

Guided Computer Tutorials

Learning Microsoft[®] Excel[®] 2016

Module 2

By Greg Bowden

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Learning Microsoft Excel 2016

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Making Predictions With Excel

One of the many advantages of using a spreadsheet is that it allows you to make predictions about possible outcomes; for example, predicting profits, wages bills or sales. In this chapter you will use a spreadsheet to predict the possible profits for a motel.

The Motel Template

You are the manager of a seaside motel which does most of its business during the summer months. It has 20 single rooms and 30 doubles. Prices must be set to ensure enough profit is made in the holiday season to stay in business through the leaner winter months.

You know from past experience that single room occupants will spend an average of \$15 a day on food, whilst double room occupants will spend \$20.

A Loading the Template

- 1 Load Microsoft Excel 2016 and click on the OPEN icon in the QUICK ACCESS TOOLBAR or from within the FILE tab or FILE menu.
- 2 Access the EXCEL 2016 SUPPORT FILES folder and open the CHAPTER 11 folder.
- 3 Open the MOTEL template, selecting YES to the READ-ONLY dialogue box.

B Calculating the Income From Rooms

You will now be working with longer formulas. The INCOME FROM ROOMS is found by:

- Multiplying the SINGLE ROOMS OCCUPIED by the SINGLE ROOM RATE, that is:
 $B3 * B6$
- Multiplying the DOUBLE ROOMS OCCUPIED by the DOUBLE ROOM RATE, that is:
 $B4 * B7$
- Combining the two parts into a single formula we have:

$$= (B3 * B6) + (B4 * B7)$$

	A	B	C	D	E	F	G	H
1	SURFSIDE MOTEL							
2								
3	Single Rooms Occupied	20						
4	Double Rooms Occupied	30						
5								
6	Single Room Rate	\$25.00		New Single Room Rate				
7	Double Room Rate	\$35.00		New Double Room Rate				
8								
9	Income From Rooms	\$1,550.00		Increase in Room Income				
10	Income From Food			Increase in Food Income				
11								
12	Total Daily Income			New Total Daily Income				
13								

Click in cell B9 and enter the formula:

$$= (B3 * B6) + (B4 * B7)$$

NOTE: The brackets in the formula are not essential, but they do help to show clearly the two sections of the formula (income from single rooms and income from double rooms).

C Calculating the Income From Food

The INCOME FROM FOOD is calculated by:

- Multiplying SINGLE ROOMS OCCUPIED by \$15 which is the average amount spent on food by single room occupants, that is: $B3 * 15$
- Multiplying DOUBLE ROOMS OCCUPIED by \$20, that is: $B4 * 20$
- Combining the two parts of the formula together we have:

$$= (B3 * 15) + (B4 * 20)$$

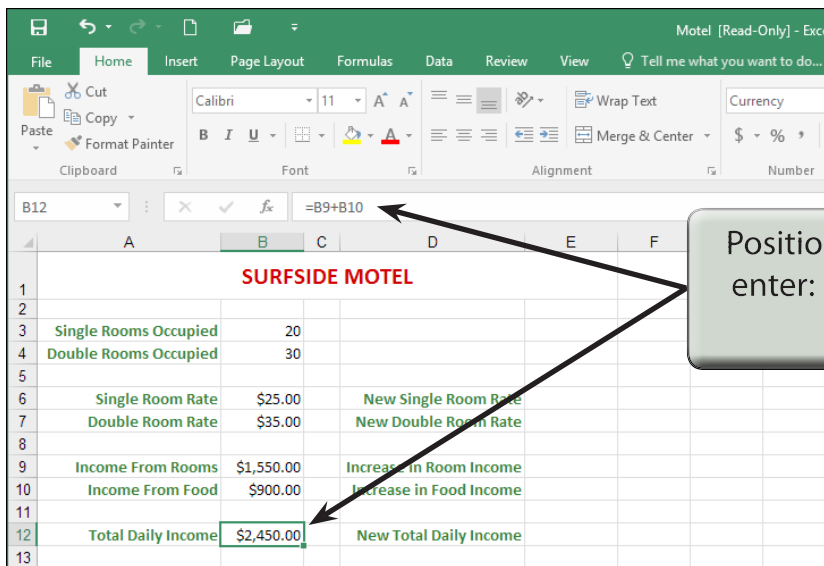
	A	B	C	D	E	F	G	H
1	SURFSIDE MOTEL							
2								
3	Single Rooms Occupied	20						
4	Double Rooms Occupied	30						
5								
6	Single Room Rate	\$25.00		New Single Room Rate				
7	Double Room Rate	\$35.00		New Double Room Rate				
8								
9	Income From Rooms	\$1,550.00		Increase in Room Income				
10	Income From Food	\$900.00		Increase in Food Income				
11								
12	Total Daily Income			New Total Daily Income				
13								

Click in cell B10 and enter the formula:

$$= (B3 * 15) + (B4 * 20)$$

D Calculating the Total Daily Income

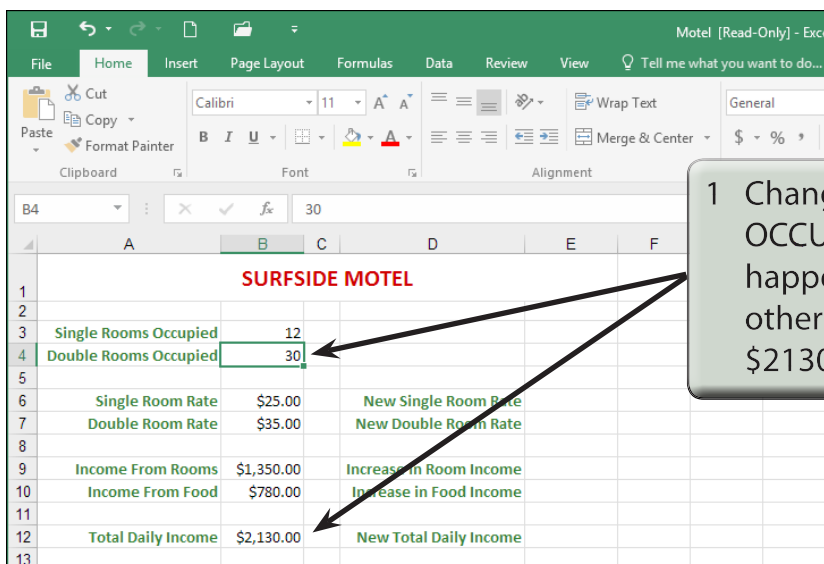
The TOTAL DAILY INCOME is simply the sum of the TOTAL INCOME FROM ROOMS and the TOTAL INCOME FROM FOOD.



SURFSIDE MOTEL			
Single Rooms Occupied	20		
Double Rooms Occupied	30		
Single Room Rate	\$25.00	New Single Room Rate	
Double Room Rate	\$35.00	New Double Room Rate	
Income From Rooms	\$1,550.00	Increase in Room Income	
Income From Food	\$900.00	Increase in Food Income	
Total Daily Income	\$2,450.00	New Total Daily Income	

E Using the Spreadsheet to Make Predictions

At the moment, with all rooms occupied, the numbers produce a TOTAL DAILY INCOME of \$2450. Let's experiment with some other values.



SURFSIDE MOTEL			
Single Rooms Occupied	12		
Double Rooms Occupied	30		
Single Room Rate	\$25.00	New Single Room Rate	
Double Room Rate	\$35.00	New Double Room Rate	
Income From Rooms	\$1,350.00	Increase in Room Income	
Income From Food	\$780.00	Increase in Food Income	
Total Daily Income	\$2,130.00	New Total Daily Income	

Making Decisions With Excel

We can instruct a spreadsheet to make decisions on entered labels and values. This is achieved by using the IF function, which takes the form:

IF (something is true, do this, otherwise, do something else)

The IF function uses mathematical symbols (operators) to make comparisons:

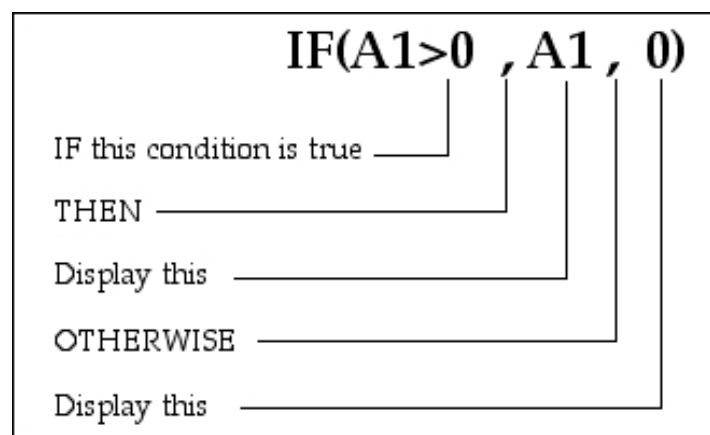
Operator	Meaning
<	less than
>	greater than
<=	less than or equal to
>=	greater than or equal to
=	equal to
<>	is not equal to

For example, look at the following formula:

=IF(A1>0,A1,0)

This formula reads: If the contents of cell A1 is greater than zero then display the contents of A1, otherwise display zero. The sections of an IF statement must be separated by commas. The first comma stands for 'then' and the second comma stands for 'otherwise'.

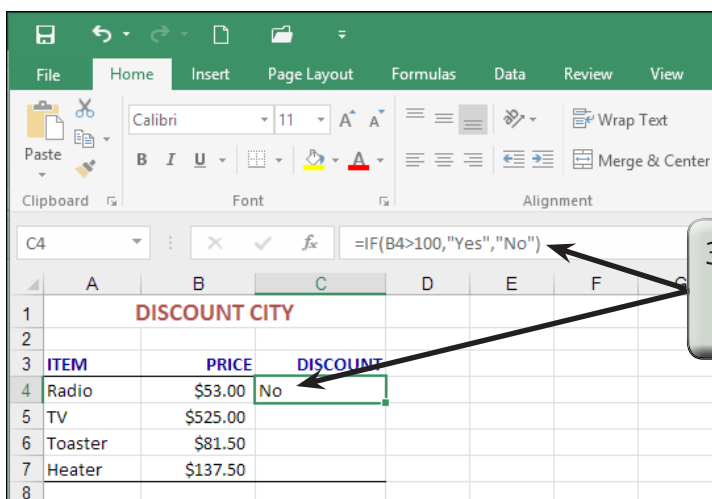
The following diagram shows the sections of the formula:



The IF Command

A template for a company that gives discounts on items priced over \$100 will be used.

- 1 Load Microsoft Excel 2016 or close the current documents and click on the OPEN icon in the QUICK ACCESS TOOLBAR or from within the FILE tab or FILE menu.
- 2 Access the EXCEL 2016 SUPPORT FILES, open the CHAPTER 12 folder and load the CHAPTER 12 file, selecting YES to the READ-ONLY message.

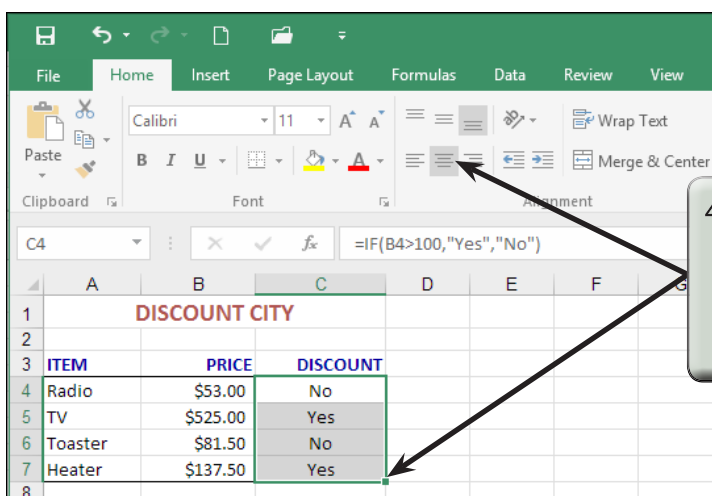


The screenshot shows the Microsoft Excel 2016 interface. The formula bar at the top displays the formula `=IF(B4>100,"Yes","No")`. The spreadsheet below has the following data:

DISCOUNT CITY		
ITEM	PRICE	DISCOUNT
Radio	\$53.00	No
TV	\$525.00	
Toaster	\$81.50	
Heater	\$137.50	

3 In cell C4 enter the formula:
`= IF(B4>100,"Yes","No")`

NOTE: The spreadsheet is being told that if the contents of the cell B4 is greater than 100, then display YES, otherwise display NO. Quotation marks are used around YES and NO because they are LABELS.



The screenshot shows the Microsoft Excel 2016 interface. The formula bar at the top displays the formula `=IF(B4>100,"Yes","No")`. The spreadsheet below has the following data:

DISCOUNT CITY		
ITEM	PRICE	DISCOUNT
Radio	\$53.00	No
TV	\$525.00	Yes
Toaster	\$81.50	No
Heater	\$137.50	Yes

4 Autofill the formula down 3 cells and format the 4 labels to CENTRE. You should have a YES displayed next to prices over \$100.

5 Change the cost of the Heater to \$95.60 and observe the change.

	A	B	C	D	E	F
1		DISCOUNT CITY				
2						
3		ITEM	PRICE	DISCOUNT		
4		Radio	\$53.00	No		
5		TV	\$525.00	Yes		
6		Toaster	\$81.50	No		
7		Heater	\$95.60	No		
8						

6 Mathematical calculations can also be done within IF functions.

7 Position the cursor at cell C4, enter:
= IF(B4>100,B4*10%, "")
and press <enter> or <return>.

	A	B	C	D	E	F
1		DISCOUNT CITY				
2						
3		ITEM	PRICE	DISCOUNT		
4		Radio	\$53.00			
5		TV	\$525.00	Yes		
6		Toaster	\$81.50	No		
7		Heater	\$95.60	No		
8						

- NOTE:**
- i For the "", press the double quotation key twice.
 - ii The formula reads: If the value in cell B4 is greater than 100, then work out and display B4 times 10%, otherwise display a blank space (two quotes entered next to one another).
 - iii You should receive a blank space in cell C4 as the Radio costs less than \$100.

Chapter 12 [Read-Only] - Excel

File Home Insert Page Layout Formulas Data Review View Tell me what you want to do...

Clipboard Font Alignment Number

Calibri 11 A A

B I U

Wrap Text

Merge & Center

Currency

\$ % ' .00 .00

Conditional Formatting

8 Autofill the formula down for the other 3 cells then format the 4 cells to CURRENCY with two decimal places and to be RIGHT ALIGNED.

	A	B	C	D	E	F
1	DISCOUNT CITY					
2						
3	ITEM	PRICE	DISCOUNT			
4	Radio	\$53.00				
5	TV	\$525.00	\$52.50			
6	Toaster	\$81.50				
7	Heater	\$95.60				

Chapter 12 [Read-Only] - Excel

File Home Insert Page Layout Formulas Data Review View Tell me what you want to do...

Clipboard Font Alignment

Calibri 11 A A

B I U

Wrap Text

Merge & Center

Custom

\$ % ' .00 .00

Conditional Formatting

9 Change the price of the Toaster to \$137.50 and a discount should be allocated to it.

	A	B	C	D	E	F
1	DISCOUNT CITY					
2						
3	ITEM	PRICE	DISCOUNT			
4	Radio	\$53.00				
5	TV	\$525.00	\$52.50			
6	Toaster	\$137.50	\$13.75			
7	Heater	\$95.60				

Chapter 12 [Read-Only] - Excel

File Home Insert Page Layout Formulas Data Review View Tell me what you want to do...

Clipboard Font Alignment

Calibri 11 A A

B I U

Wrap Text

Merge & Center

Custom

\$ % ' .00 .00

Conditional Formatting

10 Change the cost of the Toaster to \$100. A discount is not given because the value is not over \$100.

	A	B	C	D	E	F
1	DISCOUNT CITY					
2						
3	ITEM	PRICE	DISCOUNT			
4	Radio	\$53.00				
5	TV	\$525.00	\$52.50			
6	Toaster	\$100.00				
7	Heater	\$95.60				

Lookup Commands

The LOOKUP COMMAND allows you to copy data from a table and insert that data in other parts of the spreadsheet. It saves time re-entering the same data over and over. To look up information from a table you need to use the LOOKUP function.

There are two different types of LOOKUP functions, VLOOKUP for searching vertically in columns and HLOOKUP for searching horizontally across rows. We will use the VLOOKUP function in this chapter, but the HLOOKUP function works in the same way.

Interest Rate Calculations

Many banks offer varying degrees of interest depending on the amount deposited in the account. We can use the LOOKUP function to display the correct amount of interest on any entered deposit.

A Loading the Template

- 1 Load Microsoft Excel 2016 or close the current files and click on the OPEN icon in the QUICK ACCESS TOOLBAR or from within the FILE tab or FILE menu.
- 2 Access the EXCEL 2016 SUPPORT FILES, open the CHAPTER 13 folder and load the INTEREST TABLE file, selecting YES to the READ-ONLY message.

3 In cell B2 enter the value: \$18500. This is the balance that we are going to calculate interest on.

	A	B	C	D	E	F	G
1			INTEREST TABLE				
2	BALANCE:	\$18,500.00					
3			BALANCE		RATE		
4	INTEREST			\$5,000.00	2.5%		
5	DUE:			\$10,000.00	3.0%		
6				\$15,000.00	3.5%		
7				\$20,000.00	4.0%		
8				\$25,000.00	4.5%		
9				\$30,000.00	5.0%		
10							

B Calculating the Interest Due

We need to use the LOOKUP function to find the interest due on the balance. Microsoft Excel will look up the table and find the EQUAL OR CLOSEST LOWER value to the balance (\$15000).

1 Move the cursor to cell B5 and enter the formula:

```
=VLOOKUP(B2,D4:E9,2)
```

2 In the HOME tab of the RIBBON format the value to PER CENT with 1 decimal place.

		INTEREST TABLE	
		BALANCE	RATE
1			
2	BALANCE:	\$18,500.00	
3			
4	INTEREST	3.5%	\$5,000.00
5	DUE:		\$10,000.00
6			\$15,000.00
7			\$20,000.00
8			\$25,000.00
9			\$30,000.00
10			

NOTE: The formula says: Look up the value stored in cell B2 then look at the values in the table, find the cell with the EQUAL or CLOSEST VALUE BELOW the B2 value, then display the adjacent value from the second column of the table - the value next to \$15000 (that is, 3.5%).

3 The LOOKUP function has three sections:

=VLOOKUP(B2, D4:E9, 2

Reference Cell
What cell to look up.

Display Column
How many columns across from the first column in the table the value should be taken from.

Range Reference
Indicates the start and end of the data table.

- NOTE:**
- i There should not be any spaces in the LOOKUP formula.
 - ii If we had wanted the **BALANCE (\$15000)** displayed instead of the **RATE**, we would have entered:

= VLOOKUP(B2,D4:E9,1)

the 1 indicates the first column of the table.

Interest Table [Read-Only] - Excel

File Home Insert Page Layout Formulas Data Review View Tell me what you want to do

Clipboard Font Alignment

B2 5296

	A	B	C	D	E	F	G	H	I	J	K	L
1				INTEREST TABLE								
2	BALANCE:	\$5,296.00										
3				BALANCE	RATE							
4	INTEREST	2.5%		\$5,000.00	2.5%							
5	DUE:			\$10,000.00	3.0%							
6				\$15,000.00	3.5%							
7				\$20,000.00	4.0%							
8				\$25,000.00	4.5%							
9				\$30,000.00	5.0%							
10												

4 Change the balance in cell B2 to \$5296. The Interest Due should change to 2.5%.

Interest Table [Read-Only] - Excel

File Home Insert Page Layout Formulas Data Review View Tell me what you want to do

Clipboard Font Alignment

B2 4000

	A	B	C	D	E	F	G	H	I	J	K	L
1				INTEREST TABLE								
2	BALANCE:	\$4,000.00										
3				BALANCE	RATE							
4	INTEREST	#N/A		\$5,000.00	2.5%							
5	DUE:			\$10,000.00	3.0%							
6				\$15,000.00	3.5%							
7				\$20,000.00	4.0%							
8				\$25,000.00	4.5%							
9				\$30,000.00	5.0%							
10												

5 Enter a balance below \$5000 and you will receive the #N/A error message.

NOTE: The error message indicates that Microsoft Excel cannot locate the closest lower value in COLUMN D. If possible it is always better to start a lookup table with zero value.

- 6 Experiment with some other balances and try to visualise what the LOOKUP function is doing each time.
- 7 Close the file without saving.

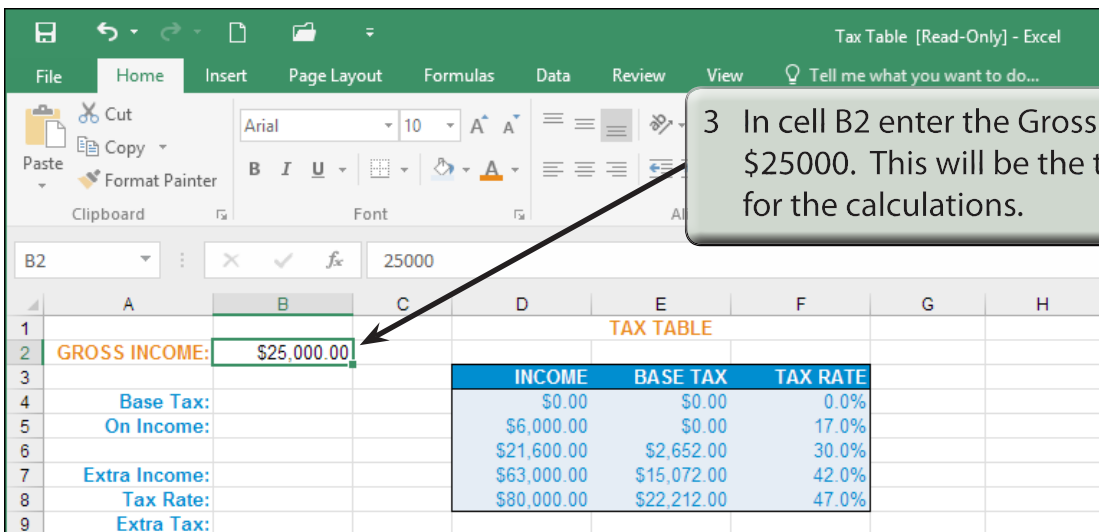
Income Tax Calculations

Income tax is calculated on a sliding rate. Using a table and the LOOKUP command is an efficient way to be able to calculate the income tax paid by any income.

The income tax table will have five cut-off incomes and a TAX RATE column which refers to the tax rate for the amount of income over the cut-off. For example, if a person earns \$25,000, he/she pays \$2,652 base tax on the first \$21,600 of their income, plus 30% of the remaining income, \$3400 (the amount earned over \$21,600).

A Loading the Template

- 1 Select the OPEN icon in the QUICK ACCESS TOOLBAR or from within the FILE tab or FILE menu.
- 2 Access the EXCEL 2016 SUPPORT FILES, open the CHAPTER 13 folder and load the TAX TABLE file, selecting YES to the READ-ONLY message.



3 In cell B2 enter the Gross Income: \$25000. This will be the test income for the calculations.

TAX TABLE		
INCOME	BASE TAX	TAX RATE
\$0.00	\$0.00	0.0%
\$6,000.00	\$0.00	17.0%
\$21,600.00	\$2,652.00	30.0%
\$63,000.00	\$15,072.00	42.0%
\$80,000.00	\$22,212.00	47.0%

Creating Sales Invoices

Many businesses create their own invoices (sales documents) and Microsoft Excel provides a medium for creating professional invoices, even linking them to a stock inventory.

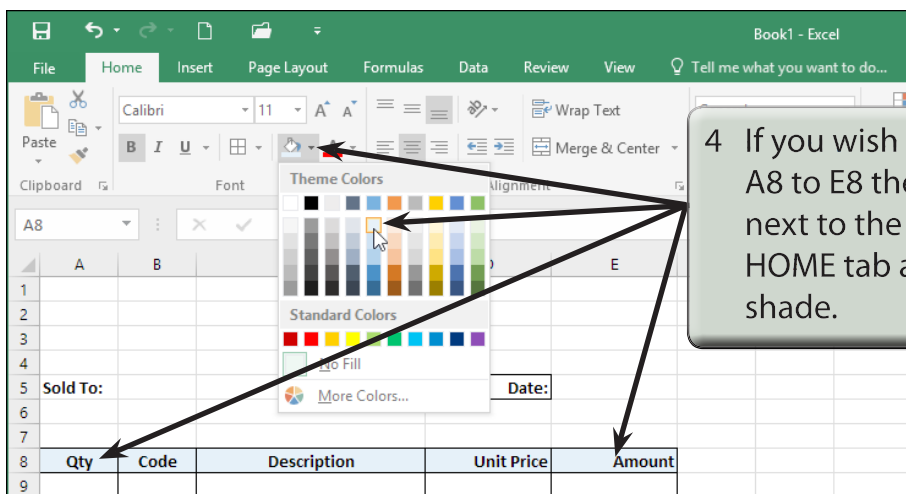
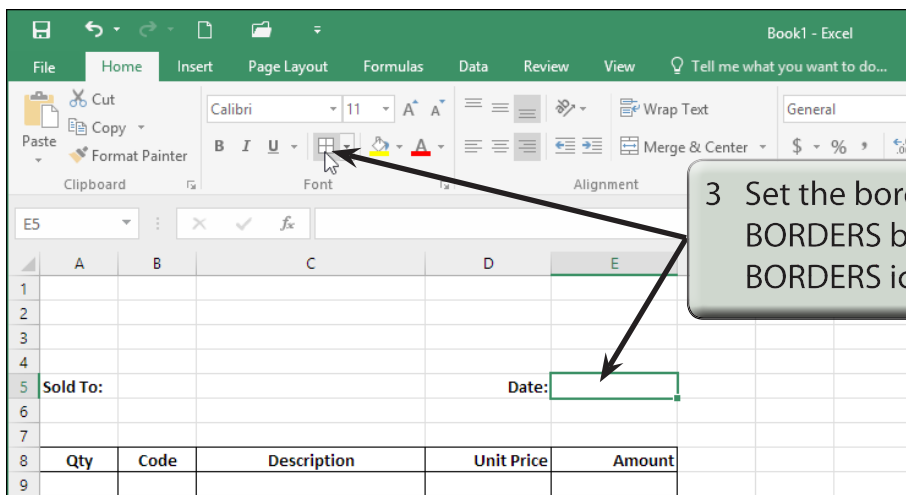
Entering the Labels of the Invoice

1 Start a new BLANK WORKBOOK and set the following initial formats:

- Widen COLUMN C to 26 characters.
- Widen COLUMNS D and E to 14 characters.

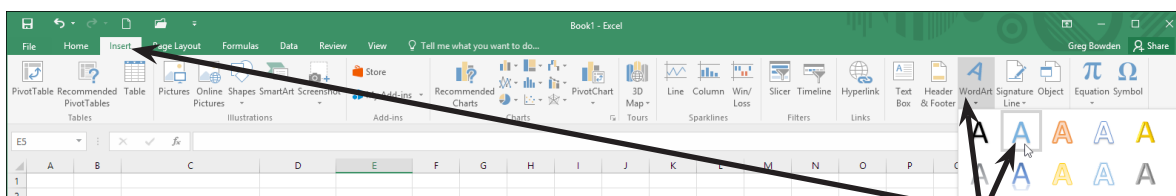
	A	B	C	D	E	F	G	H
1								
2								
3								
4								
5	Sold To:			Date:				
6								
7								
8	Qty	Code	Description	Unit Price	Amount			
9								
10								
11								
12								
13								
14								
15								
16				Sub-Total:				
17				GST:				
18				TOTAL:				

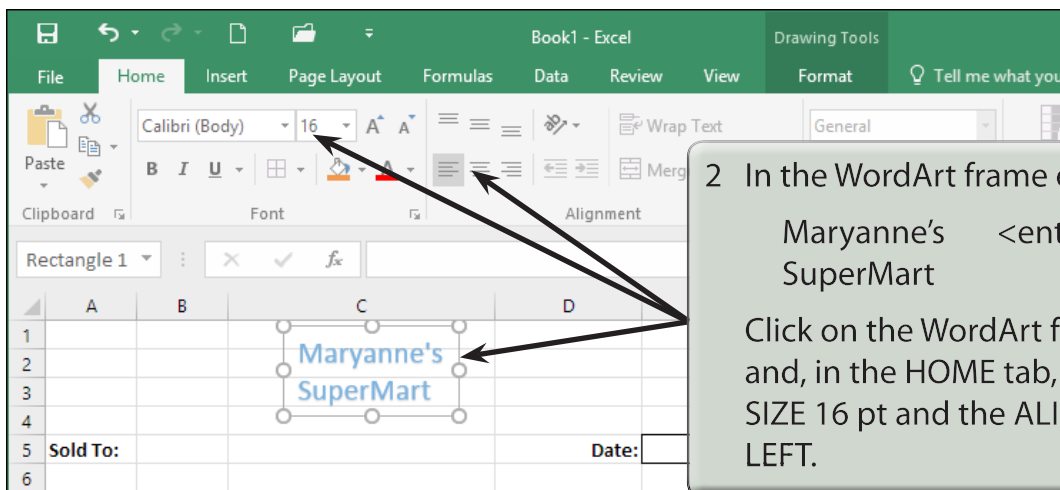
	A	B	C	D	E	F	G	H
1								
2								
3								
4								
5	Sold To:			Date:				
6								
7								
8	Qty	Code	Description	Unit Price	Amount			
9								
10								
11								
12								
13								
14								
15								
16				Sub-Total:				
17				GST:				
18				TOTAL:				



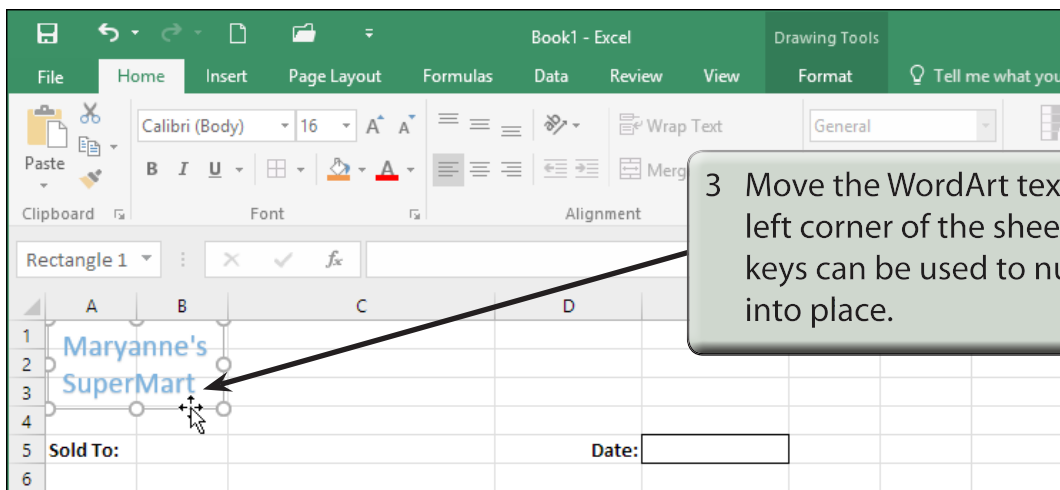
Creating the Company Title

The company's name needs to stand out from the rest of the invoice, although it should not be too overbearing. We will use WordArt in this case. We can also include a graphic or create a company logo.





NOTE: You can add some WordArt Effects and Styles to the text if you wish to.

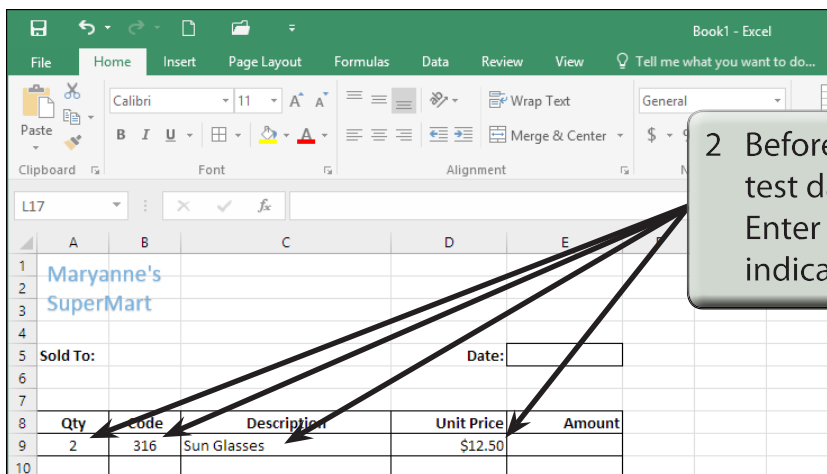


Entering the Calculations

To complete the invoice we need to enter some formulas so that calculations can be conducted by the invoice.

A Initial Settings

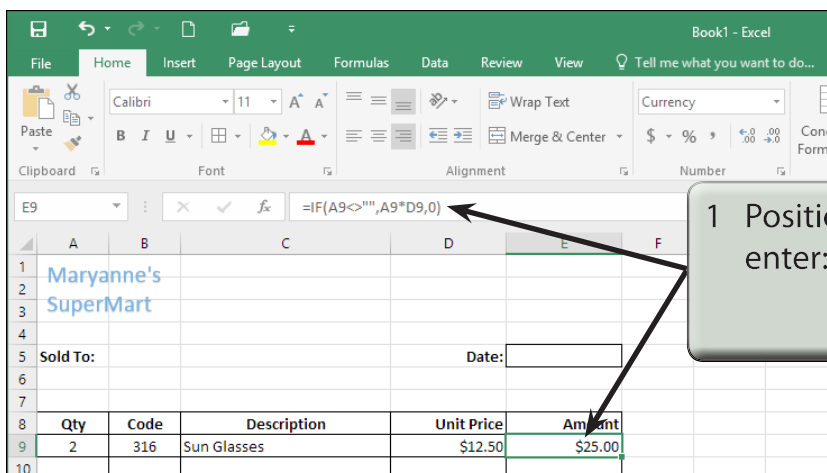
- Carry out the following formats:
 - Cells A9 to B15 to CENTRE ALIGNED.
 - Cells D9 to E18 to CURRENCY with 2 decimal places.



2 Before entering the formulas some test data will need to be entered. Enter the data shown in the indicated cells.

B Calculating the Amount

The AMOUNT is the UNIT PRICE times the QTY, but we don't want anything displayed until an item is entered. An IF formula can be used to achieve this.



1 Position the cursor at cell E9 and enter:

= IF(B9<>"",A9*D9,0)

NOTE: i This formula says: "If the CODE cell in this row is not blank, then multiply the QUANTITY by the UNIT PRICE otherwise display ZERO."

ii **<> stands for NOT EQUAL TO and "" stands for BLANK.**

Book1 - Excel

File Home Insert Page Layout Formulas Data Review View Tell me what you want to do...

Calibri 11 A⁺

Wrap Text

Currency

B I U Font Alignment Number

Clipboards

E9 X ✓ fx =IF(A9<>'',A9*D9,0)

	A	B	C	D	E
1	Maryanne's SuperMart				
2					
3					
4					
5	Sold To:			Date:	
6					
7					
8	Qty	Code	Description	Unit Price	Amount
9	2	316	Sun Glasses	\$12.50	\$25.00
10					\$0.00
11					\$0.00
12					\$0.00
13					\$0.00
14					\$0.00
15					\$0.00
16	Sub-Total:				
17	GST:				
18	TOTAL:				
19					

2 Autofill the DOWN to c

2 Autofill the formula from cell E9 DOWN to cell E15.

NOTE: Zeros are displayed in the filled cells because their corresponding values in column B are blank.

C Turning Zero Values Off

We needed to place zero values in the AMOUNT column if no code is entered rather than a blank space because we will be doing calculations with the amounts. You cannot do calculations with labels. However, we do not want the zero values to print so the zeros need to be turned off.

- 1 On the Windows system click on the FILE tab and select OPTIONS. On the Macintosh system display the EXCEL menu and select PREFERENCES.

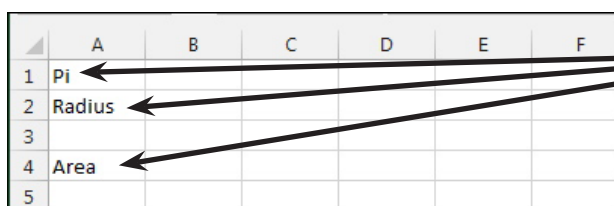
Sharing Data Between Files

In this chapter you will learn how to share information between different workbooks. This is called LINKING. In order to link spreadsheets together you need to know how to name cells. You can also share data between worksheets within a workbook as you will see in Chapter 17.

Naming Single Cells

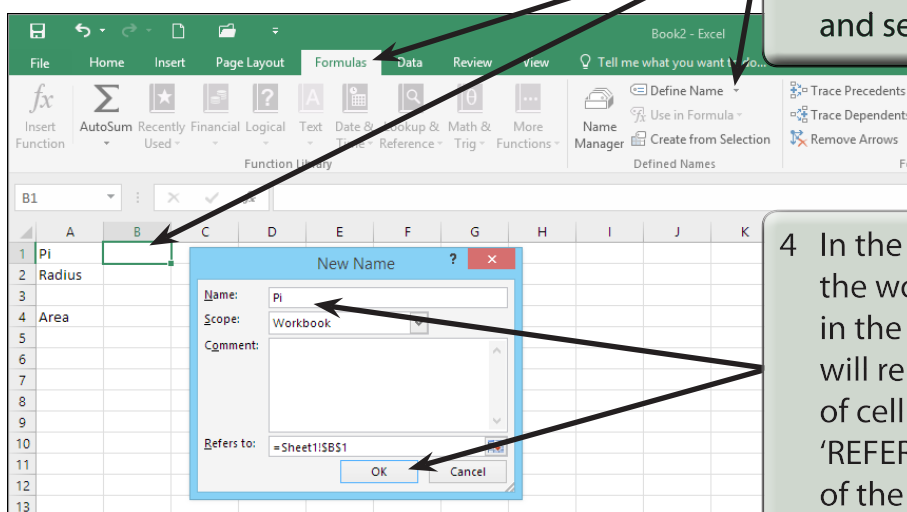
As you saw in the last chapter Microsoft Excel allows you to name cells. This can make formulas easier to understand and allows for quicker movement to cells. Naming cells also permits Microsoft Excel to transfer information from one workbook to another, that is, to LINK workbooks together. Let's use names to calculate the area of a circle.

- 1 Load Microsoft Excel or close the current files and start a new BLANK WORKBOOK.



	A	B	C	D	E	F
1	Pi					
2	Radius					
3						
4	Area					
5						

- 2 Enter the labels in the indicated cells.

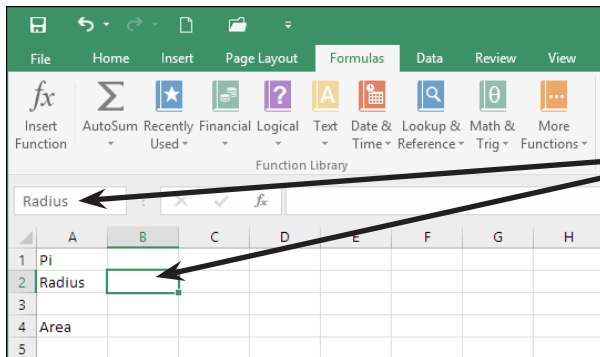


- 3 Move the cursor to cell B1, open the FORMULAS tab in the RIBBON and click on the arrow next to the DEFINE NAME icon and select DEFINE NAME.

- 4 In the NEW NAME dialogue box the word Pi should be inserted in the NAME box. This name will represent the contents of cell B1 as indicated in the 'REFERS TO' box at the bottom of the dialogue box.

- 5 Click on OK and Pi will be added to the name list.

NOTE: You can enter different names to those inserted by the program.



- 6 Move the cursor to cell B2, click in the NAME BOX in the FORMULA BAR, enter:

Radius

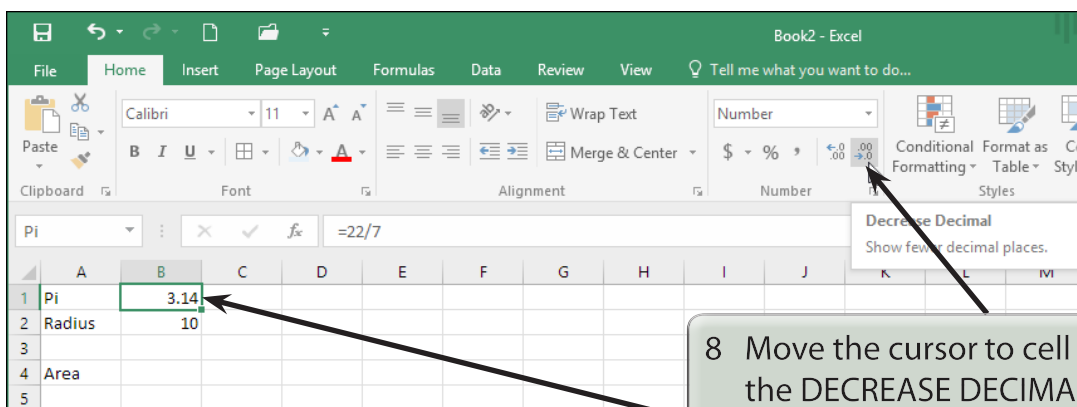
press the <enter> or <return>.

- NOTE:**
- i Entering the name in the NAME BOX is a shortcut to using the DEFINE NAME icon in the FORMULAS tab.
 - ii We have named the cell next to the label Pi as PI and the cell next to Radius as RADIUS.

- 7 Enter the following items in the indicated cells:

in cell B1: =22/7

in cell B2: 10

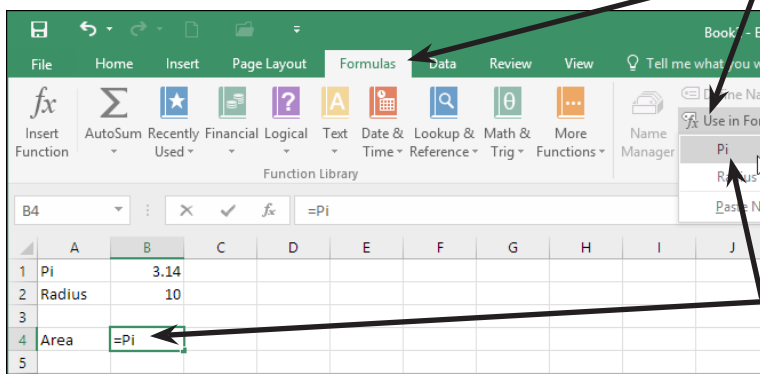


- 8 Move the cursor to cell B1 and use the DECREASE DECIMAL button in the HOME tab of the RIBBON to reduce the decimal places to 2.

Entering Formulas Using Names

We will enter a formula to calculate the area of a circle using cell names, that is: Pi times Radius squared.

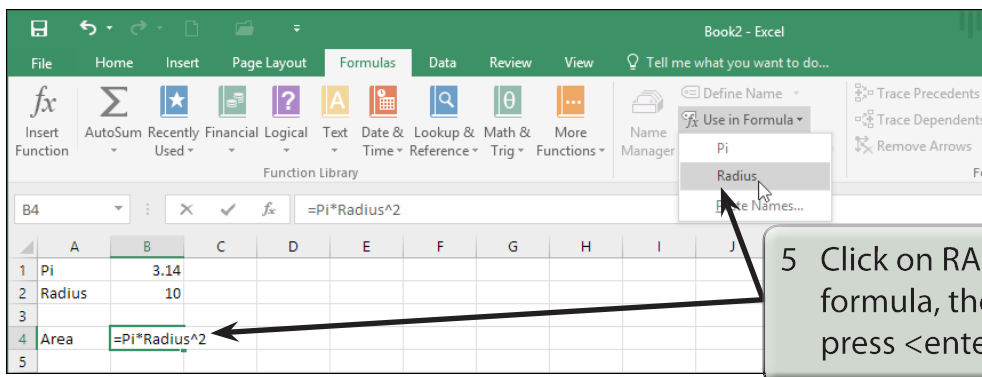
- 1 Position the cursor at cell B4 and press the = key.



2 In the FORMULAS tab of the RIBBON click on the USE IN FORMULA icon. On the Macintosh system, use the INSERT menu - NAME - PASTE.

3 The two names you entered should appear. Click on Pi and Pi will be added to the formula.

- 4 Enter: * then click on the USE IN FORMULA icon (or INSERT menu - NAME - PASTE) again.



5 Click on RADIUS to add it to the formula, then enter: ^2 and press <enter> or <return>.

- NOTE:**
- i The ^ (SHIFT+6) stands for 'raised to the power of'.
 - ii You could have typed in the names directly without using the USE IN FORMULA icon, if you prefer to do things that way.

Naming Groups of Cells

Cell names can refer to single cells or to blocks of cells. The following activity will demonstrate how to name groups of cells. It will name all the sales that a company makes along with its expenses, then calculate the balance.

A Loading the Template

- 1 Close the current file and click on the OPEN icon in the QUICK ACCESS TOOLBAR or from within the FILE tab or FILE menu.
- 2 Access the EXCEL 2016 SUPPORT FILES, open the CHAPTER 15 folder and load the CHAPTER 15 file, selecting YES to the READ-ONLY message.

B Naming the Cells

The screenshot shows the Excel interface with the 'Formulas' tab selected. The 'Name Manager' pane on the right shows a defined name 'Sales' with a reference to '=B6:B14'. The spreadsheet displays a table with columns A, B, C, D, E, and F. Row 2 contains 'INITIAL BALANCE' in A2 and '\$6,000.00' in B2. Row 5 contains 'SALES' in A5 and 'EXPENSES' in C5. Rows 6 through 14 contain numerical values in columns B and D. A callout box with the number '1' points to the 'Sales' name in the Name Box and the range B6:B14 in the spreadsheet, with the instruction: 'Highlight cells B6 to B14, click in the NAME BOX, enter: Sales and press <enter> or <return>.'

	A	B	C	D	E	F
1	INITIAL			FINAL		
2	BALANCE	\$6,000.00		BALANCE		
3						
4						
5		SALES		EXPENSES		
6		\$496.00		\$201.50		
7		\$582.00		\$57.45		
8		\$355.85		\$98.25		
9		\$683.00		\$157.35		
10		\$92.85		\$545.80		
11		\$432.75				
12		\$13.75				
13						
14						
15						

NOTE: The two blank cells (B13 and B14) will cater for any additional sales.

Using Macros and Buttons

Microsoft Excel allows you to record the steps that you carry out within a spreadsheet. These recordings are called MACROS and they can be played back as often as required. You can assign a shape to represent a MACRO. In this way the user of the spreadsheet can simply click on the shape (button) to run the MACRO.

Using a Simple Discount Table

To see how MACROS and BUTTONS work a simple discount system for a retail store will be set up. It offers discounts of 5%, 10% or no discount at all depending on the time of year.

A Opening a Sample File

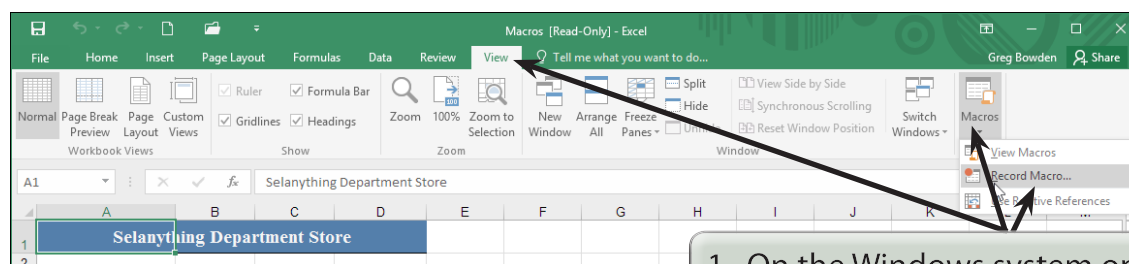
- 1 Load Microsoft Excel or close the current file.
- 2 Click on the OPEN icon in the QUICK ACCESS TOOLBAR or from within the FILE tab or menu, access the CHAPTER 16 folder of the EXCEL 2016 SUPPORT FILES, load the file:

Macros

and select YES to the READ-ONLY dialogue box.

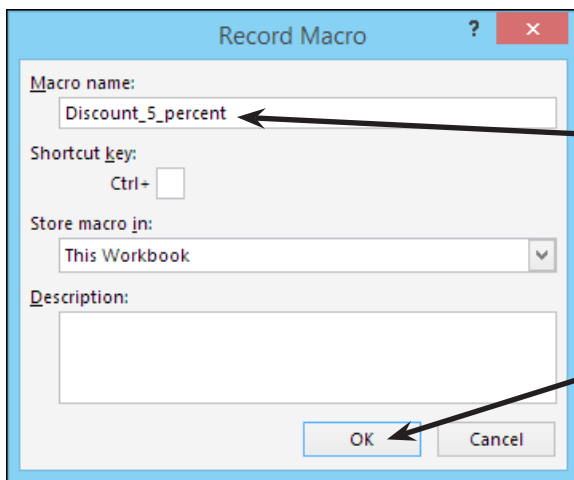
B Setting a 5% Discount Macro

The first macro will add 5% discount in the DISCOUNT ALLOWED column.



- 1 On the Windows system open the VIEW tab in the RIBBON, click on the arrow at the base of the MACROS icon and select RECORD MACRO.

- 2 On the Macintosh system open the VIEW tab and click on the RECORD MACRO icon.

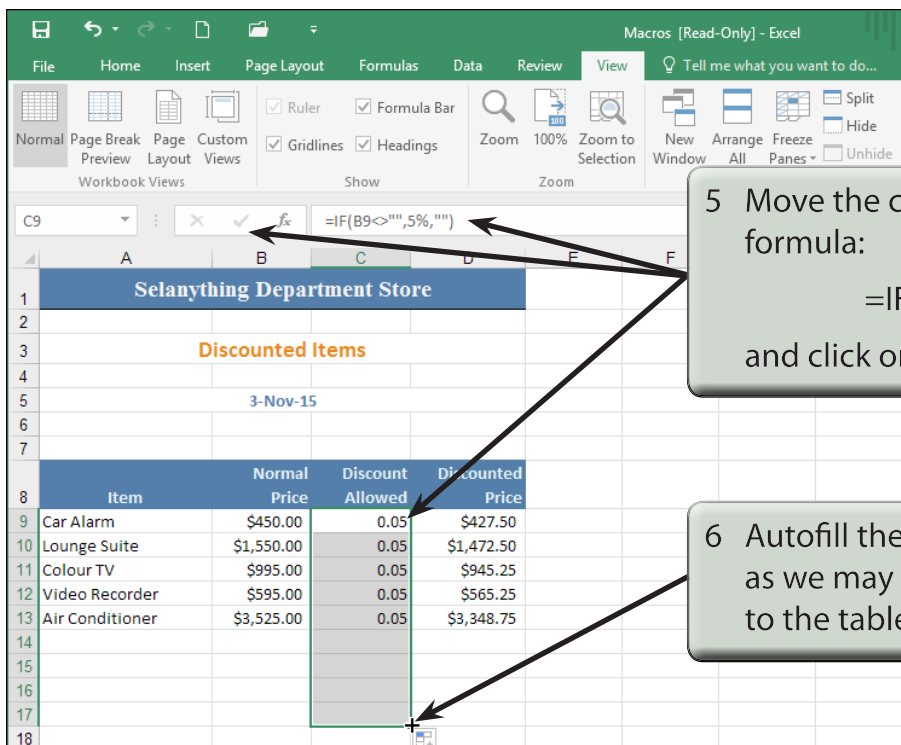


3 In the MACRO NAME box of the RECORD MACRO dialogue box enter:

Discount_5_percent

4 Click on OK and the recording will commence.

NOTE: MACRO names cannot have spaces or contain mathematical symbols such as %, *, etc.



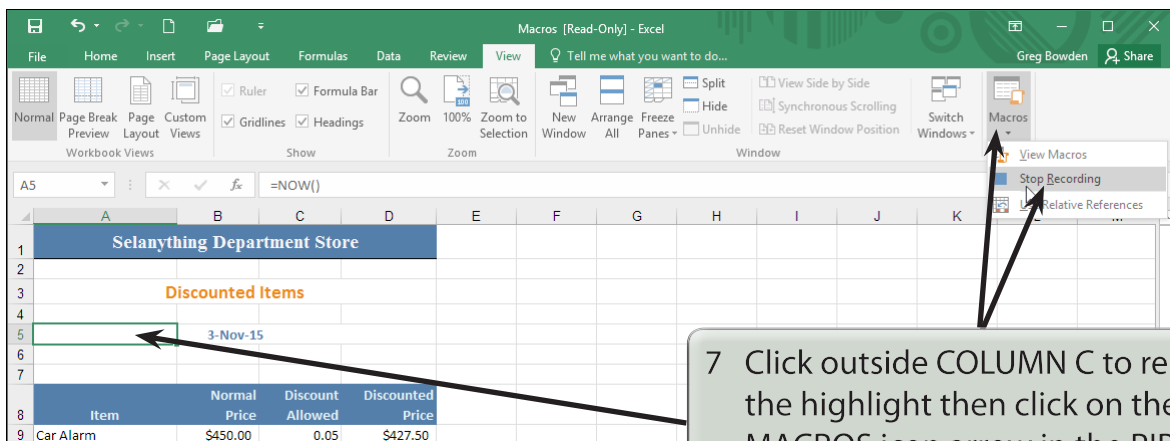
5 Move the cursor to cell C9, enter the formula:

=IF(B9<>""",5%,"")

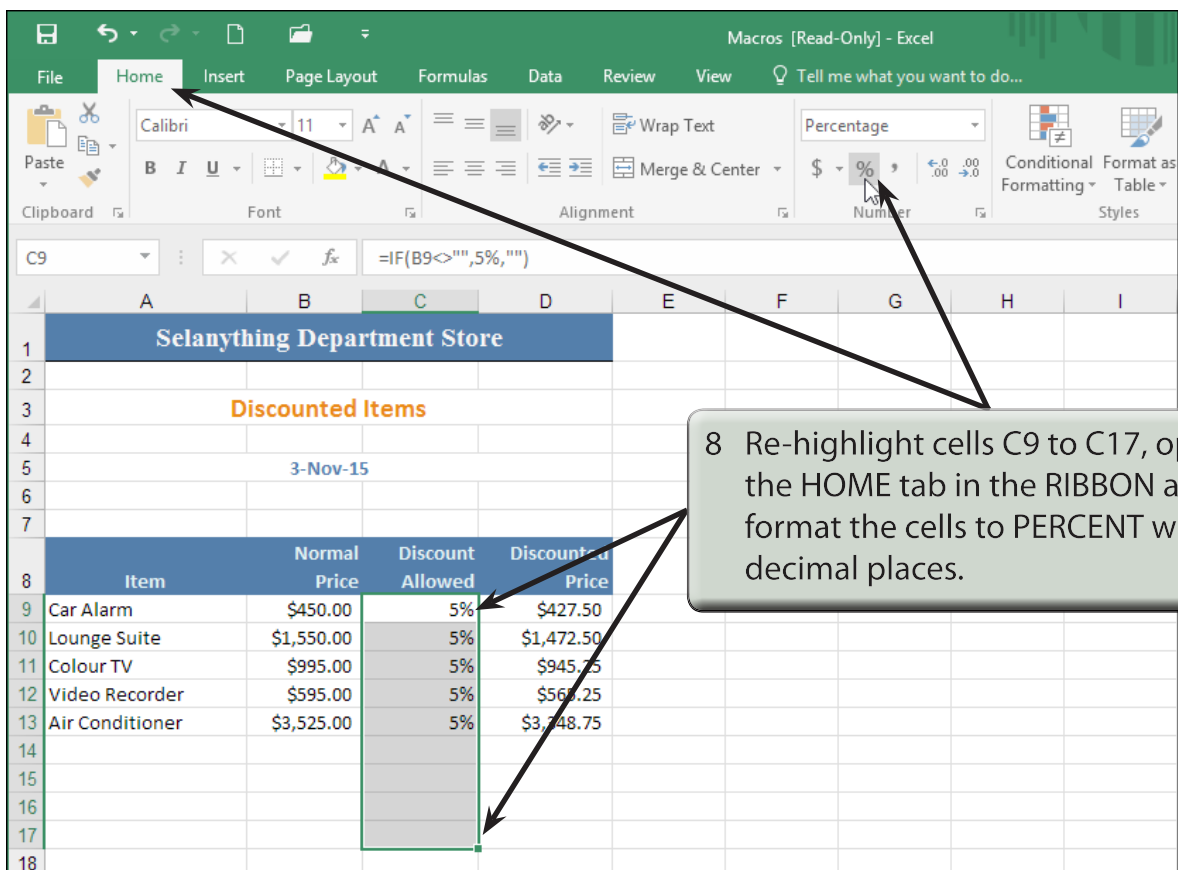
and click on the ENTER button.

6 Autofill the formula down to cell C17 as we may want to add more items to the table at a later date.

NOTE: The formula looks to see if there is an entry in the cell to the left of the DISCOUNT ALLOWED column. If there is, 5% is entered, otherwise a blank space is inserted.



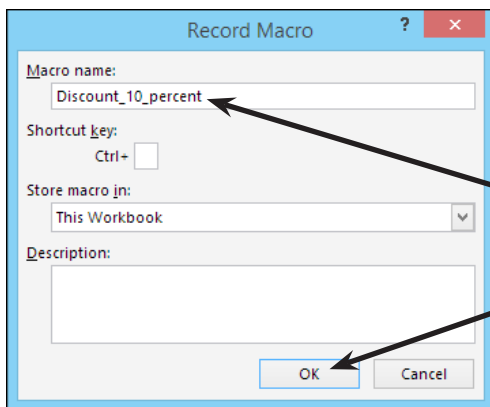
NOTE: On the Macintosh system a STOP RECORDING button is added to the VIEW tab of the RIBBON.



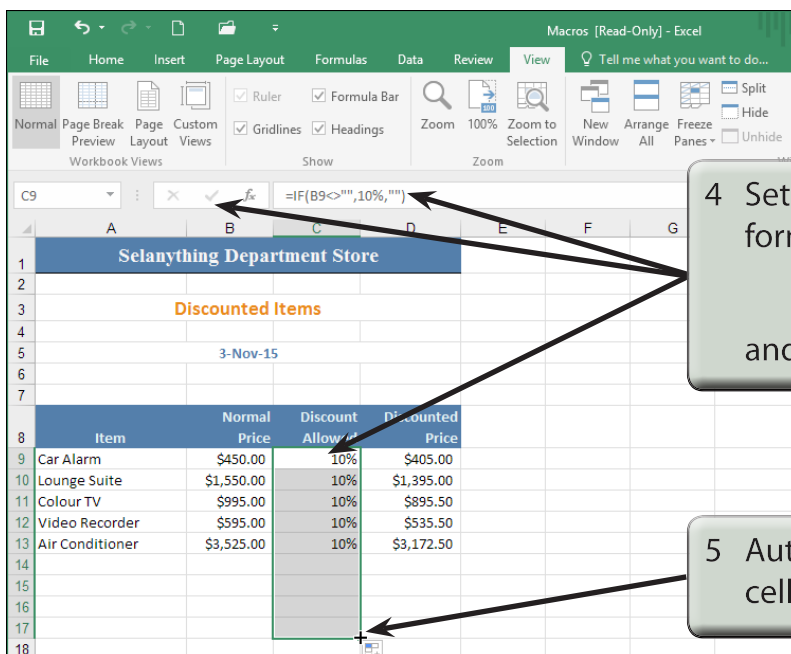
C Setting a 10% Discount Macro

A second macro to set a discount of 10% will be created in the same way to the previous macro.

- 1 Position the cursor at any cell other than cell C9.
- 2 Open the VIEW tab in the RIBBON, click in the arrow at the base of the MACROS icon and select RECORD MACRO (or click on the RECORD MACRO button).



- 3 Name the macro:
Discount_10_percent
and select OK to commence the recording.



- 4 Set the cursor at cell C9, enter the formula:
=IF(B9<>"",10%,"")
and click on the ENTER button.

- 5 Autofill the formula from cell C9 to cell C17.

NOTE: A discount of 10% should now be applied to all the items.

Payroll Systems

Companies can use Microsoft Excel to keep pay details. In this activity you will create a company payroll table and pay advice slips for the individual employees. The data for the payroll system has been prepared for you, your task will be to complete the formulas.

Loading the Payroll Template

- 1 Load Microsoft Excel or close the current file.
- 2 Click on the OPEN icon in the QUICK ACCESS TOOLBAR or from within the FILE tab or FILE menu. Access the CHAPTER 17 folder of the EXCEL 2016 SUPPORT FILES and load the template:

Payroll

Selecting YES to the READ-ONLY dialogue box.

- 3 There are two worksheets in the workbook. Look over the PAYROLL sheet which will show the pay details for all employees. Click on the PAY ADVICE sheet. It will display the pay details for an individual employee. The employee would receive the PAY ADVICE printout when they receive their pay.
- 4 Save the workbook in your STORAGE folder under the file name:

Evesalon Payroll

Remembering to turn off the READ-ONLY RECOMMENDED option.

Completing the Payroll Worksheet

The first sheet is the payroll sheet showing the pay details for all the employees of the company.

- 1 Ensure that the PAYROLL worksheet is on the screen.
- 2 Position the cursor at cell G12. We need to calculate the OVERTIME RATE OF PAY which is 1.5 times the NORMAL PAY RATE.

3 In cell G12 enter the formula:
= E12 * 1.5

4 Autofill the formula down for the other employees.

	CODE	EMPLOYEE	OCCUPATION	NORMAL HOURS	NORMAL PAY RATE	OVERTIME HOURS	OVERTIME RATE	GROSS PAY	SUM
12	Mic50	Eve Michaelson	Manager	40	\$18.00	5	\$27.00		
13	Lom50	Brenda Lomas	Hairdresser	35	\$15.00	0	\$22.50		
14	Lom51	Julia Lombardi	Hairdresser	35	\$15.00	8	\$22.50		
15	Kno50	Brian Knowles	Hairdresser (app)	35	\$10.00	2	\$15.00		

- 5 The GROSS PAY is the total weekly pay earned before deductions are taken out. The NORMAL HOURS needs to be multiplied by the NORMAL PAY RATE and the OVERTIME HOURS by the OVERTIME RATE then the two results added together.

6 Move the cursor to cell H12 and enter:
= (D12*E12) + (F12*G12)

7 Autofill the formula down for the other employees.

	CODE	EMPLOYEE	OCCUPATION	NORMAL HOURS	NORMAL PAY RATE	OVERTIME HOURS	OVERTIME RATE	GROSS PAY	SUM	TAX	NET PAY
12	Mic50	Eve Michaelson	Manager	40	\$18.00	5	\$27.00	\$855.00			
13	Lom50	Brenda Lomas	Hairdresser	35	\$15.00	0	\$22.50	\$525.00			
14	Lom51	Julia Lombardi	Hairdresser	35	\$15.00	8	\$22.50	\$705.00			
15	Kno50	Brian Knowles	Hairdresser (app)	35	\$10.00	2	\$15.00	\$380.00			

NOTE: The brackets in the GROSS PAY formula are not really necessary, but they help to separate the two calculation sections and make the formula easier to understand.

- 8 The SUPERANNUATION is the amount contributed by employees each week to a retirement fund. It is usually a percentage of the employee's Gross Pay. We will use a rate of 5% here.

9 Set the cursor at cell I12 and enter:
 $= H12 * 5\%$
 then autofill the formula down for the other employees.

CODE	EMPLOYEE	OCCUPATION	NORMAL HOURS	NORMAL PAY RATE	OVERTIME HOURS	OVERTIME RATE	GROSS PAY	SUPER-ANNUATION	TAX	NET PAY
Mic50	Eve Michaelson	Manager	40	\$18.00	5	\$27.00	\$855.00	\$42.75		
Lom50	Brenda Lomas	Hairdresser	35	\$15.00	0	\$22.50	\$525.00	\$26.25		
Lom51	Julia Lombardi	Hairdresser	35	\$15.00	8	\$22.50	\$705.00	\$35.25		
Kno50	Brian Knowles	Hairdresser (app)	35	\$10.00	2	\$15.00	\$380.00	\$19.00		

The Tax Calculation

Normally the TAX is calculated through a series of lookups which you did in an earlier chapter. This could be done at the right of the payroll and set not to print when the payroll is printed. To make things a little easier we will use a base tax rate of 25%.

Set the cursor at cell J12 and enter:
 $= H12 * 25\%$
 then autofill the formula down for the other employees.

CODE	EMPLOYEE	OCCUPATION	NORMAL HOURS	NORMAL PAY RATE	OVERTIME HOURS	OVERTIME RATE	GROSS PAY	SUPER-ANNUATION	TAX	NET PAY
Mic50	Eve Michaelson	Manager	40	\$18.00	5	\$27.00	\$855.00	\$42.75	\$213.75	
Lom50	Brenda Lomas	Hairdresser	35	\$15.00	0	\$22.50	\$525.00	\$26.25	\$131.25	
Lom51	Julia Lombardi	Hairdresser	35	\$15.00	8	\$22.50	\$705.00	\$35.25	\$176.25	
Kno50	Brian Knowles	Hairdresser (app)	35	\$10.00	2	\$15.00	\$380.00	\$19.00	\$95.00	

Calculating the Net Pay

The NET PAY is the GROSS PAY minus the deductions (superannuation and tax).

Set the cursor at cell K12 and enter:

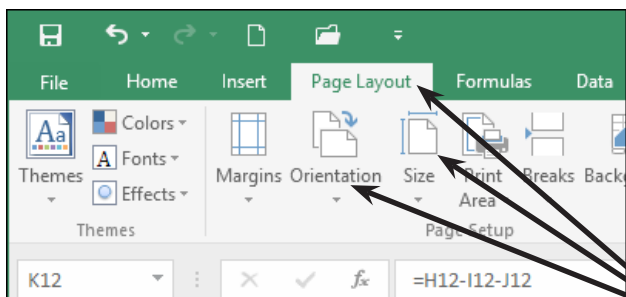
$$= H12 - I12 - J12$$

 then autofill the formula down for the other employees.

	CODE	EMPLOYEE	OCCUPATION	NORMAL HOURS	NORMAL PAY RATE	OVERTIME HOURS	OVERTIME RATE	GROSS PAY	SUPER-ANNUATION	TAX	NET PAY
12	Mic50	Eve Michaelson	Manager	40	\$18.00	5	\$27.00	\$855.00	\$42.75	\$213.75	\$598.50
13	Lom50	Brenda Lomas	Hairdresser	35	\$15.00	0	\$22.50	\$525.00	\$26.25	\$131.25	\$367.50
14	Lom51	Julia Lombardi	Hairdresser	35	\$15.00	8	\$22.50	\$705.00	\$35.25	\$176.25	\$493.50
15	Kno50	Brian Knowles	Hairdresser (app)	35	\$10.00	2	\$15.00	\$380.00	\$19.00	\$95.00	\$266.00

Printing the Payroll

The print area needs to be checked so that the whole payroll fits on one page and the ORIENTATION needs to be set to LANDSCAPE.



1 In the PAGE LAYOUT tab of the RIBBON set the ORIENTATION icon to LANDSCAPE and the SIZE icon to your printer's paper size (it is probably A4).

Financial Applications

This chapter looks at some of the ways banks make use of spreadsheets. It will include an personal banking sheet, a home loan simulator and a calculation of compound interest.

Personal Banking

A spreadsheet can be used to allow a person to keep an accurate record of their financial dealings. It might be from a bank debit card, a cheque account, etc.

A Opening the Prepared Template

- 1 Load Microsoft Excel or close the current file.
- 2 Click on the OPEN icon in the QUICK ACCESS TOOLBAR or from within the FILE tab or FILE menu. Access the CHAPTER 18 folder of the EXCEL 2016 SUPPORT FILES and load the file:

Personal Banking

Selecting YES to the READ-ONLY dialogue box.

B Completing the Formulas

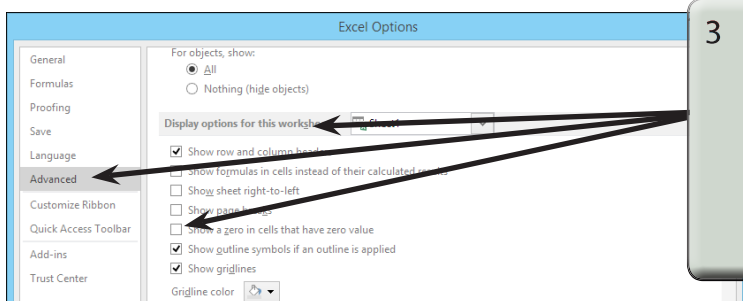
We need a formula that looks to see whether a deposit or withdrawal has been entered. If either has, then the deposit must be added to the balance or the withdrawal subtracted from the balance.

1 Enter the following formula in cell E8:
`= IF(OR(C8<>\"\",D8<>\"\"),E7 + C8 - D8,0)`

DATE	ITEM	DEPOSIT	WITHDRAWAL	BALANCE
14-Sep	Initial Balance			\$1,000.00
				\$0.00

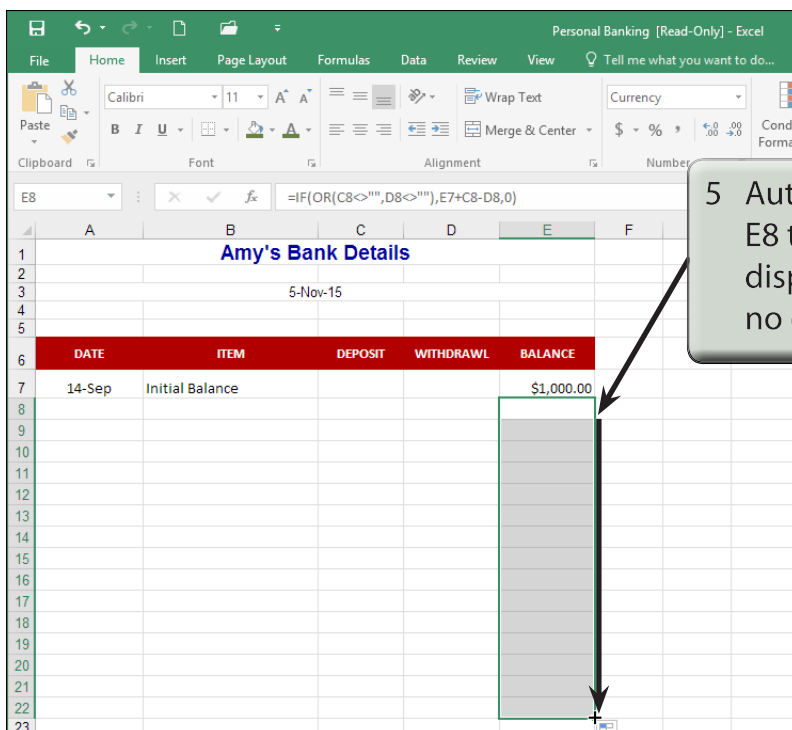
NOTE: This formula says: "If either a deposit is entered in this row, OR a withdrawal is entered in this row, then display the previous balance (one row up) plus the deposit in this row minus the withdrawal in this row, otherwise display zero."

- 2 Zero values need to be turned off. On the Windows system click on the FILE tab and select OPTIONS. On the Macintosh system display the EXCEL menu and select PREFERENCES.



- 3 On the Windows system open the ADVANCED option, scroll to the DISPLAY OPTIONS FOR THIS WORKSHEET section, turn off SHOW A ZERO IN CELLS THAT HAVE ZERO VALUE and select OK.

- 4 On the Macintosh system click on the VIEW icon, turn off ZERO VALUES and close the PREFERENCES window.



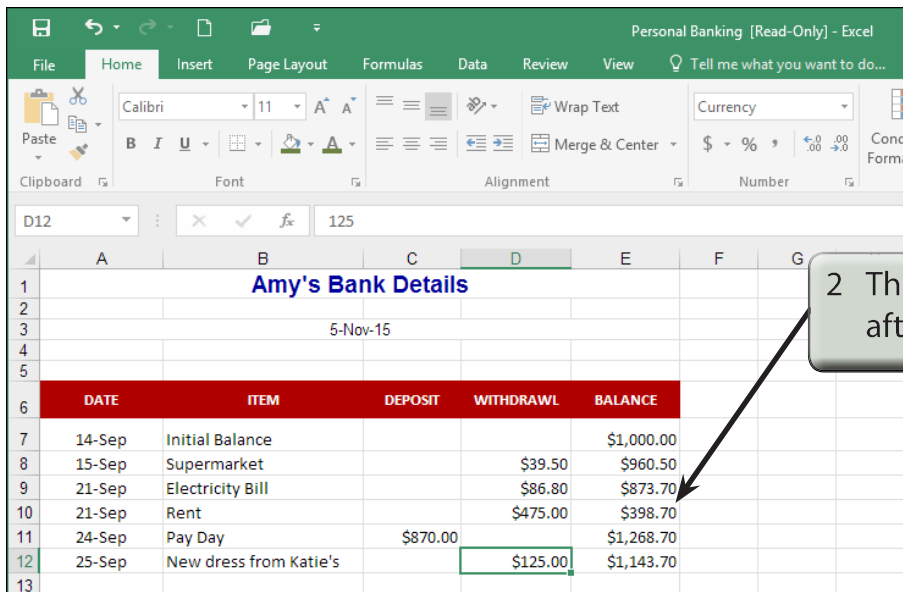
- 5 Autofill the formula down from cell E8 to cell E22. There will be nothing displayed at this stage as there are no deposits or withdrawals.

C Using the Personal Finances File

Now you are ready to use the account.

- 1 Enter the following labels and values into your worksheet (there is 1 deposit and 4 withdrawals):

Date	Item	Deposit	Withdrawal
15 Sep	Supermarket		\$39.50
21 Sep	Electricity Bill		\$86.80
21 Sep	Rent		\$475.00
24 Sep	Pay Day	\$870.00	
25 Sep	New dress from Katie's		\$125.00



DATE	ITEM	DEPOSIT	WITHDRAWAL	BALANCE
14-Sep	Initial Balance			\$1,000.00
15-Sep	Supermarket		\$39.50	\$960.50
21-Sep	Electricity Bill		\$86.80	\$873.70
21-Sep	Rent		\$475.00	\$398.70
24-Sep	Pay Day	\$870.00		\$1,268.70
25-Sep	New dress from Katie's		\$125.00	\$1,143.70

2 The Balance should adjust after each entry.

- 3 Try adding some more withdrawals and deposits of your own.
- 4 Save your workbook and print a copy if your teacher requires you to.

The Home Loan Simulator

Many banks have home loan tables set up so that prospective borrowers can be shown what their repayments will be. We can use Microsoft Excel to set up a loan simulator of our own. Such tables are called LOAN AMORTIZATION tables. For simplicity we will just create a table for monthly repayments.

A Opening the Prepared Template

- 1 Close the current file and click on the OPEN icon in the QUICK ACCESS TOOLBAR or from within the FILE tab or FILE menu.
- 2 Access the CHAPTER 18 folder of the EXCEL 2016 SUPPORT FILES and load the file:
Home Loan
Selecting YES to the READ-ONLY dialogue box.

B Entering the Initial Values

The values in the PRINCIPAL, INTEREST RATE and YEARS OF LOAN section control the spreadsheet. They are the only values that need to be entered and the table will be set up so that when different values are entered the table automatically adjusts.

1 Move the cursor to cell C4 and enter: \$10000

2 In cell C5 enter: 7% and in cell C6 enter: 2

MONTH	START BALANCE	END BALANCE	MONTHLY PAYMENT	PRINCIPAL REMAINING	TOTAL PAID
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					

NOTE: For simplicity we will use a 2-year loan. Normally a home loan would be for a much higher Principal than this and be paid back over many more years.

Date Calculations

In this chapter you will look at some spreadsheet applications that involve doing calculations on dates. It will involve more detailed IF statements. You will complete prepared templates for a library book overdues system and a debt collection company.

Creating a Library Book Overdue System

A school library needs a simple overdue books table. It should calculate automatically the return date and any overdue fees that need to be charged on borrowed books. Three weeks is the borrowing period after which 5 cents is charged for each day the book is overdue. All the librarian should need to do is enter the Borrow Date, the book's Accession Number and the student's name, after which the overdue list should complete itself.

Opening the Prepared Template

- 1 Load Microsoft Excel or close the current file.
- 2 Click on the OPEN icon in the QUICK ACCESS TOOLBAR or from within the FILE tab or FILE menu. Access the CHAPTER 19 folder of the EXCEL 2016 SUPPORT FILES and load the file:

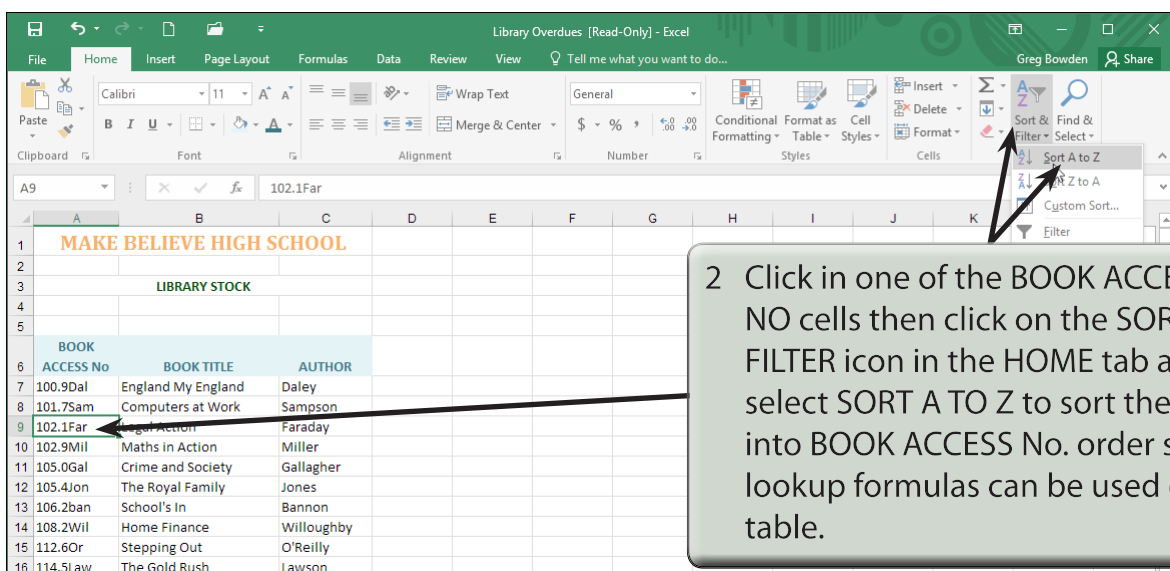
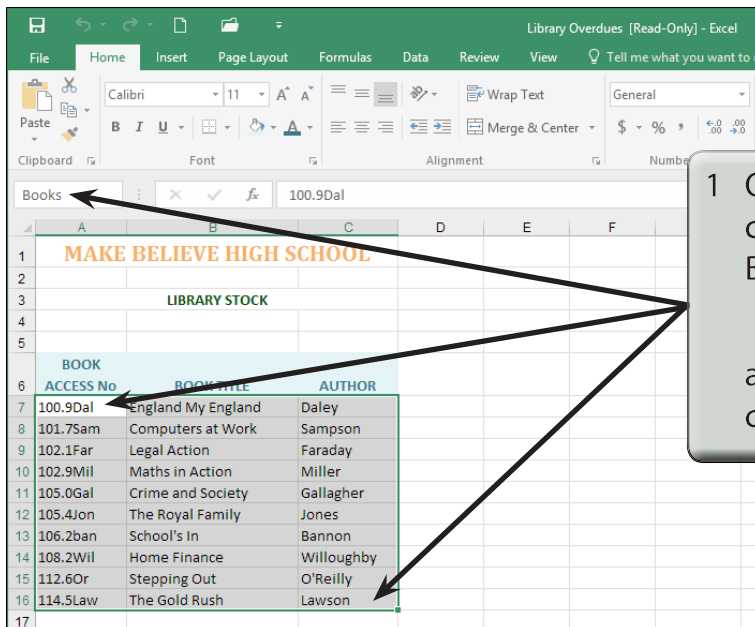
Library Overdues

Selecting YES to the READ-ONLY dialogue box.

- 3 The template has two worksheets:
 - the OVERDUES sheet, which will keep track of which books are overdue.
 - The BOOK LIST sheet, which is a list of the books that the school has.
- 4 Look at both worksheets.

Naming the Book List

To make the formulas easier to understand the Book List should be named



3 Save the file in your STORAGE folder as:

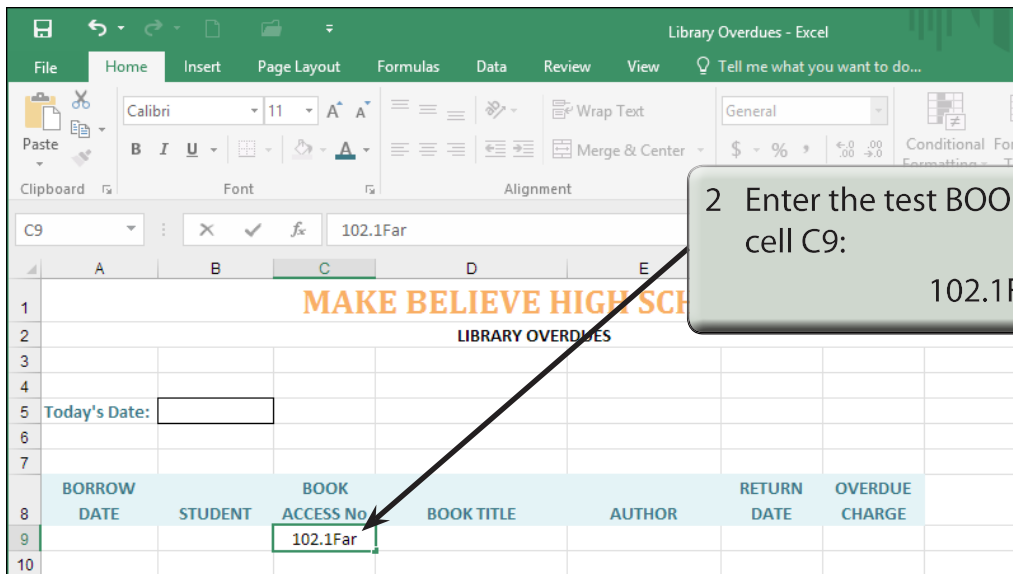
Library Overdues

Remembering to turn off READ-ONLY RECOMMENDED.

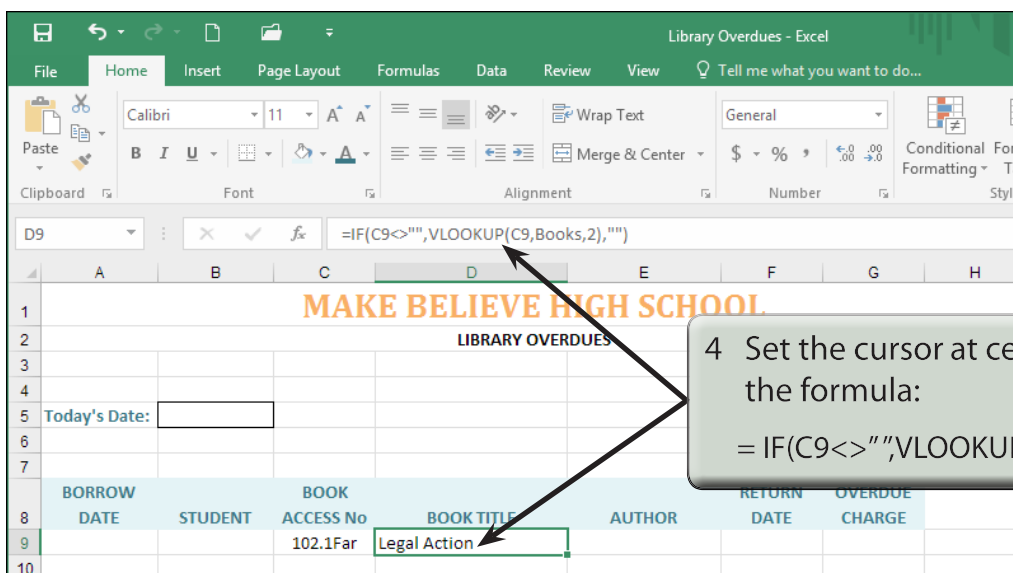
Looking up the Book Title and Author

The BOOK TITLE and AUTHOR can be inserted into the OVERDUES sheet using the VLOOKUP command.

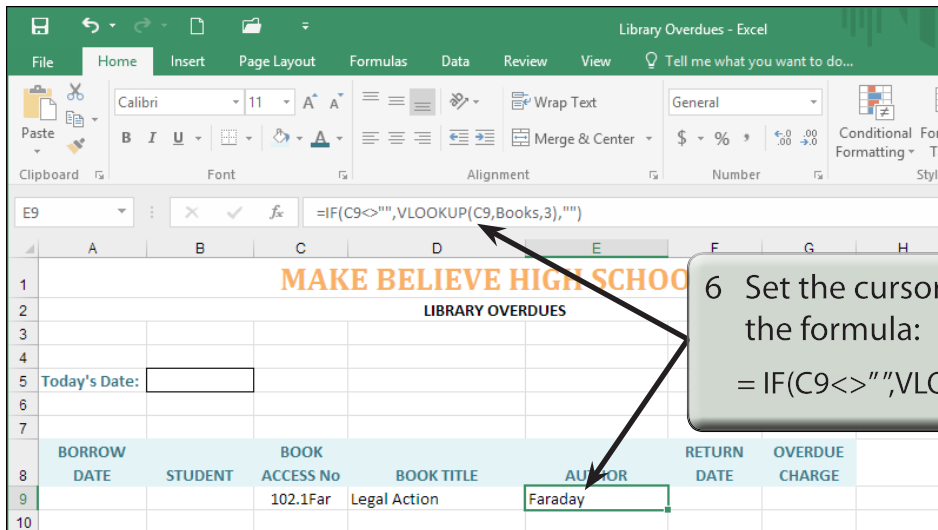
- 1 Return to the OVERDUES worksheet.



- 3 The Book Title is found by a formula that checks whether a book accession number has been entered, then looks up the BOOKS table and displays the Book Title (COLUMN 2), otherwise a blank cell is displayed.

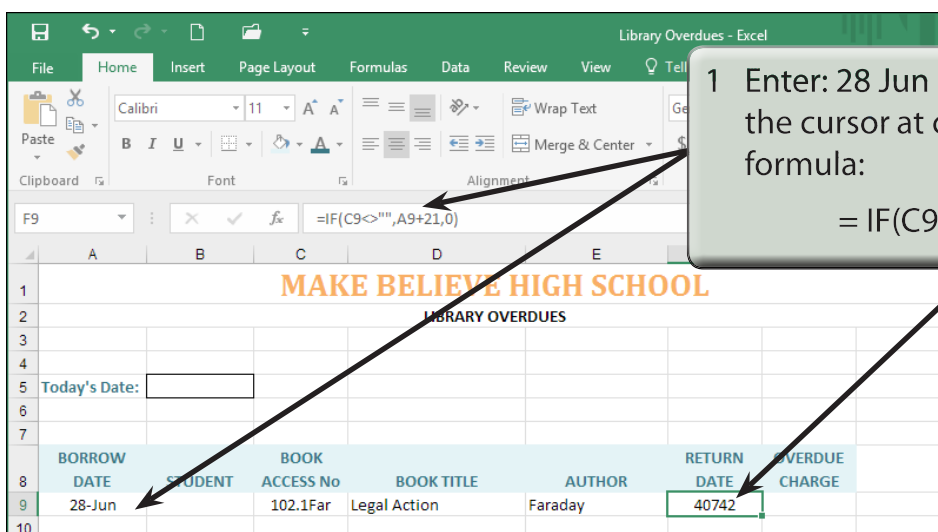


- The Book Author is obtained through a similar formula to the Book Title, except that COLUMN 3 is used.



Calculating the Return Date

The RETURN DATE is calculated if an accession number has been entered. It is the BORROW DATE plus 21.



NOTE: Because the result is a calculation, 0 is used instead of "" in the OTHERWISE section of the IF formula.

Pivot Tables

Pivot Tables allow spreadsheet data to be summarised into reports similar to those created in database programs such as Microsoft Access and FileMaker Pro. Within the spreadsheet data the columns become the fields of the database and the rows become the individual records.

There are three types of fields (columns) in a Pivot Table:

- | | |
|-------------------------|---|
| Category Fields | which contain data that can be grouped together, for example, Departments of a business. |
| Data Fields | which contain numerical data on which calculations such as sum or average can be applied. |
| Arbitrary Fields | which contain general data that cannot be grouped or have calculations applied to it, for example, a person's first name. |

Loading the Prepared Data

The sales data for a month for an online store that sells products over the internet has been prepared for you and summaries of the data are required.

- 1 Load Microsoft Excel or close the current file.
- 2 Click on the OPEN icon in the QUICK ACCESS TOOLBAR or from within the FILE tab or FILE menu.
- 3 Access the CHAPTER 20 folder of the EXCEL 2016 SUPPORT FILES and load the file:

Selanything Sales

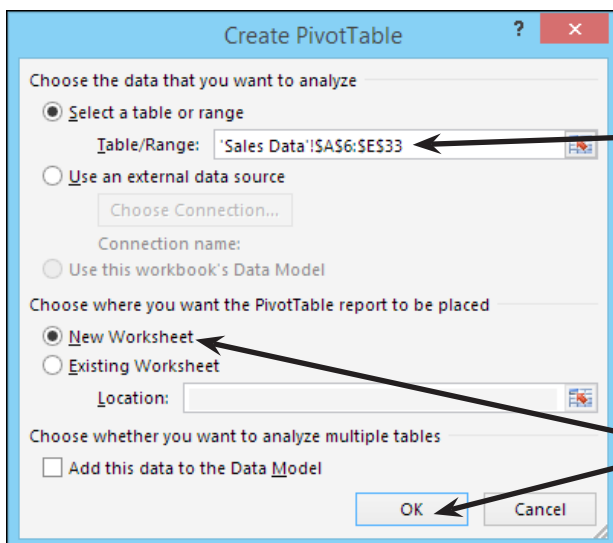
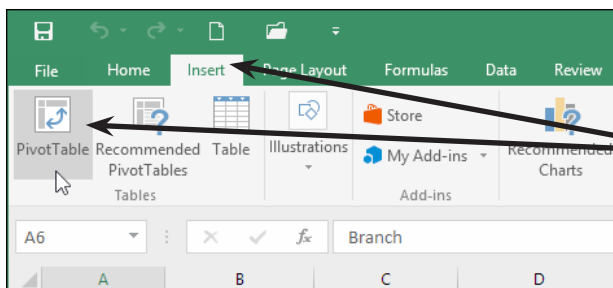
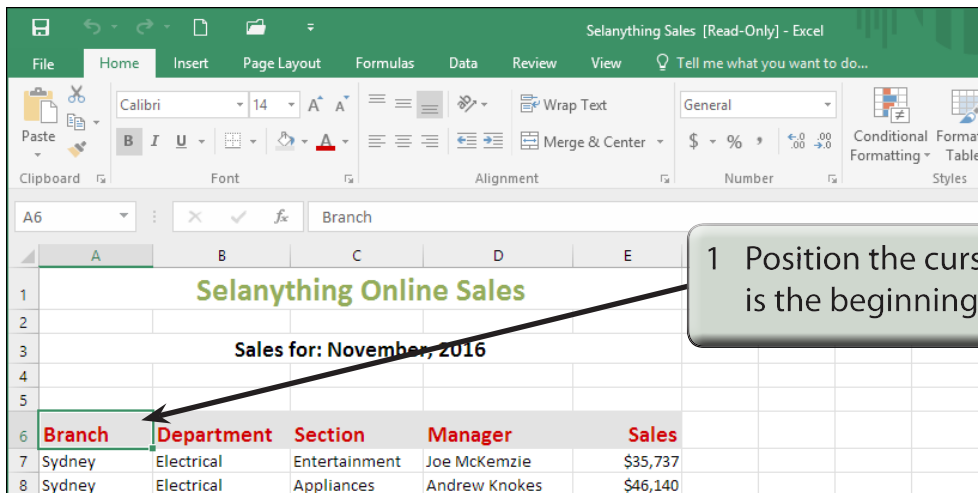
Selecting YES to the READ-ONLY dialogue box.

- 4 Look through the data to familiarise yourself with it. There are three Branches and, within each branch, there are 4 Departments with sections within each Department. The figures show the total sales for a month for each section.

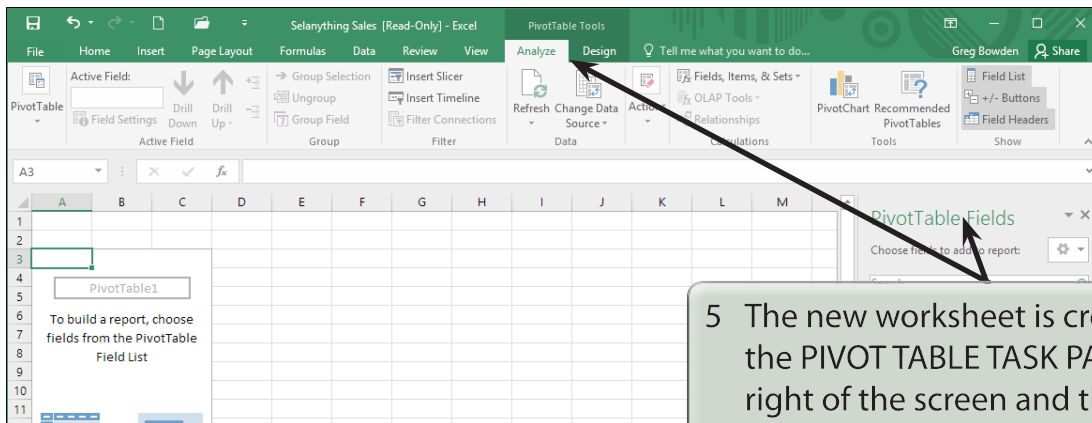
Creating a Pivot Table

A Pivot Table will be used to summarize the sales for the month.

A Setting Up the Pivot Table



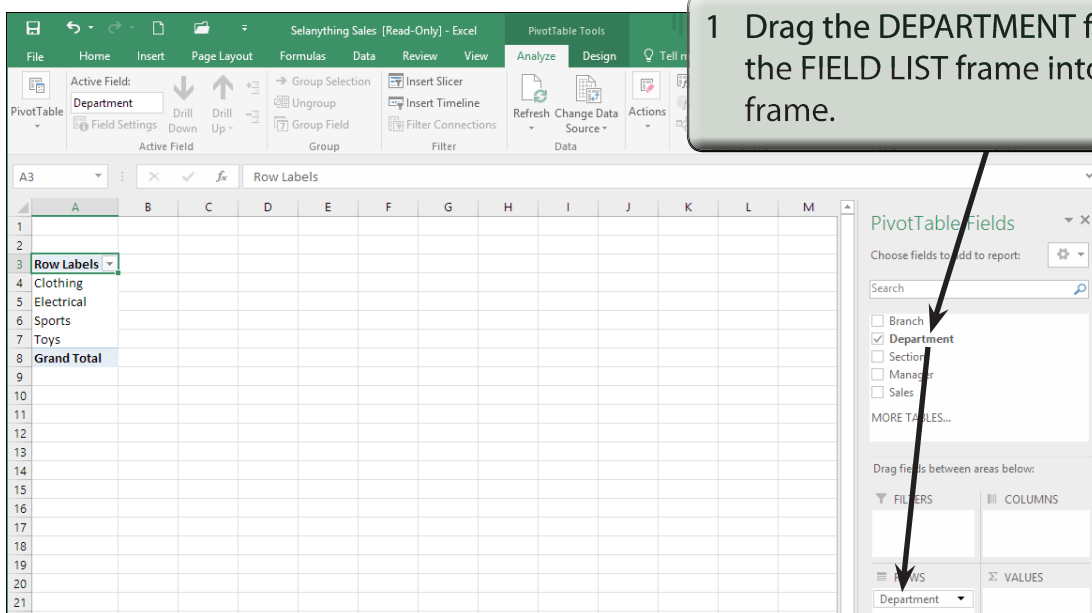
NOTE: When setting up a spreadsheet that will have Pivot Tables created from it, it is best to have no blank rows or columns. If there are blank rows or columns, the Pivot Table wizard will only select the data up to the blank row or column.



5 The new worksheet is created with the PIVOT TABLE TASK PANE at the right of the screen and the ANALYZE and DESIGN tabs of the PIVOT TABLE TOOLS are added to the RIBBON.

B Inserting the Rows, Columns and Data

The Pivot Table is created by placing fields in the frames at the base of the PIVOT TABLE FIELDS pane. Let's set the Departments to be down the left of the report, the Branches across the top and the Sales to be the data within the Pivot Table.



1 Drag the DEPARTMENT field from the FIELD LIST frame into the ROWS frame.

2 Drag the BRANCH field from the FIELD LIST frame into the COLUMNS frame.

The screenshot shows the Excel interface with a PivotTable. The PivotTable Fields task pane on the right has 'Branch' selected in the 'COLUMNS' area. The PivotTable in the worksheet shows 'Branch' as column labels and 'Department' as row labels.

Row Labels	Brisbane	Melbourne	Sydney	Grand Total
Clothing				
Electrical				
Sports				
Toys				
Grand Total				

3 Drag the SALES field from the FIELD LIST frame into the VALUES frame.

The screenshot shows the Excel interface with a PivotTable. The PivotTable Fields task pane on the right has 'Sales' selected in the 'VALUES' area. The PivotTable in the worksheet shows 'Sum of Sales' as values.

Sum of Sales	Column Labels			
Row Labels	Brisbane	Melbourne	Sydney	Grand Total
Clothing	46735	46735	38507	131977
Electrical	72118	72118	81877	226113
Sports	56769	56769	52248	165786
Toys	15767	15767	14469	46003
Grand Total	191389	191389	187101	569879

4 The summary table is created showing the sales for each Department within each Branch and Grand Totals are provided for the DEPARTMENT and BRANCH sales.

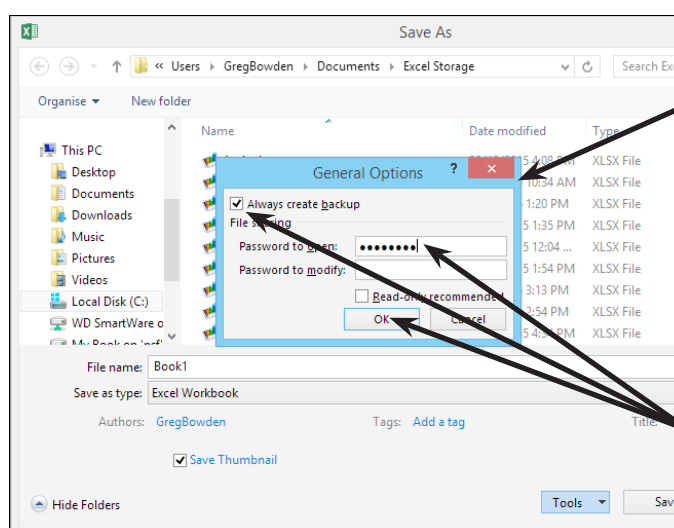
Useful Tools

Microsoft Excel has a number of useful tools that help support the spreadsheet's operations. This chapter will look at a few of them. There will be no Assignment at the end of the chapter, instead there is a project that can be attempted to practice your spreadsheet skills.

The Save Options

The SAVE OPTIONS can be used to instruct Excel to make a backup copy of the file each time it is saved, or to add password protection to the file.

- 1 Load Microsoft Excel or close the current document and start a new BLANK WORKBOOK.
- 2 Enter a few labels and values into a worksheet.
- 3 Click on the FILE tab or menu, select SAVE AS and access your STORAGE folder.



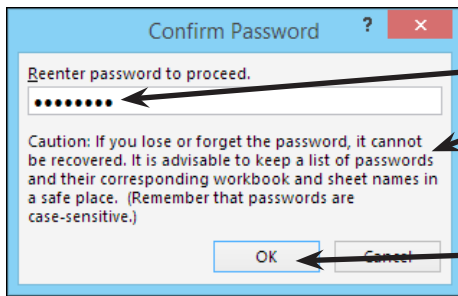
- 4 In the SAVE AS dialogue box click on the TOOLS button and select GENERAL OPTIONS (or select OPTIONS on the Macintosh) to open the GENERAL OPTIONS dialogue box.

- 5 On the Windows system click on the ALWAYS CREATE BACKUP check box then on both systems click in the PASSWORD TO OPEN box, enter:

security

and select OK.

- NOTE:**
- i The password will be displayed as bullets so that no-one else can see your entry.
 - ii You can also set a password to modify the file. In that case no-one would be able to change the file unless the password was entered.

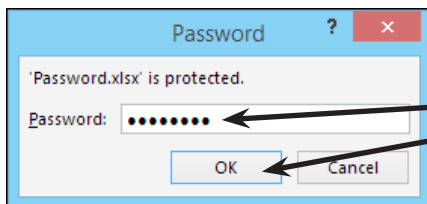


6 Read the important note about passwords then re-enter the password to ensure that you have entered it correctly.

7 Click on OK to return to the SAVE AS dialogue box.

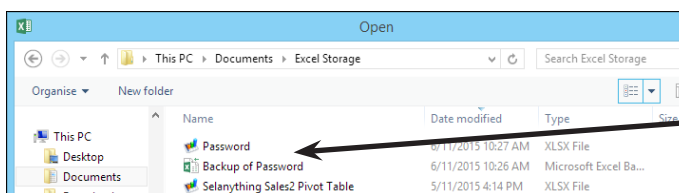
8 Enter the file name: **PASSWORD** and save the file in your **STORAGE** folder.

9 Close the file then re-open it. You will be asked to enter the password.



10 Enter: **security** and click on OK.

11 On the Windows system add some more labels or values to your worksheet and click on the **SAVE** button in the **QUICK ACCESS TOOLBAR** to update the file.



12 Click on the **FILE** tab and select **OPEN**. Access your **STORAGE** folder and you now have two copies of the file, **PASSWORD** and **BACKUP OF PASSWORD**.

NOTE: You can sort your **STORAGE** folder into **DATA MODIFIED** order to view the latest files next to each other.

13 Open the **BACKUP OF PASSWORD** file. On the Macintosh system proceed to the note about passwords on the next page.