatic structured table reference
- Create a manual structured table reference
- Use special items in structured table references
- Understand unqualified structured table references

Session 2: Data Integrity, Subtotals and Validations

- Split fixed width data using Text to Columns
- Split delimited data using Text to Columns
- Automatically subtotal a range
- Create nested subtotals
- Consolidate data from multiple data ranges
- Use data consolidation to generate quick subtotals from tables
- Validate numerical data
- Create user-friendly messages for validation errors
- Create data validation input messages
- Add a formula-driven date validation and a text length validation

- Add a table-based dynamic list validation
- Use a formula-driven custom validation to enforce complex business rules
- Remove duplicate values from a table
- Use a custom validation to add a unique constraint to a column

Session 3: Advanced Functions

- Understand precedence rules and use the Evaluate feature
- Use common functions with Formula AutoComplete
- Use the Insert Function dialog and the PMT function
- Use the PV and FV functions to value investments
- Use the IF logic function
- Use the SUMIF and COUNTIF functions to create conditional totals
- Understand date serial numbers
- Understand common date functions
- Use the DATEDIF function
- Use date offsets to manage projects using the scheduling equation
- Use the DATE function to offset days, months and years
- Enter time values and perform basic time calculations
- Perform time calculations that span midnight
- Understand common time functions and convert date serial numbers to decimal values
- Use the TIME function to offset hours, minutes and seconds
- Use the AND and OR functions to construct complex Boolean criteria
- Understand calculation options (manual and automatic)
- Concatenate strings using the concatenation operator (&)
- Use the TEXT function to format numerical values as strings
- Extract text from fixed width strings using the LEFT, RIGHT and MID functions
- Extract text from delimited strings using the FIND and LEN functions
- Use a VLOOKUP function for an exact lookup
- Use an IFERROR function to suppress error messages
- Use a VLOOKUP function for an inexact lookup

Session 4: Using Names and the Formula Auditing Tools

- Automatically create single-cell range names

- Manually create single cell range names and named constants
- Use range names to make formulas more readable
- Automatically create range names in two dimensions
- Use intersection range names and the INDIRECT function
- Create dynamic formula-based range names using the OFFSET function
- Create table based dynamic range names
- Create two linked drop-down lists using range names
- Understand the #NUM!, #DIV/0! and #NAME? error values
- Understand the #VALUE!, #REF! and #NULL! error values
- Understand background error checking and error checking rules
- Manually check a worksheet for errors
- Audit a formula by tracing precedents
- Audit a formula by tracing dependents
- Use the Watch Window to monitor cell values
- Use Speak Cells to eliminate data entry errors

Session 5: What If Analysis and Security

- Create a single-input data table
- Create a two-input data table
- Define scenarios
- Create a scenario summary report
- Use Goal Seek
- Use Solver
- Hide and unhide worksheets, columns and rows
- Create custom views
- Prevent unauthorized users from opening or modifying workbooks
- Control the changes users can make to workbooks
- Restrict the cells users are allowed to change
- Allow different levels of access to a worksheet with multiple passwords
- Create a digital certificate
- Add an invisible digital signature to a workbook
- Add a visible digital signature to a workbook

Session 6: Working with Hyperlinks, Other Applications and Workgroups

- Hyperlink to worksheets and ranges

- Hyperlink to other workbooks and the Internet
- Hyperlink to an e-mail address and enhance the browsing experience
- Embed an Excel worksheet object into a Word document
- Embed an Excel chart object into a Word document
- Link an Excel worksheet to a Word document
- Understand the three different ways to share a workbook
- Share a workbook using the lock method
- Share a workbook using the merge method
- Share a workbook on a network
- Accept and reject changes to shared workbooks

Session 7: Forms and Macros

- Add group box and option button controls to a worksheet form
- Add a combo box control to a worksheet form
- Set form control cell links
- Connect result cells to a form
- Add a check box control to a worksheet form
- Use check box data in result cells
- Add a temperature gauge chart to a form
- Add a single input data table to a form
- Improve form appearance and usability
- Understand macros and VBA
- Record a macro with absolute references
- Understand macro security
- Implement macro security
- Understand trusted documents
- Record a macro with relative references
- Use shapes to run macros
- Run a macro from a button control
- Show and hide ribbon tabs
- Add custom groups to standard ribbon tabs
- Create a custom ribbon tab

Session 8: Pivot Tables

- Create a one-dimensional pivot table report from a table
- Create a grouped pivot table report

- Understand pivot table rows and columns
- Understand the pivot table data cache
- Apply a simple filter and sort to a pivot table
- Use report filter fields
- Filter a pivot table visually using slicers
- Add a timeline control to a pivot table
- Use slicers to create a custom timeline
- Use report filter fields to automatically create multiple pages
- Format a pivot table using PivotTable styles
- Create a custom pivot table style
- Understand pivot table report layouts
- Add/remove subtotals and apply cell styles to pivot table fields
- Display multiple summations within a single pivot table
- Add a calculated field to a pivot table
- Add a calculated item to a pivot table
- Group by text, date and numeric value ranges
- Show row data by percentage of total rather than value
- Use pivot table values in simple formulas
- Use the GETPIVOTDATA function
- Create a pivot chart from a pivot table
- Embed multiple pivot tables onto a worksheet
- Use slicers to filter multiple pivot tables

Sessions 9-11 cover OLAP technology

Microsoft introduced some extremely sophisticated OLAP (On Line Analytical Processing) tools into Excel 2013. This was further expanded in Excel 2016. OLAP skills are not commonly found in Excel users (even IT professionals often struggle with data modeling and OLAP concepts).

Recognizing that OLAP skills will not be needed by many users (even Excel experts) we placed the OLAP related skills into the last three sessions of the *Expert skills* book.

These sessions cover not only the new OLAP related features, but also the relational modeling theory needed to understand and use them. Full coverage is given to the new OLAP pivot table (a new type of pivot table that can be used with an OLAP data source).

OLAP is the key to working with *Big Data* (in an Excel context, *Big Data* is data that has more than a million rows). In the OLAP sessions you'll sometimes work with very large data sets that contain well over a million rows (exceeding the capacity of an Excel worksheet).

Session 9: Data Modeling, OLAP and Business Intelligence

- Import tables from an external relational database
- Understand primary and foreign keys
- Link primary and foreign keys using VLOOKUP
- Efficiently import data using a view
- Understand linked tables
- Work with big data
- Create a simple data model
- Understand OLAP pivot tables
- Understand OLAP cubes and Business Intelligence
- Create an OLAP pivot table directly from a relational database
- Understand many-to-many relationships
- Create an OLAP pivot table using a many-to-many relationship
- Understand MDX queries and OLAP pivot table limitations
- Use the CUBEVALUE function to query an OLAP cube
- Convert CUBEVALUE functions to include MDX expressions
- Create an asymmetric OLAP pivot table using Named Sets

Session 10: 3D Maps

- Create a simple 3D Map
- Confirm the accuracy of geocoding
- Map using different location fields
- Apply filters to a 3D Map
- Set layer options and customize data cards
- Add a height field to a layer
- Apply different visualization types
- Visualize multiple categories
- Create a visualization with multiple layers
- Add annotations
- Create a video from temporal data
- Set scene options
- Create a tour with multiple scenes

Session 11: Create Get & Transform queries

- Understand Get & Transform and ETL
- Create a simple extract and load web query

- Understand queries and connections
- Move, remove, rename, filter and sort columns
- Split delimited data
- Specify data types
- Understand steps and PQFL
- Remove empty, error and top and bottom rows
- Understand and work with null values
- Transform date and time columns
- Transform number columns
- Add a custom calculated column
- Create an aggregated data query
- Unpivot aggregated data
- Work with multiple queries
- Create an append query
- Understand normal and de-normalized data
- Create a simple two-table merged query
- Create a five-table merged query

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