

Make sure that this is the right book for your Excel version

This book is designed only for use with **Excel 2019**.

There are two different current Windows versions of Excel: *Excel 2019* and *Excel 365* (we publish a different book: *Learn Excel 365 Expert Skills with The Smart Method* for the Excel 365 version).

Excel 2019 is a “pay once and use forever” product. *Excel 365* is a subscription product (pay monthly or pay annually) that is automatically updated with a new semi-annual version in January and July each year.

Why you should use this book

- **It provides a thorough coverage of Power Pivot, Power Query, data modeling and DAX.** Power Pivot is an advanced professional tool for designing OLAP multi-dimensional databases. It is impossible to effectively use Power Pivot without first acquiring the relational modeling and OLAP theory needed to use it. This book will not only teach you DAX but will also give you all the OLAP data modeling skills you need in order to use Power Pivot and Get & Transform/Power Query effectively.
- **It won't waste your time by teaching basic Excel 2019 skills that you already know.** This isn't a beginner's book. If you are an absolute beginner, you need our *Excel 2019 Essential Skills* book. By assuming that you are already able to use Excel's basic features, far more ground can be covered.
- **Learning success is guaranteed.** For over fifteen years, Smart Method® courses have been used by large corporations, government departments and the armed forces to train their employees. This book has been constantly refined (during hundreds of classroom courses) by observing which skills students find difficult to understand and then developing simpler and better ways of explaining them. This has made the book effective for students of all ages and abilities.
- **It is the book of choice for teachers.** As well as catering for those wishing to learn Excel by self-study, Smart Method® books have long been the preferred choice for Excel teachers as they are designed to teach Excel and not as reference books. Books follow best-practice adult teaching methodology with clearly defined objectives for each learning session and an exercise to confirm skills transfer. With single, self-contained lessons, the books cater for any teaching or self-learning period (from minutes to hours).
- **Smart Method® books are #1 best sellers.** Every paper printed Smart Method® Excel book (and there have been ten of them starting with Excel 2007) has been an Amazon #1 best seller in its category. This provides you with the confidence that you are using a best-of-breed resource to learn Excel.
- **It teaches to true Expert level.** This *Expert Skills* book teaches Excel to an extremely high level of competence that is very rarely found in the workplace (even amongst top professionals). At Expert level your skills will be greater and broader than almost all other Excel users and you will understand (and be able to effectively use) absolutely every Excel and Power Pivot feature. You'll have a complete mastery of skills that are often even a mystery to Excel power users.

Master Excel expert skills by setting aside just a few minutes each day

This book makes it easy to learn at your own pace because of its unique presentational style. The book contains short self-contained lessons and each lesson only takes a few minutes to complete.

You can complete as many, or as few, lessons as you have the time and energy for each day. Many learners have developed expert-level skills by setting aside just a few minutes each day to complete a single lesson.

Every lesson is presented on two facing pages

Pray this day, on one side of one sheet of paper, explain how the Royal Navy is prepared to meet the coming conflict.

Winston Churchill, Letter to the Admiralty, Sep 1, 1939

Winston Churchill was aware of the power of brevity. The discipline of condensing thoughts into one side of a single sheet of A4 paper resulted in the efficient transfer of information.

A tenet of our teaching system is that every lesson is presented on *two* facing sheets of A4. We've had to double Churchill's rule as they didn't have to contend with screen grabs in 1939! If we can't teach an essential concept in two pages of A4 we know that the subject matter needs to be broken into two smaller lessons.

How this book avoids wasting your time

Over the years I have read many hundreds of computer text books and most of my time was wasted. The big problem with most books is that I must wade through thousands of words just to learn one important technique. If I don't read everything I might miss that one essential insight.

Many presentational methods have been used in this book to help you to avoid reading about things you already know how to do, or things that are of little interest to you.

Lessons are logically grouped into *Lessons* and *Sessions* that are numbered for easy reference. This example shows *Lesson 28* in *Session 3*.

Screen grabs are provided in-line with the text when they can explain what you need to do more clearly than words alone.

If you want to progress through the course as quickly as possible you don't have to read notes.

Notes usually expand a little on the information given in the lesson text.

If you already know how to do something simply read the bold text for each step and just do it. Step notes sometimes provide precise instructions about how to progress if the one-line description is inadequate. Notes also often include interesting information about the current task.

When there is a sample file (or files) to accompany a lesson, the file name will be shown in a folder icon. You can download the sample file set from: <https://TheSmartMethod.com>

Learn Excel 365 Expert Skills with The Smart Method

note

VLOOKUP is still (usually) a better solution than IFS

In: Lesson 3-5: Use the IF logic function (sidebar) I advised:
 "Excel allows you to nest IF functions up to 64 levels deep (which is 63 too many)".

The new IFS and SWITCH functions (introduced in Feb 2016) are mainly intended to offer a simpler alternative to nested IF functions.

This doesn't mean using the IFS and SWITCH functions provides a better solution than VLOOKUP.

It is easy to introduce errors using IFS and SWITCH, as the order in which the logic pairs are listed is vital to the correct operation of the function.

In almost all business situations a VLOOKUP will provide a better and more elegant solution than the use of the IFS or SWITCH function.

Lesson 3-28: Use the IFS function

In: Lesson 3-25: Use a VLOOKUP function for an inexact lookup, you used a VLOOKUP function to return a grade from different pass mark percentages.

In this lesson you will solve exactly the same problem posed in: Lesson 3-25: Use a VLOOKUP function for an inexact lookup, with a logic based (rather than lookup based) solution.

1 Open *IFS Grades-1* from your sample files folder.

	A	B	C	D	E	F
1	Exam Results					
2						
3	Name	Percentage	Grade	Percentage	Grade	
4	Johnny Caine	70%		0%	Fail	
5	George Marley	68%		60%	C	
6	Betty Anan	88%		70%	B	
7	Paris Winfrey	80%		80%	A	
8	Ozzy Dickens	95%		90%	A*	
9	Johnny Roberts	84%				

This is an exact duplicate of the *Grades-1* sample file that you used at the beginning of: *Lesson 3-25: Use a VLOOKUP function for an inexact lookup.*

2 Use the IFS function to calculate the grade for each student by defining grade data within the function.

Sometimes it may be better to "hard code" data (such as the percentage grade thresholds) within the function itself. This prevents users from accidentally deleting or changing the grade percentage thresholds within the worksheet.

The argument against this approach is that the worksheet is more difficult to maintain if grade thresholds change in the future.

- Click in cell C4.
- Click: Formulas → Function Library → Logical → IFS.

The *Function Arguments* dialog for the IFS function appears.

The IFS function accepts up to 127 *Logical Test/Value* pairs.

- Enter the following pair of arguments:

Logical_test1	B4 < 60%	↑
Value_if_true1	"Fail"	↑

The *Logical Test* is an expression that returns TRUE or FALSE. In this case the test asks if Johnny Caine's percentage is less than 60%.

As Johnny scored 70%, the result is FALSE (as 70% is not less than 60%). If Johnny had a percentage score of less than 60%, the function would have returned the text "Fail".

IFS Grades-1

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Learning by participation

Tell me, and I will forget. Show me, and I may remember. Involve me, and I will understand.

Confucius, Chinese teacher, editor, politician and philosopher (551-479 BC)

Confucius would probably have agreed that the best way to teach IT skills is hands-on (actively) and not hands-off (passively). This is another of the principal tenets of The Smart Method® teaching method.

Research has backed up the assertion that you will learn more material, learn more quickly, and understand more of what you learn if you learn using active, rather than passive methods.

For this reason, pure theory pages are kept to an absolute minimum with most theory woven into the hands-on lessons, either within the text or in sidebars.

This echoes the teaching method used in Smart Method classroom courses where snippets of pertinent theory are woven into the lessons themselves so that interest and attention is maintained by hands-on involvement, but all necessary theory is still covered.

Session Three: Advanced Functions

Logical_test1	B4 < 60%
Value_if_true1	"Fail"
Logical_test2	B4 < 70%
Value_if_true2	"C"
Logical_test3	B4 < 80%
Value_if_true3	"B"
Logical_test4	B4 < 90%
Value_if_true4	"A"
Logical_test5	B4 >= 90%
Value_if_true5	"A"

Note that textual values must be placed in double quotation marks. If you omit to do this Excel will add them for you.

- Add *Logical Test/Value* pairs for the other grades (see sidebar).
- Click the OK button.

Johnny Caine's B grade is shown in cell C4.

- AutoFill cell C4 to the end of the range.

All grades are now correctly shown.

	A	B	C	D	E	F
3	Name	Percentage	Grade	Percentage	Grade	
4	Johnny Caine	70%	B	0%	Fail	
5	George Marley	68%	C	60%	C	
6	Betty Anan	86%	A	70%	B	
7	Paris Winfrey	80%	A	80%	A	
8	Ozzy Dickens	95%	A*	90%	A*	

Whenever something can easily go wrong, or when the subject text is particularly important, you will see the *important* sidebar. You should always read important sidebars.

important

Excel recognizes text as having a value in logical expressions

If you try entering text into the *Percentage* column you might be surprised to find this result:

	A	B	C
3	Name	Percentage	Grade
4	Johnny Caine	teacup	A*
5	George Marley	68%	C

Excel has evaluated this logical expression:

= "teacup" > 90%

... and has surprisingly returned TRUE.

This seems puzzling at first until you realize that (behind the scenes) Excel assigns numeric values to text in order to implement alphabetical sorting.

These numeric values are always higher than any number so that (in an A-Z sort) numbers will always come before text.

To work around this peculiarity, you could add a new first *Logical Test/Value* pair to ensure that the value in column B was numeric like this:

Logical_test1	=ISNUMBER(B4)=FALSE
Value_if_true1	"Error"

- Use the *IFS* function to calculate the grade for each student using the grade data defined in cells E3:F8.

- Delete the functions in column C.
- Enter the following pair of *Logical Test/Value* arguments:

Logical_test1	B4 <= E5	= FALSE
Value_if_true1	"Fail"	= "Fail"

Notice the use of an absolute reference for cell E5. This is needed to make sure that the formula AutoFills correctly.

If you do not understand absolute references see: *Lesson 1-10: Add percentage and running totals using Quick Analysis* (sidebar).

You could also have used \$F\$4 to reference the text: "Fail" in cell F4 like this:

Logical_test1	B4 <= E5	= FALSE
Value_if_true1	\$F\$4	= "Fail"

Personally I prefer the literal text approach in this case as it makes the formula easier to read and thus less prone to error.

- Add appropriate *Logical Test/Value* pairs for the other grades.
- Click the OK button.
- AutoFill cell C4 down to the end of the range.

Exactly the same grade values are now shown. The difference from the first approach is that the grades will change if the Percentage thresholds shown in cells E4:E8 change in the future.

Each lesson models a real-world business problem. You'll immediately appreciate the value and relevance of each skill you learn.

- Save your work as *IFS Grades-2*.

A goal of this book is not to waste your time by explaining any skill twice. Sometimes you may forget something that has already been covered earlier in the course.

Cross-references are extensively used, pointing you back to the lesson in which the relevant skills were learned. The cross-references also help when you use this course as a reference book but have forgotten the more basic skills needed to complete each step.

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Who Is This Book for?

If you can already use all of Excel's essential features but want to raise your skills to true Expert level, you've found the right book.

This book isn't for absolute beginners. If you're just starting out with Excel, you should buy our *Essential Skills* book to learn all of Excel's most important features.

This book will give you advanced Excel skills that are rarely mastered by Excel users. By the end of the book you'll be a true Excel expert, able to use all of the power available from the world's most powerful business tool. Your Excel skills will be greater and broader than almost all other Excel users in the workplace.

This book is for *Excel 2019* users who:

- Are already comfortable with Excel 2019's basic features (ideally by completing all of the lessons in our *Essential Skills* book).
- Want in-depth coverage of all Excel 2019's more powerful and complex features rather than a simple overview.
- Want an in-depth knowledge of multidimensional analysis using the new Power Pivot add-in (now included in all Excel versions).
- Want to master the other OLAP "power" tools now included in all Excel versions, the tools previously known as Power Query (now re-named: Get & Transform) and Power Maps (now re-named: 3D Maps).
- Schools, colleges and universities who wish to provide advanced Excel 2019 training courses.

Use of this book as courseware

While this book is effective for self-instruction, the book is also the official courseware for The Smart Method's *Excel 2019 Expert Skills* course.

Smart Method courses have been taken by a varied cross-section of the world's leading companies. We've had fantastic feedback from the vast number of professionals we've empowered with Excel skills.

This book is also suitable for use by other training organizations, teachers, schools, colleges and universities to provide structured, objective-led, and highly effective classroom courses.