



Microsoft Excel 2016

Using as a Database

INFOCUS COURSEWARE

Designed to fast-track you through the process of learning about computers and information technology, the *In Focus* range is a unique and innovative concept in learning.

A quick reference summary of key procedures is provided at the bottom of each page together with handy tips and additional information.

Each title in the *In Focus* series can be used as:

- a classroom workbook for instructor-led teaching and training;
- a self-study guide for self-paced learning;
- a tutorial guide for distance education programs;
- a resource collection of just-in-time support and information for help desk users and support staff;
- a handy, desk-side reference for computer users.

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Microsoft Excel 2016
Using as a Database

MICROSOFT EXCEL 2016

USING AS A DATABASE

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READ ME FIRST

In case you're not familiar with the terminology, *Read Me First* is quite often the name given to a computer file that contains important information for people to know prior to using an application.

This section contains some important information to help you use this book so we thought we'd start with a *Read Me First* section.

What skills and knowledge you will acquire...

The skills and knowledge acquired in Microsoft Excel 2016 - Using as a Database are sufficient to be able to use and operate the software effectively.

What you'll need to know before beginning this course...

Microsoft Excel 2016 - Using as a Database assumes little or no knowledge of the software. However, it would be beneficial to have a general understanding of personal computers and the Windows operating system environment.

The objectives of this guide...

At the completion of this course you should be able to:

- sort data in a list in a worksheet
- use a variety of data validation techniques
- use a range of find and replace techniques
- filter data in a table
- use advanced filters to analyse data in a list
- apply conditional formatting to ranges in a worksheet
- use a range of text functions
- understand and create simple **PivotTables**
- construct and operate **PivotTables** using some of the more advanced techniques
- create and edit a **PivotChart**

What you get in a chapter...

Each chapter begins with a summary page listing the topics covered in that chapter. The chapter then consists of single-page topic sheets pertaining to the theme of the chapter.

What you'll need to have before commencing this course...

Many of the topics in this learning guide require you to open an existing file with data in it. These files can be obtained from your instructor and need the product code for this course which is ExcelAsaDataBase.

As you work through this guide...

It is strongly recommended that you close all open files, if any, prior to commencing each new chapter in this learning guide. Each chapter, where relevant, has its own set of exercise files and any from a previous chapter are no longer required.

Where to from here...

Have a look at the next page which explains how a topic page works, ensure that you have access to the exercise files (see above), and you're ready to make a start.

WORKING WITH TOPIC SHEETS

The majority of this book comprises single-page topic sheets. There are two types of topic sheets: **task** and **reference**. The layout of both is similar – an *overview* at the top, *detail* in the centre and

additional reference (optional) material at the bottom. *Task* sheets contain a *Try This Yourself* step-by-step exercise panel in the detail area as shown below.

Word Processing Simple Documents

1 **OPENING A DOCUMENT**

Although there are a number of different ways to open a Word file, which include using the **Start** menu or clicking directly on an icon of the file, perhaps the best and simplest way to do it is from within the Word program itself using the **File > Open** command. The **Open** dialog box has tools that help you to identify file types and location.

3 **Try This Yourself:**

Before you begin ensure that *Word 2000* has started.

- 1 Select **File > Open** to display the **Open** dialog box.
- 2 Click on the drop arrow for **Look in** to display a list of possible locations available to your computer where documents may be found.
- 3 Click on **Drive C (C:)** or its equivalent on your computer.
- 4 The contents of drive C: will now be displayed in the **Open** dialog box...
- 5 Double-click on **Course Files For Word 2000** – this is the folder where files for this course can be found.
- 6 The contents of the folder **Course Files For Word 2000** will now be displayed...
- 7 Click on **W002 Document Essentials_1.doc** to select it as the file that you wish to open, then click on **[Open]** to open the document on the screen.

2

4

6

5 **For Your Reference...**

To open a document in Word:

1. Select **File > Open** to display the **Open** dialog box.
2. Locate the file and folder (if necessary)
3. Click on **[Open]**

6 **Handy to Know...**

There is more than one way to open a document in Word. Alternatively you could:

- Click on the **Open** tool
- Select a recently opened file from the **File** menu.

Skillgate Learning Centres Page 10 Chapter 2: Working With A Document

- 1 Topic name
- 2 General topic overview provides an introduction to the topic
- 3 *Try This Yourself* (*Task*-based topic sheets) is a detailed step-by-step practice exercise for you to work through. In *Reference* topic sheets this is usually replaced by a box with reference information.
- 4 In *Task* topic sheets screen shots and graphics provide a visual clue as to what will happen when you work through the *Try This Yourself* practice exercise. In *Reference* topic sheets the screen shots and graphics are used to visually represent information and concepts.
- 5 The *For Your Reference* (optional) element provides a quick summary of the steps required to perform a task. These usually only appear in *Task*-based topic sheets.
- 6 The *Handy To Know* (optional) element provides additional information such as alternate ways of accomplishing a task or further information providing handy tips.

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NOTES:



CHAPTER 1 SORTING DATA

InFocus

Microsoft Excel allows you to **sort** worksheet data alphabetically, numerically or chronologically. You can sort your data by columns, starting from the highest value working down to the lowest (descending), or from the lowest value working up to the highest (ascending). **Sorting** data can help to analyse trends in sales, or target areas in business, and also to make comparisons between data.

In this session you will:

- ✓ gain an understanding of sorting and lists in **Excel**
- ✓ learn how to sort alphabetical data in a list
- ✓ learn how to sort numbers
- ✓ learn how to sort on more than one column
- ✓ learn how to sort numbered lists
- ✓ learn how to sort a list by rows.

UNDERSTANDING LISTS

Microsoft Excel is quite often used to create **lists** – such as lists of customer contacts, lists of items in an inventory, lists of employees, lists of upcoming events, and the like. To cater for these

kinds of lists, Microsoft Excel allows you to perform **sort** operations so that all of the data in the list can be rearranged in a more desirable and logical fashion.

Lists – The Key to Understanding Sorting

To understand how Microsoft Excel performs a sorting operation you first need to grasp the concept of a **list** in Microsoft Excel.

When you make a cell active Excel analyses all of the adjacent cells – up, down, left and right. It considers all of the cells around the active cell to be part of a list range as long as the cells contain data.

So, in Excel, a list is automatically defined as the area around the active cell that contains data. The boundary of the list range is defined when an empty cell is encountered. In the example below, the active cell is **C4**. Excel therefore deems the list to be the one bounded by empty cells – in other words, the list is made up of all of the non-empty cells.

	A	B	C	D	E	F	G	H
1	Alpheius Leader Listing							
2	Staff Listing							
3								
4	No	First Name	Last Name	Position	Office	E-Mail	Telephone	
5	NZ0000001	Peter	Reynolds	Enterprise Leader	Auckland	preynolds@alpheiusge.com.nz	64 9 344 0219	
6	NZ0000002	Mary	Campbell	Effective People Leader	Auckland	mcampbell@alpheiusge.com.nz	64 9 344 0202	
7	NZ0000003	Helen	Kai	Monies Leader	Auckland	hkai@alpheiusge.com.nz	64 9 344 0203	
8	NZ0000004	Norris	Maunga	Forward Thinking Leader	Auckland	nmaunga@alpheiusge.com.nz	64 9 344 0204	
9	NZ0000005	Vivian	Smith	Enterprise Opportunities Leader	Auckland	vsmith@alpheiusge.com.nz	64 9 344 0205	
10	NZ0000006	Grace	Goodson	Communications Service Leader	Auckland	ggoodson@alpheiusge.com.nz	64 9 344 0206	
11	NZ0000007	Kate	Rualowy	Insurance Service Leader	Auckland	krualowy@alpheiusge.com.nz	64 9 344 0207	
12	NZ0000008	Brian	Houson	Banking and Finance Service Leader	Auckland	bhouson@alpheiusge.com.nz	64 9 344 0208	
13	NZ0000009	Tara	Kinelly	Legal Service Leader	Auckland	tkinelly@alpheiusge.com.nz	64 9 344 0209	
14	NZ0000010	Nora	Mita	Building Services Service Leader	Auckland	nmita@alpheiusge.com.nz	64 9 344 0210	
15	NZ0000011	Kris	Tamahori	Careers and Education Service Leader	Auckland	ktamahori@alpheiusge.com.nz	64 9 344 0211	
16	NZ0000012	Kelly	Jones	Health Services Service Leader	Auckland	kjones@alpheiusge.com.nz	64 9 344 0212	
17	NZ0000013	Arthur	Maohori	Communications Product Leader	Auckland	amaohori@alpheiusge.com.nz	64 9 344 0213	
18	NZ0000014	Marama	Takarami	Electronics Product Leader	Auckland	mtakarami@alpheiusge.com.nz	64 9 344 0214	
19	NZ0000015	Samuel	Jenkins	Computer Products Product Leader	Auckland	sjenkins@alpheiusge.com.nz	64 9 344 0215	
20	NZ0000016	Hine	Boramori	Vehicles Product Leader	Auckland	hboramori@alpheiusge.com.nz	64 9 344 0216	
21	NZ0000017	Bob	Smith	Life Style Product Leader	Auckland	bsmith@alpheiusge.com.nz	64 9 344 0217	
22	NZ0000018	Whetu	Ramabundi	Tools Product Leader	Auckland	wramabundi@alpheiusge.com.n	64 9 344 0218	
23	IR0000001	Paula	Cleary	Enterprise Leader	Dublin	pcleary@alpheiusge.ie	353 1 873 6558	
24								
25								

The list extends to the left as far as column **A**, and to the right as far as column **G**. It doesn't go up any more rows because **C3** is an empty cell. It goes down as far as row **23**, the last non-empty cell in the column. So the list range is automatically defined as **A4** to **G23**.

You can make any cell in this list the active cell and the list range will be the same. You don't have to select or highlight the range.

Sorting a List

Once a list is available to Excel, the data in it can be **sorted**. The data is usually sorted down a **column**, known in database jargon as a **field**. Data is sorted alpha-numerically, meaning that alphabetical characters are sorted first, and then numbers. If there are only alphabetical characters in it then the list will be sorted alphabetically from left to right. If there are only numbers the list will be sorted numerically. If there is mixed data the list will be sorted by alphabetical characters and then by numbers.

Lists can be sorted in **ascending** order (from lowest to highest) and in **descending** order (from highest to lowest).

PERFORMING AN ALPHABETICAL SORT

The most common use for sorting is to rearrange the data in a *list* in a specific order. A list is simply a grouping of data without any empty columns or rows. In a *list*, a **single column** can

be sorted by placing the cell pointer anywhere in the column that you wish to sort and choosing the **Sort & Filter** command in the **Editing** group.

Try This Yourself:

Open File

Before starting this exercise you **MUST** open the file *Sorting_1.xlsx...*

- 1 Click on the **Sorting Text** worksheet tab and spend a few moments studying the data – it is a list of employees
- 2 Click in cell **C4** to select the cell – this is the **Last Name** column of the listing
- 3 On the **Home** tab, click on **Sort & Filter** in the **Editing** group and select **Sort A to Z**

The data in the list will be sorted alphabetically in ascending order by last name...
- 4 Click on **Sort & Filter** in the **Editing** group again and select **Sort Z to A** to sort the data in descending order
- 5 Repeat the above steps and sort the list by **Position**, by **Office**, and finally by **E-Mail**

2

	A	B	C	D	E
1	Alpheius Leader Listing				
2	Staff Listing				
3					
4	No	First Name	Last Name	Position	Office
5	NZ0000001	Peter	Reynolds	Enterprise Leader	Auckland
6	NZ0000002	Mary	Campbell	Effective People Leader	Auckland
7	NZ0000003	Helen	Kai	Monies Leader	Auckland
8	NZ0000004	Norris	Maunga	Forward Thinking Leader	Auckland
9	NZ0000005	Vivian	Smith	Enterprise Opportunities Leader	Auckland
10	NZ0000006	Grace	Goodson	Communications Service Leader	Auckland
11	NZ0000007	Kate	Rualowy	Insurance Service Leader	Auckland
12	NZ0000008	Brian	Houson	Banking and Finance Service Leader	Auckland
13	NZ0000009	Tara	Kinelly	Legal Service Leader	Auckland
14	NZ0000010	Nora	Mita	Building Services Service Leader	Auckland

3

	A	B	C	D	E
1	Alpheius Leader Listing				
2	Staff Listing				
3					
4	No	First Name	Last Name	Position	Office
5	AU0000016	Nellie	Adams	Vehicles Product Leader	Melbourne
6	FR0000009	Nerida	Arameus	Legal Service Leader	Paris
7	US0000009	Alfred	Beadel	Legal Service Leader	New York
8	AU0000008	Amanda	Bennet	Banking and Finance Service Leader	Melbourne
9	NZ0000016	Hine	Boramori	Vehicles Product Leader	Auckland
10	FR0000010	Victor	Brounson	Building Services Service Leader	Paris
11	AU0000014	Victor	Brown	Electronics Product Leader	Melbourne
12	IR0000015	Michelle	Cahalan	Computer Products Product Leader	Dublin
13	IR0000017	Nora	Caissie	Life Style Product Leader	Dublin
14	NZ0000002	Mary	Campbell	Effective People Leader	Auckland

5

	A	B	C	D	E
1	Alpheius Leader Listing				
2	Staff Listing				
3					
4	No	First Name	Last Name	Position	Office
5	IR0000008	Eireann	McCafferty	Banking and Finance Service Leader	Dublin
6	NZ0000008	Brian	Houson	Banking and Finance Service Leader	Auckland
7	US0000008	Mary-Lou	Dawson	Banking and Finance Service Leader	New York
8	FR0000008	Katerina	Castalova	Banking and Finance Service Leader	Paris
9	AU0000008	Amanda	Bennet	Banking and Finance Service Leader	Melbourne
10	AU0000010	Neville	Smith	Building Services Service Leader	Melbourne
11	US0000010	Marianne	Morris	Building Services Service Leader	New York
12	NZ0000010	Nora	Mita	Building Services Service Leader	Auckland
13	IR0000010	Paddy	Deegan	Building Services Service Leader	Dublin
14	FR0000010	Victor	Brounson	Building Services Service Leader	Paris

For Your Reference...

To **alphabetically sort data** in a *list*.

1. Click in the column to sort, then click on the **Home** tab
2. Click on **Sort & Filter** in the **Editing** group and select either **Sort A to Z** to sort in ascending order, or **Sort Z to A** to sort in descending order

Handy to Know...

- When you choose to sort, Excel searches in all directions from the active cell. The end of the list is deemed to be the first blank cell encountered in all directions: up, down, left and right.
- Excel assumes that the first row of the *list* contains the column heading or **field**.

PERFORMING A NUMERICAL SORT

Microsoft Excel allows you to sort all kinds of data – alphabetic, numeric, dates and mixed. When you place the cell pointer in a cell, Excel determines the data type in that cell and amends

the sort commands accordingly. For example, when sorting alphabetical data, the command will be **Sort A to Z**, but for numeric data it changes to **Sort Smallest to Largest**.

Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file *Sorting_2.xlsx...*

- 1 Click in cell **A4** which represents the start of the employee **No** column
- 2 On the **Home** tab, click on **Sort & Filter** in the **Editing** group and select **Sort A to Z** to sort the data in ascending order
Notice how the list is sorted first by letters, then numbers...
- 3 Click in cell **I5** which is the start of the **Age** column – these cells store numbers
- 4 Click on **Sort & Filter** in the **Editing** group again and select **Sort Smallest to Largest** to sort the data from youngest to oldest
- 5 Repeat the above steps and sort the list by **Telephone**, by **Salary Level** and by **Service**

2

	A	B	C	D	E
1	Alpheius Leader Listing				
2	Staff Listing				
3					
4	No	First Name	Last Name	Position	Office
5	AU000001	Julianne	Kerr	Enterprise Leader	Melbourne
6	AU000002	Harry	Jones	Effective People Leader	Melbourne
7	AU000003	Angel	Harrington	Monies Leader	Melbourne
8	AU000004	Peter	Dawson	Forward Thinking Leader	Melbourne
9	AU000005	Mark	Jones	Enterprise Opportunities Leader	Melbourne
10	AU000006	Maureen	Grayson	Communications Service Leader	Melbourne
11	AU000007	Augustine	Millson	Insurance Service Leader	Melbourne
12	AU000008	Amanda	Bennet	Banking and Finance Service Leader	Melbourne
13	AU000009	George	Samuelson	Legal Service Leader	Melbourne
14	AU000010	Neville	Smith	Building Services Service Leader	Melbourne

3

	G	H	I	J	K	L	M
1							
2							
3							
4	Telephone	DOB	Age	Salary Level	Started	Service	
5	61 3 9844 0002	5/12/1964	50.9	2	28/06/1999	16.4	
6	61 3 9844 0003	6/08/1954	61.3	4	19/07/1999	16.3	
7	61 3 9844 0004	7/08/1956	59.3	3	19/07/1999	16.3	
8	61 3 9844 0005	7/12/1975	39.9	4	19/07/1999	16.3	
9	61 3 9844 0006	23/04/1975	40.6	4	19/07/1999	16.3	
10	61 3 9844 0007	13/05/1967	48.5	6	6/09/1999	16.2	
11	61 3 9844 0008	26/12/1978	36.9	6	6/09/1999	16.2	
12	61 3 9844 0009	25/12/1977	37.9	6	6/09/1999	16.2	
13	61 3 9844 0010	3/04/1957	58.6	6	6/09/1999	16.2	
14	61 3 9844 0011	3/09/1967	48.2	6	6/09/1999	16.2	

4

	G	H	I	J	K	L	M
1							
2							
3							
4	Telephone	DOB	Age	Salary Level	Started	Service	
5	64 9 344 0207	6/07/1982	33.3	6	22/05/2000	15.5	
6	33 1 35 66 02 63	12/11/1980	35.0	6	24/04/2000	15.5	
7	33 1 35 66 02 67	5/06/1980	35.4	6	24/04/2000	15.5	
8	353 1 873 6569	3/04/1980	35.6	6	9/08/1999	16.3	
9	64 9 344 0214	19/12/1979	35.9	5	22/05/2000	15.5	
10	61 3 9844 0008	26/12/1978	36.9	6	6/09/1999	16.2	
11	61 3 9844 0012	14/07/1978	37.3	6	6/09/1999	16.2	
12	64 9 344 0212	24/05/1978	37.5	6	22/05/2000	15.5	
13	33 1 35 66 02 62	16/05/1978	37.5	6	24/04/2000	15.5	
14	1 718 387 5215	23/04/1978	37.6	4	29/11/1999	16.0	

For Your Reference...

To **sort a list numerically**:

1. Click in the column to sort
2. On the **Home** tab, click on **Sort & Filter** in the **Editing** group and select either **Sort Smallest to Largest** to sort in ascending order or **Sort Largest to Smallest** to sort in descending order

Handy to Know...

- If a numeric column contains a formula which displays a calculated value, the sort operation will be performed on the calculated value rather than the formula.

SORTING ON MORE THAN ONE COLUMN

Excel allows you to select multiple columns to sort by, thereby enabling you to analyse data according to different categories. Each column is sorted in order one at a time. The listing is sorted

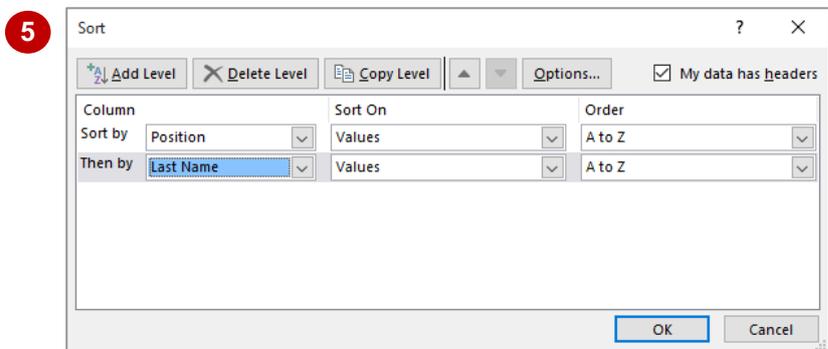
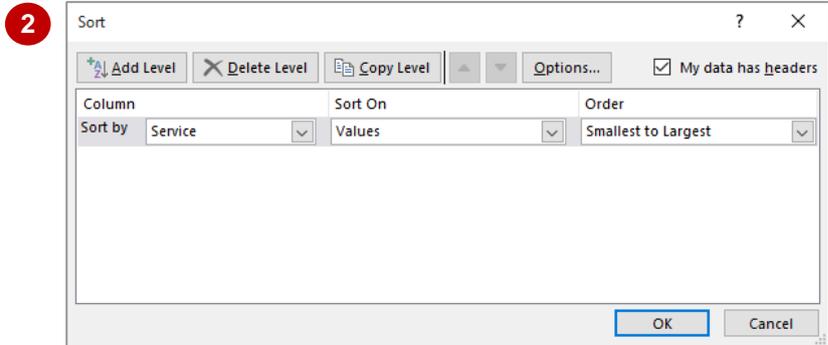
by the first column, then by the second column, and so on. For example, a staff listing can be sorted first by **Position**, then by **Last Name** so that each position contains an alphabetical sub-listing.

Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file *Sorting_3.xlsx...*

- 1 Click in cell **A4** to position the active cell within the list
- 2 On the **Home** tab, click on **Sort & Filter** in the **Editing** group and select **Custom Sort** to display the **Sort** dialog box
- 3 Click on the drop arrow for **Sort by** to display a list of the field (column) names, then select **Position**
- 4 Click on **[Add Level]** to add another level in the dialog box
- 5 Click on the drop arrow for **Then by** and select **Last Name**
- 6 Click on **[OK]** to display the list sorted by **Position** then by **Last Name**



No	First Name	Last Name	Position	Office
5	AU000008	Amanda Bennet	Banking and Finance Service Leader	Melbourne
6	FR000008	Katerina Castalova	Banking and Finance Service Leader	Paris
7	US000008	Mary-Lou Dawson	Banking and Finance Service Leader	New York
8	NZ000008	Brian Houson	Banking and Finance Service Leader	Auckland
9	IR000008	Eireann McCafferty	Banking and Finance Service Leader	Dublin
10	FR000010	Victor Brounson	Building Services Service Leader	Paris
11	IR000010	Paddy Deegan	Building Services Service Leader	Dublin
12	NZ000010	Nora Mita	Building Services Service Leader	Auckland
13	US000010	Marianne Morris	Building Services Service Leader	New York
14	AU000010	Neville Smith	Building Services Service Leader	Melbourne

For Your Reference...

To **sort** on **more than one column**:

1. Click on the **Home** tab, then click on **Sort & Filter** in the **Editing** group
2. Select **Custom Sort**
3. Specify the columns to sort the list on

Handy to Know...

- Be careful when sorting large lists that go beyond the boundaries of the screen. You should ensure that there are no blank rows or columns that can result in you omitting some of the data.

SORTING NUMBERED LISTS

Microsoft Excel allows you to sort any kind of data in the worksheet and it is smart enough to determine the type of sort to perform. Things get a little messy however, when there are lists of

numbers that may also contain subtotals and totals. The problem with these sorts is that Excel can't distinguish between your data and the totals – the totals therefore also get sorted.

Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file *Sorting_4.xlsx...*

- 1 Click on the **Sorting Numbers** worksheet tab and examine the data
- 2 Click in cell **C5** which represents the first value in sales figures for the month of **February**
- 3 On the **Home** tab, click on **Sort & Filter** in the **Editing** group and select **Sort Smallest to Largest** to sort the data

Everything has worked fine because the totals at the bottom of the list are the largest values (being totals)...
- 4 Click on **Sort & Filter** in the **Editing** group and select **Sort Largest to Smallest** – you now have a mess because the **Total** formulas have been sorted out of position
- 5 Click on **Undo** in the **Quick Access Toolbar** to undo the last sort

2

	A	B	C	D	E	F
1	Alpheius Global Enterprises					
2	Sales Revenue					
3						
4	Revenue	Jan	Feb	Mar	Apr	May
5	Auckland	1,050,254	1,547,000	1,488,369	1,523,124	1,358,654
6	Dublin	1,524,294	1,685,548	1,599,854	1,789,552	1,542,963
7	Melbourne	3,521,487	2,985,448	2,741,221	2,521,447	2,255,665
8	New York	2,531,225	2,621,889	2,453,999	2,547,441	1,977,558
9	Paris	550,998	850,554	818,874	837,228	746,664
10	Berlin	838,223	926,778	879,114	983,225	848,999
11	Moscow	1,936,882	1,641,554	1,507,774	1,386,448	1,240,885
12	Total	11,953,363	12,258,771	11,489,205	11,588,465	9,971,388
13						

3

	A	B	C	D	E	F
1	Alpheius Global Enterprises					
2	Sales Revenue					
3						
4	Revenue	Jan	Feb	Mar	Apr	May
5	Paris	550,998	850,554	818,874	837,228	746,664
6	Berlin	838,223	926,778	879,114	983,225	848,999
7	Auckland	1,050,254	1,547,000	1,488,369	1,523,124	1,358,654
8	Moscow	1,936,882	1,641,554	1,507,774	1,386,448	1,240,885
9	Dublin	1,524,294	1,685,548	1,599,854	1,789,552	1,542,963
10	New York	2,531,225	2,621,889	2,453,999	2,547,441	1,977,558
11	Melbourne	3,521,487	2,985,448	2,741,221	2,521,447	2,255,665
12	Total	11,953,363	12,258,771	11,489,205	11,588,465	9,971,388
13						

4

	A	B	C	D	E	F
1	Alpheius Global Enterprises					
2	Sales Revenue					
3						
4	Revenue	Jan	Feb	Mar	Apr	May
5	Total	-	-	-	-	-
6	Melbourne	3,521,487	2,985,448	2,741,221	2,521,447	2,255,665
7	New York	2,531,225	2,621,889	2,453,999	2,547,441	1,977,558
8	Dublin	1,524,294	1,685,548	1,599,854	1,789,552	1,542,963
9	Moscow	1,936,882	1,641,554	1,507,774	1,386,448	1,240,885
10	Auckland	1,050,254	1,547,000	1,488,369	1,523,124	1,358,654
11	Berlin	838,223	926,778	879,114	983,225	848,999
12	Paris	550,998	850,554	818,874	837,228	746,664
13						

For Your Reference...

To **sort** a **numbered list**:

1. Click in the column to sort
2. On the **Home** tab, click on **Sort & Filter** in the **Editing** group and select either **Sort Smallest to Largest** or **Sort Largest to Smallest**

Handy to Know...

- If you have totals at the bottom of a list and you want to perform a numerical sort without including these totals, you can insert a blank row of cells between the last number to be included in the sort and the totals. This tells Excel that the totals are not included in the list.

SORTING BY ROWS

Most of us are used to sorting vertically down a column, rearranging data from highest to lowest, or lowest to highest. Excel also allows you to sort by rows, from left to right. This takes a little more

care to set up and is fraught with potential problems. However, once you have mastered it, you will find it handy to use in your worksheets.

Try This Yourself:

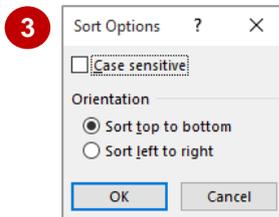
Same File

Continue using the previous file with this exercise, or open the file *Sorting_5.xlsx...*

- 1 Click in cell **B4**, hold down **Shift** and click in cell **G12** to select the range **B4:G12**
- 2 On the **Home** tab, click on **Sort & Filter** in the **Editing** group and select **Custom Sort** to display the **Sort** dialog box
- 3 Click on **[Options]** to display the **Sort Options** dialog box
- 4 Click on **Sort left to right**, then click on **[OK]** to return to the **Sort** dialog box
- 5 Click on the drop arrow for **Sort by** and select **Row 12**
- 6 Click on **[OK]** to see the table totals row (row 12) sorted from lowest to highest

1

	B	C	D	E	F	G	H
1	Enterprises						
2							
3							
4		Jan	Feb	Mar	Apr	May	Jun
5		550,998	850,554	818,874	837,228	746,664	856,887
6		838,223	926,778	879,114	983,225	848,999	1,042,224
7		1,050,254	1,547,000	1,488,369	1,523,124	1,358,654	1,557,147
8		1,936,882	1,641,554	1,507,774	1,386,448	1,240,885	1,406,992
9		1,524,294	1,685,548	1,599,854	1,789,552	1,542,963	1,896,159
10		2,531,225	2,621,889	2,453,999	2,547,441	1,977,558	2,477,332
11		3,521,487	2,985,448	2,741,221	2,521,447	2,255,665	2,558,666
12		11,953,363	12,258,771	11,489,205	11,588,465	9,971,388	11,795,407
13							



6

	B	C	D	E	F	G	H
1	Enterprises						
2							
3							
4		May	Mar	Apr	Jun	Jan	Feb
5		746,664	818,874	837,228	856,887	550,998	850,554
6		848,999	879,114	983,225	1,042,224	838,223	926,778
7		1,358,654	1,488,369	1,523,124	1,557,147	1,050,254	1,547,000
8		1,240,885	1,507,774	1,386,448	1,406,992	1,936,882	1,641,554
9		1,542,963	1,599,854	1,789,552	1,896,159	1,524,294	1,685,548
10		1,977,558	2,453,999	2,547,441	2,477,332	2,531,225	2,621,889
11		2,255,665	2,741,221	2,521,447	2,558,666	3,521,487	2,985,448
12		9,971,388	11,489,205	11,588,465	11,795,407	11,953,363	12,258,771
13							

For Your Reference...

To **sort** by **rows**:

1. On the **Home** tab, click on **Sort & Filter** in the **Editing** group, select **Custom Sort** and click on **[Options]**
2. Click on **Sort left to right**, then click on **[OK]**
3. Choose the row to sort and click **[OK]**

Handy to Know...

- When sorting by rows, select the cells that you want to sort, remembering to include the **column** headings and to exclude the **row** headings and **totals** column.

NOTES:



CHAPTER 2 VALIDATING DATA

InFocus

Data validation is all about making workbooks as foolproof and as user-friendly as possible. The idea is to create workbooks that don't let people make mistakes.

Data validation is similar to cell formatting in that you apply it to a cell. Unlike a format that changes the look of a cell or its contents, data validation checks the data being entered into a cell. If the data is incorrect, data validation can prevent it from being entered.

In this session you will:

- ✓ gain an understanding of data validation
- ✓ learn how to restrict data to a specific number range
- ✓ learn how to test data validation
- ✓ learn how to create an input message
- ✓ learn how to create an error message
- ✓ learn how to create a drop-down list
- ✓ learn how to use formulas as validation criteria
- ✓ learn how to apply circles to invalid data
- ✓ learn how to remove validation circles
- ✓ learn how to copy validation settings.

UNDERSTANDING DATA VALIDATION

The aim of **data validation** is to ensure the accuracy of the data that is entered and this can be achieved using a range of approaches. You can provide information for the user, identify and

reject incorrect values, display error messages and provide a list of valid options that can be entered into the cell. The following describes these options in more detail.

Validation Criteria

You can specify the range of values allowed in a cell. If a user attempts to enter a value outside the specified range, an error message will display. For example, you could limit the possible entries in a cell to numbers between 1 and 12.

Input Messages & Error Messages

You can create messages to give specific help about the type and range of data required in a cell. Input messages appear when you click on the cell before entering data, while error messages appear when the user has entered an invalid number into a cell. You can even create customised error messages to provide specific information about the range of values that are valid.

	A	B	C	D	E	F	G	H	I	J
1										
2		Alpheus Global Enterprises								
3		Auckland Office								
4										
5										
6		Employee Details								
7										
8	Staff ID	Title	First Name	Last Name	Date Hired	Position	Department	Salary	Hours Worked	Dinner Allowance
9										
10	106									
11		ID Codes Please enter a value between 100 and 199.								
12										
13										
14										
15										

This is an example of an input message

Drop-Down Lists

Drop-down lists can be attached to cells to provide a list of valid options for a user. This is ideal where there is a limited number of possible values for a cell, such as the days of the week.

Formulas

As well as being able to set specific limits for values, you can use formulas to create dynamic ranges of values. For example, the **Today()** function can be used to calculate today's date. As validation criteria, this could be used to ensure that a user does not enter a future date in a cell, or to ensure that the date is not too far in the past.

Customised Validation Criteria

As well as a range of standard validation options, you can build quite sophisticated customised validation criteria.

CREATING A NUMBER RANGE VALIDATION

One of the simplest types of data validation is to restrict data to a specific number range. The data validation is set so that Excel expects you to type a number in the cell, and the number must fall

between a set minimum and maximum value. Any other data, such as text or a number outside of the range is rejected. This is ideal for large volumes of data entry and helps to reduce the risk of error.

Try This Yourself:

Open File

Before starting this exercise you **MUST** open the file *Data Validation_1.xlsx...*

1 Ensure that the **Payroll** worksheet is active, then click in cell **A10** to select the cell

2 Click on the **Data** tab, then click on the top half of **Data Validation** in the **Data Tools** group

This will display the **Settings** tab of the **Data Validation** dialog box...

3 Click on the drop arrow for **Allow** in **Validation criteria**, then select **Whole number**

4 Click in **Minimum**, then type **100**

5 Press **Tab**, then type **199** in **Maximum**

6 Click on **[OK]**
Nothing appears to have happened to the cell, but the validation criteria will control what you can type into it

1

	A	B	C	D	E	F	G	H
1								
2		Alpheius Global Enterprises						
3		Auckland Office						
4								
5								
6		Employee Details						
7								
8	Staff ID	Title	First Name	Last Name	Date Hired	Position	Department	Salary
9								
10								
11								
12								

2

5

For Your Reference...

To **apply a number range** as **data validation**:

1. Click on the cell that you want to apply the validation to
2. Click on the **Data** tab, then click on the top half of **Data Validation**
3. Select an option in **Allow**, set the values, then click on **[OK]**

Handy to Know...

- The **Data Validation** dialog box can be used to limit the data to any value, to whole numbers or to decimals. You can also use it to set a maximum and minimum length for information entered into a cell, irrespective of whether it is text, a value or a formula. This setting is called **text length**.

TESTING A VALIDATION

Any **data validation** applied to a worksheet should be **tested** thoroughly before it is unleashed on any unsuspecting users. You must ensure that it not only prevents or dissuades the

entry of invalid numbers, but that you have allowed for all possible situations. You must also ensure that any messages that appear explain clearly how to correct the error that has been made.

Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file *Data Validation_2.xlsx...*

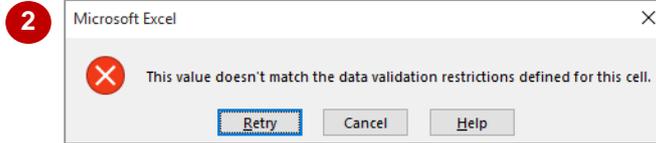
- 1 Ensure the **Payroll** worksheet tab is selected and cell **A10** is active

- 2 Type 1, then press

As this number falls outside of the range specified for this cell (i.e. 100 – 199), a message box will appear...

- 3 Click on **[Retry]**
This will select the contents of the cell so that you can type another number...

- 4 Type **106**, then press
This time the number is within the acceptable range, so the message box does not reappear and the number is accepted



- 3

	A	B	C	D	E	F	G	H
1								
2		Alpheus Global Enterprises						
3		Auckland Office						
4								
5								
6		Employee Details						
7								
8	Staff ID	Title	First Name	Last Name	Date Hired	Position	Department	Salary
9								
10	1							
11								
12								

- 4

	A	B	C	D	E	F	G	H
1								
2		Alpheus Global Enterprises						
3		Auckland Office						
4								
5								
6		Employee Details						
7								
8	Staff ID	Title	First Name	Last Name	Date Hired	Position	Department	Salary
9								
10	106							
11								
12								

For Your Reference...

To **test data validation**:

1. Try entering a range of values within and outside of the defined range
2. If an error message appears, click on **[Retry]** or **[Cancel]**

Handy to Know...

- When you are dealing with a cell that has validation criteria applied to it be aware that if you type text into that cell when it is expecting numbers, the same non-specific error message will be displayed.

CREATING AN INPUT MESSAGE

An **input message** is a message that is displayed when you click on a cell. This provides clear guidance to the user about the values that are expected for a cell. It is far more satisfying

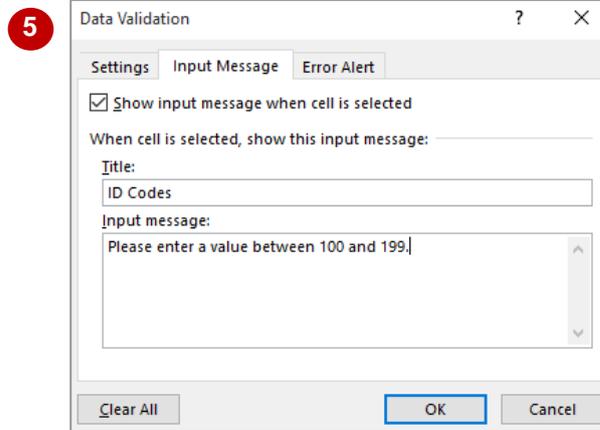
than being faced with a non-specific error message and not knowing how to fix the problem. Input messages should be used with validation criteria to ensure the best possible results.

Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file *Data Validation_3.xlsx...*

- 1 If necessary, click in cell **A10** to select the cell
- 2 Click on the **Data** tab, then click on the top half of **Data Validation** in the **Data Tools** group
- 3 Click on the **Input Message** tab of the **Data Validation** dialog box
- 4 Click in **Title**, then type **ID Codes**
- 5 Click in **Input message**, then type **Please enter a value between 100 and 199.**
- 6 Click on **[OK]**
As cell A10 is still selected, the input message is displayed



	A	B	C	D	E	F	G	H
1								
2		Alpheus Global Enterprises						
3		Auckland Office						
4								
5								
6		Employee Details						
7								
8	Staff ID	Title	First Name	Last Name	Date Hired	Position	Department	Salary
9								
10	106							
11		ID Codes						
12		Please enter a value between 100 and 199.						
13								
14								
15								

6

For Your Reference...

To **create** an **input message**:

1. Click in the cell
2. Click on the **Data** tab, then click on the top half of **Data Validation**
3. Click on the **Input Message** tab
4. Complete the fields, then click on **[OK]**

Handy to Know...

- On the **Input Message** tab of the **Data Validation** dialog box, by clicking on the option **Show input message when cell is selected** until it appears *without* a tick, you can disable the input message without having to delete it permanently.

CREATING AN ERROR MESSAGE

Error messages enable you to replace the standard alerts with something more meaningful. The message "Please enter a value between 100 and 199." indicates that there is an error and

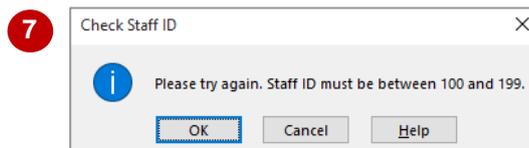
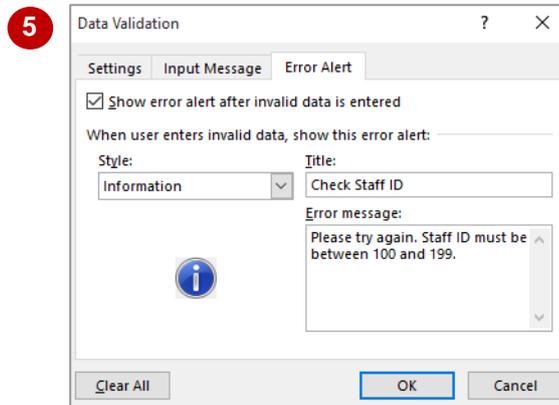
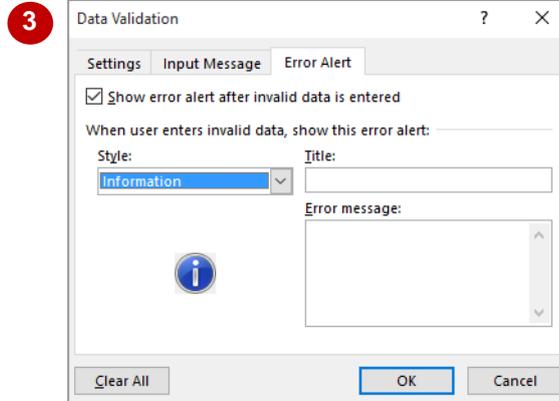
clearly explains what is required. Users will find it much easier to complete their tasks if they know exactly what is expected. The three error message styles are **Stop**, **Warning** and **Information**.

Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file *Data Validation_4.xlsx...*

- 1 Click in cell **A10** to select the cell
- 2 Click on the **Data** tab, click on the top half of **Data Validation** in the **Data Tools** group to display the **Data Validation** dialog box, then click on the **Error Alert** tab
- 3 Click on the drop arrow for **Style**, then select **Information**
Notice that the Stop icon has changed to an Information icon...
- 4 Click in **Title**, then type **Check Staff ID**
- 5 Click in **Error message**, then type **Please try again. Staff ID must be between 100 and 199.**
- 6 Click on **[OK]**, then ensure cell **A10** is still active
- 7 Type **45**, then press **Enter**
Your customised error message will appear...
- 8 Click on **[OK]**
- 9 Click in cell **A10**, type **106**, then press **Enter**



For Your Reference...

To **create** an **error message**:

1. Click on the cell then click on the **Data** tab
2. Click on the top half of **Data Validation**, then click on the **Error Alert** tab
3. Select a **Style**, complete the **Title** and **Error message** fields, then click on **[OK]**

Handy to Know...

- Remember, error messages created using the **Data Validation** dialog box, will only work if you have specified validation criteria for the selected cell.

CREATING A DROP DOWN LIST

If you have a limited number of possible options for a cell, you can create a drop-down list for the user to select from. This ensures that the spelling of choices is consistent and makes it much easier

for the user to complete their data entry tasks. Lists are created using the **Data Validation** settings and a separate list of items is stored in the workbook.

Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file *Data Validation_5.xlsx*...

- 1 Click on the **Sources** worksheet tab, then read the list
The Titles list has been entered as a named range. We'll use it for the drop-down list...
- 2 Click on the **Payroll** worksheet tab, then click in cell **B10**
- 3 On the **Data** tab, click on the top half of **Data Validation** in the **Data Tools** group to display the **Data Validation** dialog box, then click on the **Settings** tab
- 4 Click on the drop arrow for **Allow** and select **List**
- 5 Click in **Source**, click on the **Sources** worksheet tab, select cells **A3** to **A7**, then click on [OK]
Because cell B10 is selected, a drop arrow will appear...
- 6 Click on the drop arrow for cell **B10** to display a list of titles
- 7 Click on **Mr** to select it and enter it into the cell

2

	A	B	C	D	E	F	G	H	
1									
2		Alpheus Global Enterprises							
3		Auckland Office							
4									
5									
6		Employee Details							
7									
8		Staff ID	Title	First Name	Last Name	Date Hired	Position	Department	Salary
9									
10		106							
11									
12									

3

Data Validation

Settings Input Message Error Alert

Validation criteria

Allow: Any value [v] Ignore blank

Data: between [v]

Apply these changes to all other cells with the same settings

Clear All OK Cancel

6

	A	B	C	D	E	F	G	H	
1									
2		Alpheus Global Enterprises							
3		Auckland Office							
4									
5									
6		Employee Details							
7									
8		Staff ID	Title	First Name	Last Name	Date Hired	Position	Department	Salary
9									
10		106							
11			Mr						
12			Mrs						
13			Ms						
14			Miss						
15			Dr						

For Your Reference...

To **create** a **drop-down list**:

1. Type a list of items and click where you want the list to appear
2. Click on the **Data** tab, then click on the top half of **Data Validation**
3. On the **Settings** tab select **List** in **Allow**, type the list range in **Source**, click on [OK]

Handy to Know...

- When creating a list of items to use in a drop-down list, you can create a range name for the list to make it easier to locate when using the **Data Validation** dialog box. Keeping the list on a separate worksheet helps to protect it. You could also hide the worksheet with the list to better protect it.

USING FORMULAS AS VALIDATION CRITERIA

You can use fixed values as validation criteria if they never change. However, if you need to specify a **dynamic range**, where the values change depending on the conditions stated, you

can use a formula. For example, you may want to ensure that the date entered falls within the last week. This can be done by using a **formula** that includes a date function as the validation criteria.

Try This Yourself:

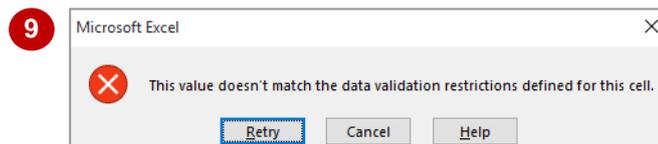
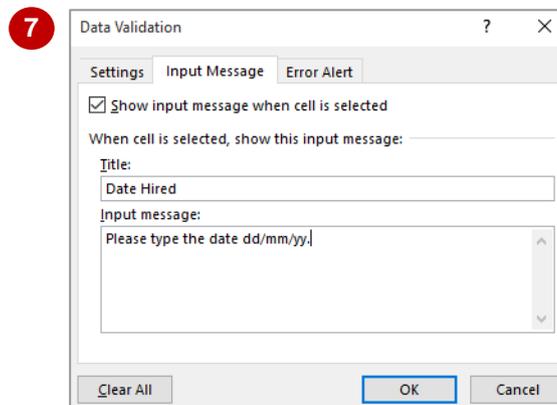
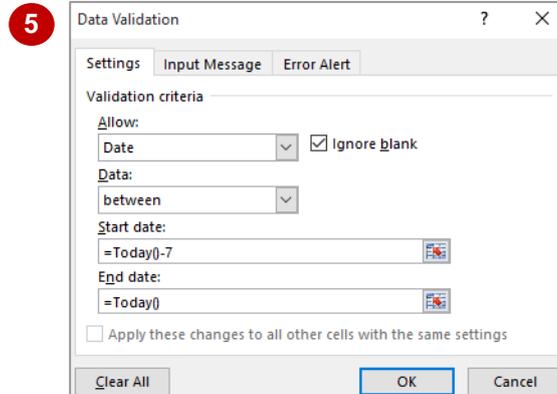
Same File

Continue using the previous file with this exercise, or open the file *Data Validation_6.xlsx*...

- 1 Click on cell **E10** to select the cell
- 2 Click on the **Data** tab, click on the top half of **Data Validation** in the **Data Tools** group to display the **Data Validation** dialog box
- 3 Click on the drop arrow for **Allow** and select **Date**
- 4 Click in **Start date** and type **=Today()-7**
- 5 Click in **End date** and type **=Today()**

We'll display an example of the date format required, as a message...

- 6 Click on the **Input Message** tab, then click in **Title** and type **Date Hired**
- 7 Click in **Input message** and type **Please type the date as dd/mm/yy.**
- 8 Click on **[OK]**
- 9 Enter tomorrow's date, then press **Enter** to test the validation, then click on **[Retry]** and enter today's date



For Your Reference...

To **use formulas** as **validation criteria**:

1. Click on the cell to apply the validation to
2. On the **Data** tab click on the top half of **Data Validation** then click on the **Settings** tab
3. Select an option for **Allow**, then type formulas as limits and click on **[OK]**

Handy to Know...

- When using formulas as validation criteria, be sure to use error messages to clearly explain what is expected in the cell, so that the criteria according to the formula are met.

CIRCLING INVALID DATA

Data validation works when a user enters data directly into the cell with validation criteria. Data validation does not work, however, if data is copied into a cell with validation criteria, or if an

invalid entry is made as a result of a formula in the cell or if it is generated through a macro. Excel can identify cells containing **invalid data**, using **red circles**, to highlight them.

Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file *Data Validation_7.xlsx*...

- 1 Click on the **HR** worksheet tab to display this worksheet
Notice the Staff ID for the last entry was typed incorrectly, where "12" should be "112" – let's copy this entry to a cell with data validation...
- 2 Click in cell **B20** to select the cell
- 3 Press **Ctrl + C** to copy the cell contents, then click on the **Payroll** worksheet tab and click in cell **A10**
This cell has validation criteria...
- 4 Press **Ctrl + V** to paste the value into the cell, then press **Enter** twice to see the cell more clearly
The error message was not generated. Let's use red circles to highlight the issues...
- 5 On the **Data** tab click on the bottom half of **Data Validation** in the **Data Tools** group, and select **Circle Invalid Data**
A red circle indicates the cell with invalid data, according to the validation criteria applied

Staff ID	Title	First Name	Last Name	Date Hired	Position	Department	Salary	Hours Work
106	Mr			20/11/2015				

3

Staff ID	Title	First Name	Last Name	Date Hired	Position	Department	Salary	Hours Work
12	Mr			20/11/2015				

4

Staff ID	Title	First Name	Last Name	Date Hired	Position	Department	Salary	Hours Work
12	Mr			20/11/2015				

5

For Your Reference...

To **circle invalid data**:

1. Click on the **Data** tab
2. Click on the bottom half of **Data Validation** in the **Data Tools** group
3. Select **Circle Invalid Data**

Handy to Know...

- If the Excel window is not maximised, you might not see the tools on the ribbon in their large format, where some tools have a top and bottom half. In this instance, the tool will appear smaller and display a small drop-down arrow at the end of the tool name (equivalent to the "bottom half").

REMOVING INVALID CIRCLES

Data validation circles enable you to effectively audit your worksheets and ensure data integrity. Even if invalid data has managed to appear in cells containing data validation criteria, data

circles will highlight the anomaly for you, enabling you to address any issues. There are two ways to remove invalid data circles: enter valid data into the cell or turn the data circles off.

Try This Yourself:

Open File

Before starting this exercise you **MUST** open the file *Data Validation_8.xlsx*...

- 1 Ensure that the **Payroll** worksheet is active, then click on the **Data** tab
- 2 Click on the bottom half of **Data Validation** and select **Circle Invalid Data** to see the circles
- 3 Repeat steps 1 and 2 to select **Clear Validation Circles**
All red circles will be removed from the worksheet. Let's turn them back on and then remove an individual validation circle...
- 4 Repeat step 2 to redisplay the invalid data circle
Let's remove the circle a different way...
- 5 Click in cell **A10** to select the cell with the invalid data
- 6 Type **112** and press
- 7 Click in cell **E10** and type today's date and press

2

	A	B	C	D	E	F	G	H	I	
1										
2		Alpheius Global Enterprises								
3		Auckland Office								
4										
5										
6										
7										
8		Staff ID	Title	First Name	Last Name	Date Hired	Position	Department	Salary	Hours Work
9										
10		12	Mr			7/05/2014				
11										
12										
13										
14										
15										

3

	A	B	C	D	E	F	G	H	I	
1										
2		Alpheius Global Enterprises								
3		Auckland Office								
4										
5										
6										
7										
8		Staff ID	Title	First Name	Last Name	Date Hired	Position	Department	Salary	Hours Work
9										
10		12	Mr			7/05/2014				
11										
12										
13										
14										
15										

6

	A	B	C	D	E	F	G	H	I	
1										
2		Alpheius Global Enterprises								
3		Auckland Office								
4										
5										
6										
7										
8		Staff ID	Title	First Name	Last Name	Date Hired	Position	Department	Salary	Hours Work
9										
10		112	Mr			7/05/2014				
11										
12										
13										
14										
15										

For Your Reference...

To **remove invalid data circles**:

- Type valid data into the cell(s), or
On the **Data** tab, click on the bottom half of **Data Validation** and select **Clear Validation Circles**

Handy to Know...

- Validation circles are only temporary – they are removed if you save or close a workbook, but you can activate them again at any time.

COPYING VALIDATION SETTINGS

Data validation is usually applied to a range of cells rather than a single cell. The most appropriate way to create data validation is to create and test it in a single cell and then apply

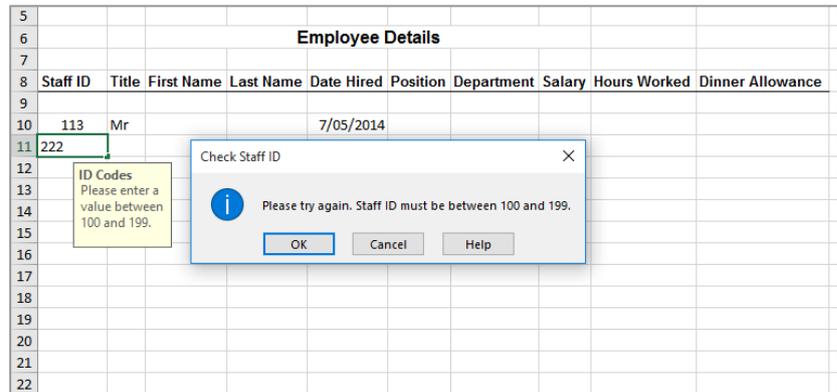
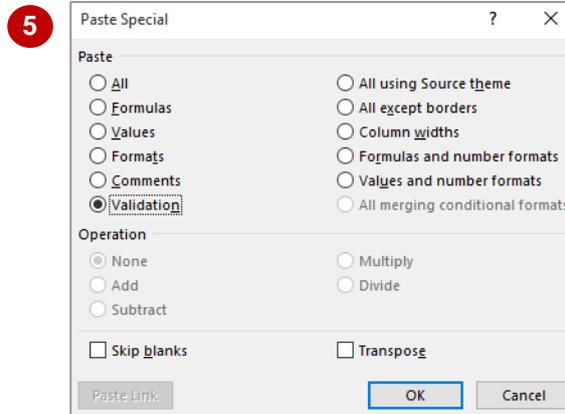
the same validation technique to the rest of the cells. The **Paste Special** dialog box has an option specifically designed to copy validation criteria created using the **Data Validation** dialog box.

Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file *Data Validation_9.xlsx...*

- 1 Click on the **Payroll** worksheet tab, then select **A10:J10**
Cells A10, B10, E10 and J10 have validation rules applied...
- 2 Press **Ctrl** + **C** to copy the range
- 3 Select **A11:J20**
This is the destination range...
- 4 Click on the **Home** tab, then click on the bottom half of **Paste** in the **Clipboard** group and select **Paste Special**
- 5 Click on **Validation** in **Paste** to select it
- 6 Click on **[OK]** to paste the validations
- 7 Type some test employee data in row 11 to test the validation rules



For Your Reference...

To **copy data validation**:

1. Select the cells with the data validation, then press **Ctrl** + **C** to copy the contents
2. Select the destination cells
3. On the **Home** tab, click on the bottom half of **Paste** and select **Paste Special**
4. Click on **Validation** and click on **[OK]**

Handy to Know...

- Copying and pasting validations does not transfer conditional formatting if applied to cells. To copy conditional formatting, copy the cell, then select **Format** in the **Paste Special** dialog box.

NOTES:



CHAPTER 3 FINDING AND REPLACING

InFocus

As the names imply, **finding** involves looking for particular information or data in a worksheet and **replacing** involves replacing the data you've found with a new value.

In this session you will:

- ✓ gain an understanding of find and replace operations
- ✓ learn how to find text
- ✓ learn how to find cell references in formulas
- ✓ learn how to replace values
- ✓ learn how to use replace to change formulas
- ✓ learn how to replace data within a specific range
- ✓ learn how to find formats
- ✓ learn how to find constants using **Go To Special**
- ✓ learn how to find formulas using **Go To Special**
- ✓ learn how to find the current region
- ✓ learn how to find the last cell.

UNDERSTANDING FIND AND REPLACE OPERATIONS

Worksheets can become very complex rather quickly and it can then be time consuming to locate specific information in the file. This is where the **Find** operation is useful. **Find** allows

you to search for a range of elements so that you can check details or make changes. **Replace** is the natural progression from **Find**, allowing you to replace what you've found with an alternative.

Find

The **Find** operation searches through the active worksheet for whatever you type in the **Find what** field of the **Find and Replace** dialog box. In the example below, as the result of a search for **514**, the cell pointer has moved to cell **B10** because this is the first occurrence of the value **514**. **[Find Next]** is used to find the next occurrence of **514** and **[Find All]** is used to create a list of all of the occurrences.

	A	B	C	D	E	F	G	H	I
1	Alpheius Global Enterprises								
2	Shop Sales for Month of:			10%	5%				
3									
4	Catalogue No	Model	Wholesale	Sale Price	Units Sold	Gross Profit	Net Profit	Projected Sales	Projected Net Profit
5									
6	Communications								
7	TEL00001	World Communicator 223	56.77	83.00	15	1,245.00	393.45	16	419.68
8	TEL00002	Planet Tamer 34e	122.50	178.00	12	2,136.00	666.00	13	721.50
9	TEL00003	Master Communicator 10 Plus	677.99	984.00	11	10,824.00	3,366.11	12	3,672.12
10	TEL00005	Global Roamer 514	76.00	111.00	34	3,774.00	1,190.00	37	1,295.00
11	TEL00006	Global Roamer 515	144.55	210.00	56	11,760.00	3,665.20	61	3,992.45
12	TEL00007	Global Roamer 516	455.50	661.00	43	28,423.00	8,836.50	47	9,658.50
13	TEL00008	Global Roamer 517	566.78	822.00	22	18,084.00	5,614.84	24	6,125.28
14									
15						76,246.00	23,732.10		25,884.53
16	Electronics								
17	ELEC00001					2,375.00	812.50	137	890.50
18	ELEC00002					17,544.00	5,676.00	378	6,237.00
19	ELEC00005					5,432.00	1,694.00	30	1,815.00
20	ELEC00006					10,848.00	3,376.00	35	3,692.50
21	ELEC00007					4,225.00	1,332.50	71	1,455.50
22									
23						40,424.00	12,891.00		14,090.50
24									
25						Grand Total	116,670.00	36,623.10	39,975.03
26									

Replace

The **Replace** operation also searches through the active worksheet for whatever you've typed in the **Find what** field of the **Find and Replace** dialog box. You can then use **[Replace]** to substitute the text in **Replace with** for the found text. In this example, **514** has been replaced by **518**. You can use the **Find and Replace** dialog box to find (and replace) parts of cell entries or entire cell entries.

	A	B	C	D	E	F	G	H	I
1	Alpheius Global Enterprises								
2	Shop Sales for Month of:			10%	5%				
3									
4	Catalogue No	Model	Wholesale	Sale Price	Units Sold	Gross Profit	Net Profit	Projected Sales	Projected Net Profit
5									
6	Communications								
7	TEL00001	World Communicator 223	56.77	83.00	15	1,245.00	393.45	16	419.68
8	TEL00002	Planet Tamer 34e	122.50	178.00	12	2,136.00	666.00	13	721.50
9	TEL00003	Master Communicator 10 Plus	677.99	984.00	11	10,824.00	3,366.11	12	3,672.12
10	TEL00005	Global Roamer 518	76.00	111.00	34	3,774.00	1,190.00	37	1,295.00
11	TEL00006	Global Roamer 515	144.55	210.00	56	11,760.00	3,665.20	61	3,992.45
12	TEL00007	Global Roamer 516	455.50	661.00	43	28,423.00	8,836.50	47	9,658.50
13	TEL00008	Global Roamer 517	566.78	822.00	22	18,084.00	5,614.84	24	6,125.28
14									
15						76,246.00	23,732.10		25,884.53
16	Electronics								
17	ELEC00001					2,375.00	812.50	137	890.50
18	ELEC00002					17,544.00	5,676.00	378	6,237.00
19	ELEC00005					5,432.00	1,694.00	30	1,815.00
20	ELEC00006					10,848.00	3,376.00	35	3,692.50
21	ELEC00007					4,225.00	1,332.50	71	1,455.50
22									
23						40,424.00	12,891.00		14,090.50
24									
25						Grand Total	116,670.00	36,623.10	39,975.03
26									

FINDING TEXT

Common reasons to **find text** in a worksheet are because you want to locate an entry that you know exists, or because you don't know if the entry does exist. A **Find** operation in Excel

requires you to specify the text, value and/or format that you want to search for. Excel will search the active worksheet then select the first cell that matches the criteria.

Try This Yourself:

Open File

Before starting this exercise you **MUST** open the file *Find And Replace_1.xlsx...*

- 1 Click on the **Home** tab, then click on **Find & Select** in the **Editing** group to display a menu of options

The menu includes a series of options for locating specific types of data or cells in the worksheet...

- 2 Select **Find** to display the **Find and Replace** dialog box

- 3 Type **broadband**, then click on **[Find Next]**

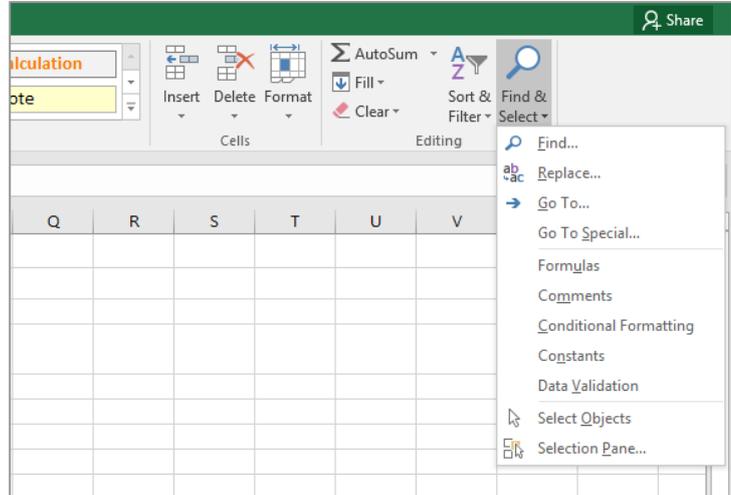
The cell pointer will move to the first cell that contains matching text. Notice that Excel includes results with different text case and, by default, looks for the text even if it is only part of a cell entry...

- 4 Click on **[Find Next]** to find the next occurrence of **broadband**

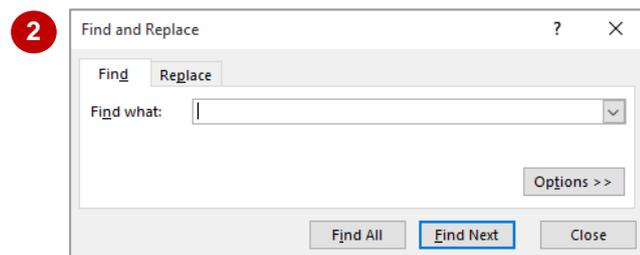
- 5 Click on **[Find Next]** two more times, watching which cells the cell pointer moves to

Since there are no more examples of **broadband**, the cell pointer will move back to the first instance...

- 6 Click on **[Close]** to close the **Find and Replace** dialog box



1



2

	A	B	C	D	E
13	TELE00008	Global Roamer 517	566.78	822.00	22
14					
15					Sub Total:
16	Electronics				
17	ELEC00001	Home View 260	12.50	19.00	125
18	ELEC00002	Home View 360	34.50	51.00	344
19	ELEC00005	BroadBand 15	133.50	194.00	28
20	ELEC00006	BroadBand 16	233.50	339.00	32
21	ELEC00007	BroadBand 17	44.50	65.00	65
22					

3

For Your Reference...

To **find text**:

1. Click on the **Home** tab, then click on **Find & Select** in the **Editing** group
2. Select **Find**
3. Type the text
4. Click on **[Find Next]**

Handy to Know...

- You can search the entire workbook or just the active sheet by clicking on **[Options]** in the **Find and Replace** dialog box, then selecting **Workbook** or **Sheet** in **Within**.
- You can restrict the search to text with the same case by clicking on **Match case** under **[Options]**.

FINDING CELL REFERENCES IN FORMULAS

If you make extensive use of formulas in Excel, a very common search that you are likely to use is to find every cell that includes a **reference** to a particular cell. For example, you may want to find

all of the formulas that use the value in cell **A23**. To do this you need to look for data that forms part of a cell entry. Fortunately, this is a default **Find** option.

Try This Yourself:

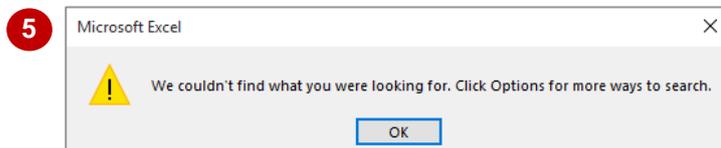
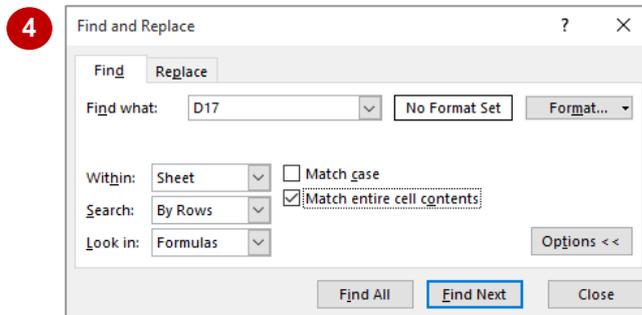
Same File

Continue using the previous file with this exercise, or open the file *Find And Replace_2.xlsx...*

- 1 Click on the **Home** tab, click on **Find & Select** in the **Editing** group, select **Find**, then type **D17** in **Find what**
- 2 Click on **[Find Next]**
The cell pointer will now stop on cell **F17** which contains the formula **=D17*E17...**
- 3 Click on **[Find Next]** until you return to cell **F17**
- 4 In the **Find and replace** dialog box, click on **[Options]**, then click on **Match entire cell contents** so it appears with a tick
- 5 Click on **[Find Next]**
Excel will advise that it can't find the data. This has occurred because Excel is looking for a cell that contains only **D17...**
- 6 Click on **[OK]** to close the message
- 7 Click on **[Options]** to hide the options then click on **[Close]**

2

	D	E	F	G	H	I	J
16							
17	19.00	125	2,375.00	812.50	137	890.50	
18	51.00	344	17,544.00	5,676.00	378	6,237.00	
19	194.00	28	5,432.00	1,694.00	30	1,815.00	
20	339.00	32	10,848.00	3,376.00	35	3,692.50	
21	65.00	65	4,225.00	1,332.50	71	1,455.50	
22							
23		Sub Total:	40,424.00	12,891.00		14,090.50	
24							
25		Grand Total	116,670.00	36,623.10		39,975.03	
26							



For Your Reference...

To **find cell references**:

1. Click on the **Home** tab, then click on **Find & Select** in the **Editing** group
2. Select **Find**
3. Type the cell reference
4. Click on **[Find Next]**

Handy to Know...

- **Match entire cell contents** is very useful if you want to search for a particular number and know that it appears in a cell by itself. For example, if you want to locate **12** and turn on **Match entire cell contents**, Excel will ignore entries such as 112, 12,234 and 45.12, and only accept 12.

REPLACING VALUES

Replacing is the natural extension of **finding**. After all, why do you search for something? Quite often it is because you want to update it. You undertake a replace operation by nominating

what to find and what the found data should be replaced with. You can even use **Replace** to remove data by finding the data and replacing it with nothing.

Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file *Find And Replace_3.xlsx*...

- 1 Click on the **Home** tab, then click on **Find & Select** in the **Editing** group and select **Replace**

The *Find and Replace* dialog box will appear with the *Replace* tab active...

- 2 Double-click on the text in **Find what** and type **global roamer**

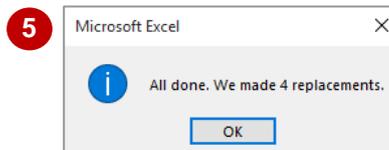
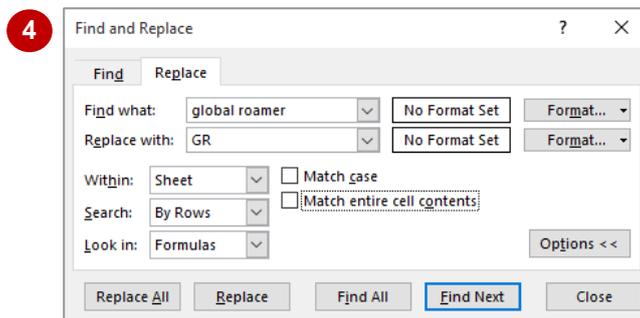
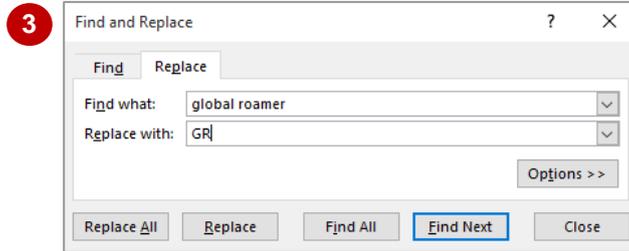
- 3 Press **Tab** and type **GR** in **Replace with**

- 4 Click on **[Options]** and ensure on **Match entire cell contents** appears without a tick

- 5 Click on **[Replace All]** to replace the text
Excel will advise that it has made four replacements...

- 6 Click on **[OK]** to close the message box

- 7 In the *Find and Replace* dialog box, click on **[Options]** to hide the options, then click on **[Close]**
The last four communications products have now been renamed



- 7

	A	B	C	D	E
1	Alpheius Global Enterprises				
2	Shop Sales for Month of:			10%	5%
3					
4	Catalogue No	Model	Wholesale	Sale Price	Units Sold
5					
6	Communications				
7	TEL00001	World Communicator 223	56.77	83.00	15
8	TEL00002	Planet Tamer 34e	122.50	178.00	12
9	TEL00003	Master Communicator 10 Plus	677.99	984.00	11
10	TEL00005	GR 514	76.00	111.00	34
11	TEL00006	GR 515	144.55	210.00	56
12	TEL00007	GR 516	455.50	661.00	43
13	TEL00008	GR 517	566.78	822.00	22
14					

For Your Reference...

To **replace values**:

1. Click on the **Home** tab, then click on **Find & Select** in the **Editing** group
2. Select **Replace**
3. Type the text to find and the text to replace it with, then click on **[Replace All]**

Handy to Know...

- You can use **wildcards** to narrow your search so that you find information that has certain characters only. Use a question mark (?) to replace individual characters, an asterisk (*) to replace multiple characters, and a tilde (~) to search for wildcard characters (such as ~? to search for a ?).

USING REPLACE TO CHANGE FORMULAS

Once you've mastered find and replace concepts, you can use the techniques to perform some very interesting operations in a worksheet. Find and replace can be useful on those occasions when

you have to make a structural change to a worksheet and need to ensure that the formulas are updated correctly, for example.

Try This Yourself:

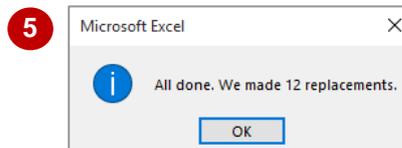
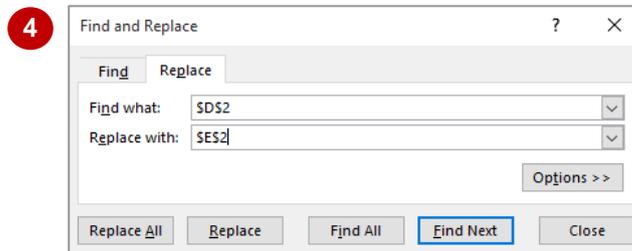
Same File

Continue using the previous file with this exercise, or open the file *Find And Replace_4.xlsx*...

- 1 Click on cell **H7** and examine the formula in the **Formula Bar**
`=INT(E7+(E7*D2))`
calculates the projected sales based on the rate in \$D\$2. We can change the formula to refer to the rate in \$E\$2 instead...
- 2 On the **Home** tab, click on **Find & Select** in the **Editing** group and select **Replace**
- 3 Delete the text in **Find what** and type **\$D\$2**
- 4 Press **Tab** and type **\$E\$2** in **Replace with**
- 5 Click on **[Replace All]** to replace the formulas in column **H** and to update the results of the formula
There should be 12 replacements...
- 6 Click on **[OK]** to close the message box then click on **[Close]**
- 7 Check the modified formula in cell **H7** in the **Formula Bar**

1

	D	E	F	G	H	I	J
4	Sale Price	Units Sold	Gross Profit	Net Profit	Projected Sales	Projected Net Profit	
5							
6							
7	83.00	15	1,245.00	393.45	16	419.68	
8	178.00	12	2,136.00	666.00	13	721.50	
9	984.00	11	10,824.00	3,366.11	12	3,672.12	
10	111.00	34	3,774.00	1,190.00	37	1,295.00	
11	210.00	56	11,760.00	3,665.20	61	3,992.45	
12	661.00	43	28,423.00	8,836.50	47	9,658.50	
13	822.00	22	18,084.00	5,614.84	24	6,125.28	
14							



7

	D	E	F	G	H	I	J
4	Sale Price	Units Sold	Gross Profit	Net Profit	Projected Sales	Projected Net Profit	
5							
6							
7	83.00	15	1,245.00	393.45	15	393.45	
8	178.00	12	2,136.00	666.00	12	666.00	
9	984.00	11	10,824.00	3,366.11	11	3,366.11	
10	111.00	34	3,774.00	1,190.00	35	1,225.00	
11	210.00	56	11,760.00	3,665.20	58	3,796.10	
12	661.00	43	28,423.00	8,836.50	45	9,247.50	
13	822.00	22	18,084.00	5,614.84	23	5,870.06	
14							

For Your Reference...

To use **replace** to **change formulas**:

1. Click on the **Home** tab, then click on **Find & Select** in the **Editing** group
2. Type the text to find in **Find what**
3. Type the replacement text in **Replace with**
4. Click on **[Replace All]**

Handy to Know...

- Always save your workbook before performing a **Replace All** operation. If you end up with some unexpected results, you can close the workbook without saving it and then open it to start again.

REPLACING WITHIN A RANGE

The **Find and Replace** feature can also be used to replace only certain instances of the text for which you search. For example, instead of changing the formulas in the entire worksheet,

you may wish to change only those in a specific range. To do this, you simply select the **range** of cells in which you want to search, before commencing the **Find and Replace** operation.

Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file *Find And Replace_5.xlsx...*

- 1 Click in cell **F15**, hold down **Ctrl** and click on cells **F23** and **F25**, then release **Ctrl**

The three cells will be selected. Notice in the Formula Bar that the values are based on the **SUM** function. We will change them to an **AVERAGE** function...

- 2 On the **Home** tab, click on **Find & Select** in the **Editing** group and select **Replace** to display the **Find and Replace** dialog box

- 3 Double-click on the text in **Find what** and type **sum**

- 4 Press **Tab** and type **average** in **Replace with**

- 5 Click on **[Replace All]** to replace all of the values that match within the selected area

- 6 Click on **[OK]** to close the message box, then click on **[Close]**

Notice that the formula in the Formula Bar. for the selected cells is now an **AVERAGE** function

1

	D	E	F	G	H	I	J
13	822.00	22	18,084.00	5,614.84	23	5,870.06	
14							
15		Sub Total:	76,246.00	23,732.10		24,564.22	
16							
17	19.00	125	2,375.00	812.50	131	851.50	
18	51.00	344	17,544.00	5,676.00	361	5,956.50	
19	194.00	28	5,432.00	1,694.00	29	1,754.50	
20	339.00	32	10,848.00	3,376.00	33	3,481.50	
21	65.00	65	4,225.00	1,332.50	68	1,394.00	
22							
23		Sub Total:	40,424.00	12,891.00		13,438.00	
24							
25		Grand Total	116,670.00	36,623.10		38,002.22	
26							

4

Find and Replace

Find what: sum

Replace with: average

Options >>

Replace All Replace Find All Find Next Close

6

	D	E	F	G	H	I	J
13	822.00	22	18,084.00	5,614.84	23	5,870.06	
14							
15		Sub Total:	10,892.29	23,732.10		24,564.22	
16							
17	19.00	125	2,375.00	812.50	131	851.50	
18	51.00	344	17,544.00	5,676.00	361	5,956.50	
19	194.00	28	5,432.00	1,694.00	29	1,754.50	
20	339.00	32	10,848.00	3,376.00	33	3,481.50	
21	65.00	65	4,225.00	1,332.50	68	1,394.00	
22							
23		Sub Total:	8,084.80	12,891.00		13,438.00	
24							
25		Grand Total	9,488.54	36,623.10		38,002.22	
26							

For Your Reference...

To **replace within a range**:

1. Select the range
2. Click on the **Home** tab, then click on **Find & Select** in the **Editing** group
3. Select **Replace**, then type the **Find what** and **Replace with** text
4. Click on **[Replace All]**

Handy to Know...

- With **Find**, you can use **Look in** to specify **Values**, **Formulas** or **Comments**. **Values** searches for a value that is the **result** of a formula, as opposed to a value that has been entered directly. With **Replace**, **Look in** is set to **Formulas**, which allows you to look at any direct cell entry except comments.

FINDING FORMATS

You can search for specific **format** settings in a worksheet. Formats can help you identify and locate specific cells, such as percentages or headings. The **Find** feature allows you to search

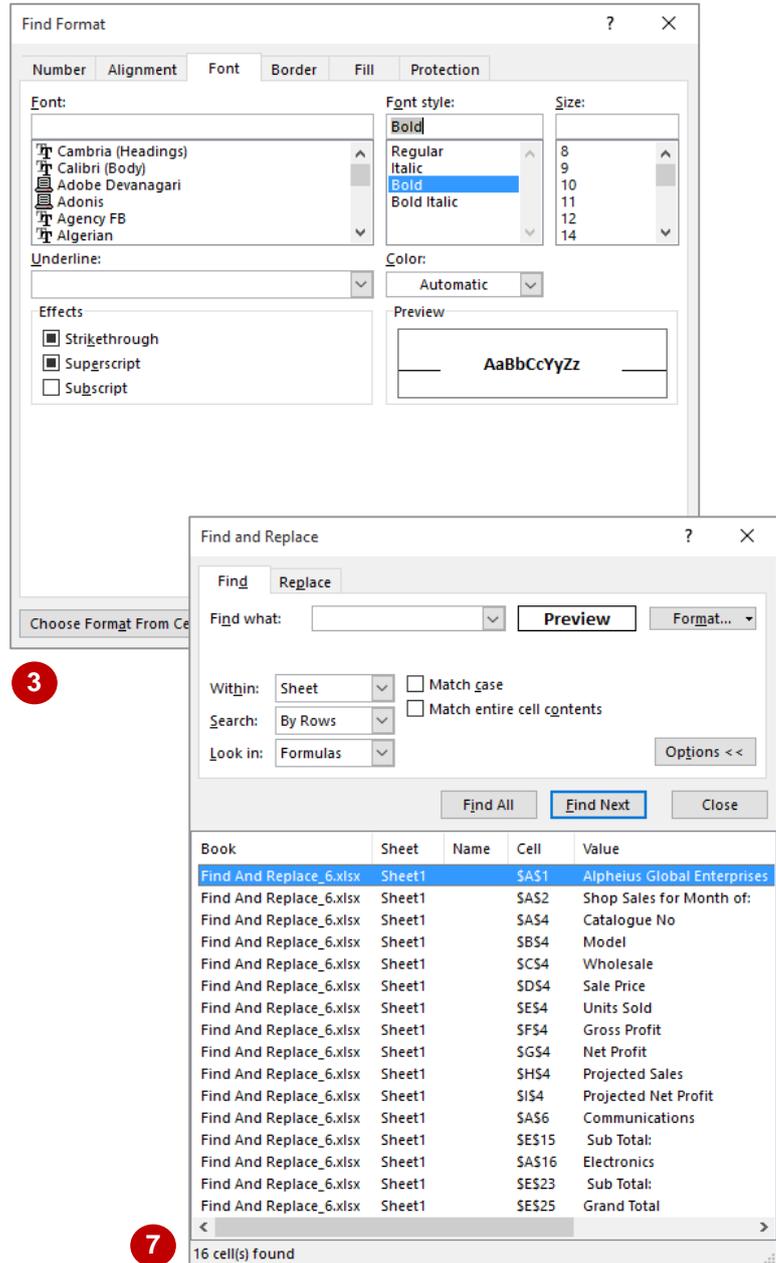
for format settings on their own or for a particular word or value with specific format settings. You can either locate the next matching cell or create a list of all entries that match the search criteria.

Try This Yourself:

Open File

Before starting this exercise you **MUST** open the file *Find And Replace_6.xlsx*...

- 1 On the **Home** tab, click on **Find & Select** in the **Editing** group, select **Find**, then click on **[Options]**
- 2 Click on **[Format]** to display the **Find Format** dialog box
- 3 Click on the **Font** tab, then click on **Bold** under **Font style**
- 4 Click on **[OK]** to see a preview
- 5 Click on **[Find Next]**
The next occurrence in the worksheet will be selected, which is in cell A2...
- 6 Click on **[Find All]**
The cells with this format will be listed. You may have to resize the dialog box to view them all...
- 7 Drag down the bottom of the dialog box to display the full list
The entries are hyperlinked...
- 8 In the **Find and Replace** dialog box, click on **\$B\$4 Model** to select this cell, then click on **[Close]**



For Your Reference...

To **find formats**:

1. Click on the **Home** tab, click on **Find & Select** in the **Editing** group, then select **Find**
2. Click on **[Options]**, then click on **[Format]**
3. Select the format, then click on **[OK]**
4. Type any required text, then click on **[Find Next]**

Handy to Know...

- You can specify existing formatting by clicking on **[Choose Format From Cell]** on the **Font** tab in the **Find Format** dialog box, then clicking on a formatted cell.
- You can clear formatting by clicking on **[Clear]** in the **Find Format** dialog box.

FINDING CONSTANTS USING GO TO SPECIAL

Sometimes it can be really difficult to work out which cells contain values that you can change as opposed to formulas that you shouldn't touch. A **constant** is any cell that contains a value or

text that is not the result of a formula – in other words, it remains constant. The **Go To Special** dialog box can be used to select all constants in the worksheet.

Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file *Find And Replace_7.xlsx...*

1 On the **Home** tab click on **Find & Select** in the **Editing** group, then select **Go To Special** to display the **Go To Special** dialog box

2 Click on **Constants**

3 Click on **[OK]**

All cells that contain an entry that is not a formula will be selected...

4 Repeat step 1 to redisplay the **Go To Special** dialog box

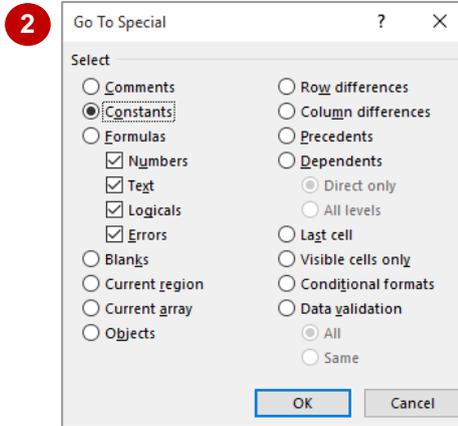
5 Click on **Constants** then click on **Text**, **Logicals** and **Errors** to remove the ticks for each of these

This leaves **Numbers** selected...

6 Click on **[OK]**

Only the cells that contain numbers will be selected.

You could use this selection to apply shading to all cells in the worksheet that can be safely modified, for example



3

	A	B	C	D	E
1	Alpheius Global Enterprises				
2	Shop Sales for Month of:			10%	5%
3					
4	Catalogue No	Model	Wholesale	Sale Price	Units Sold
5					
6	Communications				
7	TEL00001	World Communicator 223	56.77	83.00	15

6

	A	B	C	D	E
1	Alpheius Global Enterprises				
2	Shop Sales for Month of:			10%	5%
3					
4	Catalogue No	Model	Wholesale	Sale Price	Units Sold
5					
6	Communications				
7	TEL00001	World Communicator 223	56.77	83.00	15

For Your Reference...

To **find constants** using **Go To Special**:

1. On the **Home** tab, click on **Find & Select** in the **Editing** group and select **Go To Special**
2. Click on **Constants**
3. Click on **[OK]**

Handy to Know...

- You can select constants by clicking on **Find & Select** in the **Editing** group and selecting **Constants** but the **Go To Special** dialog box gives you more control over the command.
- You can use the **Go To Special** dialog box to select all of the **Comments** in a worksheet.

FINDING FORMULAS USING GO TO SPECIAL

If you want to verify the accuracy of a worksheet, you should check the formulas. You can locate formulas either by clicking on each cell and looking at the **Formula Bar**, or by selecting them

all using **Find & Select**. A **formula** is any entry that starts with the equal sign (=) and displays a calculated entry of text, a value or a logical entry such as Yes or No.

Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file *Find And Replace_8.xlsx...*

- 1 Click in cell **A1** to deselect the current range
- 2 On the **Home** tab, click on **Find & Select** in the **Editing** group and select **Go To Special** to display the **Go To Special** dialog box
- 3 Click on **Formulas**, then click on **[OK]**
All cells containing formulas will be selected

1

	A	B	C	D	E
1	Alpheius Global Enterprises				
2	Shop Sales for Month of:			10%	5%
3					
4	Catalogue No	Model	Wholesale	Sale Price	Units Sold
5					
6	Communications				
7	TEL00001	World Communicator 223	56.77	83.00	15

2

3

	C	D	E	F	G	H	I
4	Wholesale	Sale Price	Units Sold	Gross Profit	Net Profit	Projected Sales	Projected Net Profit
5							
6							
7	56.77	83.00	15	1,245.00	393.45	15	393.45
8	122.50	178.00	12	2,136.00	666.00	12	666.00
9	677.99	984.00	11	10,824.00	3,366.11	11	3,366.11
10	76.00	111.00	34	3,774.00	1,190.00	35	1,225.00
11	144.55	210.00	56	11,760.00	3,665.20	58	3,796.10
12	455.50	661.00	43	28,423.00	8,836.50	45	9,247.50
13	566.78	822.00	22	18,084.00	5,614.84	23	5,870.06
14							

For Your Reference...

To **find formulas** using **Go To Special**:

1. Click on the **Home** tab, click on **Find & Select** in the **Editing** group, then select **Go To Special**
2. Click on **Formulas**
3. Click on **[OK]**

Handy to Know...

- You can select formulas by clicking on the **Home** tab, then clicking on **Find & Select** in the **Editing** group and selecting **formulas**.
- You can restrict the formula selection to only those formulas that result in numbers by ensuring that only **Numbers** appears with a tick in the **Go To Special** dialog box.

FINDING THE CURRENT REGION

The **Go To Special** dialog box can be used to select the **current region**, which is all of the cells adjacent to the current cell that contain an entry of some sort, such as text or formulas. This is

useful for selecting an entire list or any block of entries in a worksheet that is surrounded by blank columns and blank rows. The **current region** is a bit like an island in a sea of empty cells.

Try This Yourself:

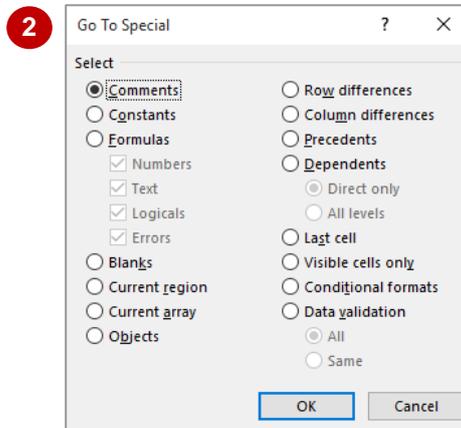
Same File

Continue using the previous file with this exercise, or open the file *Find And Replace_9.xlsx...*

- 1 Click in cell **A6** to position the cell pointer in the first main block of entries
- 2 On the **Home** tab, click on **Find & Select** in the **Editing** group and select **Go To Special** to display the **Go To Special** dialog box
- 3 Click on **Current region** then click on **[OK]**
The first block of adjacent figures and text will be selected

1

	A	B	C	D	E
1	Alpheius Global Enterprises				
2	Shop Sales for Month of:			10%	5%
3					
4	Catalogue No	Model	Wholesale	Sale Price	Units Sold
5					
6	Communications				
7	TEL00001	World Communicator 223	56.77	83.00	15
8	TEL00002	Planet Tamer 34e	122.50	178.00	12
9	TEL00003	Master Communicator 10 Plus	677.99	984.00	11
10	TEL00005	GR 514	76.00	111.00	34



3

	A	B	C	D	E
1	Alpheius Global Enterprises				
2	Shop Sales for Month of:			10%	5%
3					
4	Catalogue No	Model	Wholesale	Sale Price	Units Sold
5					
6	Communications				
7	TEL00001	World Communicator 223	56.77	83.00	15
8	TEL00002	Planet Tamer 34e	122.50	178.00	12
9	TEL00003	Master Communicator 10 Plus	677.99	984.00	11
10	TEL00005	GR 514	76.00	111.00	34

For Your Reference...

To **find** the **current region**:

1. On the **Home** tab click on **Find & Select** in the **Editing** group and select **Go To Special**
2. Click on **Current region**
3. Click on **[OK]**

Handy to Know...

- You can also select the current region by pressing **Ctrl** + **Shift** + *****.

FINDING THE LAST CELL

The **last cell** in a worksheet is, in theory, the right-most and lowest cell that contains data. When a worksheet is saved, only the part of the sheet that contains data or formatting is retained

to reduce the file size. Sometimes there can be a gap between the last cell containing data and what Excel thinks is the last cell, causing some rows and columns to be saved unnecessarily.

Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file *Find And Replace_10.xlsx...*

- 1 Press **Ctrl** + **Home** to select cell **A1** and deselect the current range
- 2 On the **Home** tab, click on **Find & Select** in the **Editing** group, then select **Go To Special** to display the **Go To Special** dialog box
- 3 Click on **Last cell**, then click on **[OK]**

The cell pointer will move to cell **I26**, but there doesn't appear to be any data in the cell. In this situation, this is as close as you can get because of the formatting that has been applied

	A	B	C	D	E	F	G	H	I	
1	Alpheius Global Enterprises									
2	Shop Sales for Month of:				10%	5%				
3										
4	Catalogue No	Model	Wholesale	Sale Price	Units Sold	Gross Profit	Net Profit	Projected Sales	Projected Net Profit	
5										
6	Communications									
7	TELO0001	World Communicator 223	56.77	83.00	15	1,245.00	393.45	15	393.45	
8	TELO0002	Planet Tamer 34e	122.50	178.00	12	2,136.00	666.00	12	666.00	
9	TELO0003	Master Communicator 10 Plus	677.99	984.00	11	10,824.00	3,366.11	11	3,366.11	
10	TELO0005	GR 514	76.00	111.00	34	3,774.00	1,190.00	35	1,225.00	
11	TELO0006	GR 515	144.55	210.00	56	11,760.00	3,665.20	58	3,796.10	
12	TELO0007	GR 516	455.50	661.00	43	28,423.00	8,836.50	45	9,247.50	
13	TELO0008	GR 517	566.78	822.00	22	18,084.00	5,614.84	23	5,870.06	
14										
15					Sub Total:	10,892.29	23,732.10		24,564.22	
16	Electronics									
17	ELEC00001	Home View 260	12.50	19.00	125	2,375.00	812.50	131	851.50	
18	ELEC00002	Home View 360	34.50	51.00	344	17,544.00	5,676.00	361	5,956.50	
19	ELEC00005	BroadBand 15	133.50	194.00	28	5,432.00	1,694.00	29	1,754.50	
20	ELEC00006	BroadBand 16	233.50	339.00	32	10,848.00	3,376.00	33	3,481.50	
21	ELEC00007	BroadBand 17	44.50	65.00	65	4,225.00	1,332.50	68	1,394.00	
22										
23					Sub Total:	8,084.80	12,891.00		13,438.00	
24										
25					Grand Total	9,488.54	36,623.10		38,002.22	
26										
27										

3

For Your Reference...

To **find** the **last cell**:

1. Click on the **Home** tab, click on **Find & Select** in the **Editing** group, then select **Go To Special**
2. Click on **Last cell**
3. Click on **[OK]**

Handy to Know...

- To find out more about the **last cell**, go to www.microsoft.com and search for Article ID **244435** entitled **How to reset the last cell in Excel**.

CHAPTER 4 FILTERING DATA

InFocus

You can use a spreadsheet to collect information and organise it into columns and rows within a table. This table can also be referred to as a **database**, and shares terminology with databases. Each **row** in the list is called a **record** and is one unit of information, e.g. an employee or an inventory item. Each **column** is known as a **field**, and each **column heading** is known as a **field name**, e.g. name or date of purchase.

Microsoft Excel provides a **Filter** function so that you can examine information in a table by requesting rows that match criteria or values. It works by hiding records that don't match the criteria you specify.

In this session you will:

- ✓ gain an understanding of filtering
- ✓ learn how to apply and use a filter
- ✓ learn how to clear a filter
- ✓ learn how to create a compound filter
- ✓ learn how to filter for multiple values
- ✓ learn how to set **Save** options
- ✓ learn how to set file locations.

UNDERSTANDING FILTERING

Filtering refers to comparing a list of records against specific criteria and then hiding the records that don't match the criteria. It can be used simply to help find a record, or to create a

subset of data that you can then edit, format, copy, move, chart or otherwise manipulate without affecting the other records. Here's a brief example of how simple filtering works.

An Example of Filtering

Here is a list of 65 records in a table. The field names appear at the top and are *No*, *First Name*, *Last Name* and so on. After filtering using the criterion of **Type = Gold**, the list is reduced to the 16 records that have the word **Gold** in the **Type** column and the other records are hidden. Notice the row numbers on the left – these confirm that some of the rows are not visible

	A	B	C	D	E	F	G	H
1	Membership							
2								
3	No	First Name	Last Name	Joined	Year	Suburb	Type	Annual F
4	1	Roger	Wilson	12/01/1988	27.8	Brighton	Gold	1,125.50
5	2	Mary	Driscoll	23/02/1998	17.7	South Melbourne	Theatre	850.00
6	3	Kate	Fu	2/02/1988	27.8	Bentleigh	Silver	750.00
7	4	Julie	Gregory	5/02/1988	27.8	Ascot Vale	Junior	55.00
8	5	Peter	Harrison	11/02/1988	27.8	Traralgon	Theatre	850.00
9	6	Harold	Lowe	20/02/1988	27.7	Sunshine	Theatre	850.00
10	7	Oscar	Renn	24/02/1988	27.7	Moonee Ponds	Silver	750.00
11	8	Melinda	Wrill	27/02/1988	27.7	Bentleigh	Gold	1,125.50
12	9	Fred	Jackson	4/03/1988	27.7	Brighton	Life	55.00
13	10	Mary	Lewis	13/03/1988	27.7	Christmas Hills	Gold	1,125.50
14	11	Katherine	Smith	17/04/1989	26.6	Endeavour Heights	Junior	55.00
15	12	June	Gregson	20/04/1989	26.6	Heidelberg Heights	Theatre	850.00
16	13	Auguste	Smythe	26/04/1989	26.5	Ivanhoe	Junior	55.00
17	14	Harry						
18	15	Wilbur						
19	16	Donald						
20	17	Shelly						
21	18	Samantha						
22	19	Louise						
23	20	Martin						
24	21	Bernard						
25	22	Brenda						
26	23	Jim						

	A	B	C	D	E	F	G	H
1	Membership							
2								
3	No	First Name	Last Name	Joined	Year	Suburb	Type	Annual F
4	1	Roger	Wilson	12/01/1988	27.8	Brighton	Gold	1,125.50
11	8	Melinda	Wrill	27/02/1988	27.7	Bentleigh	Gold	1,125.50
13	10	Mary	Lewis	13/03/1988	27.7	Christmas Hills	Gold	1,125.50
17	14	Harry	Jones	5/05/1989	26.5	Denis	Gold	1,125.50
22	19	Louise	Vincenzo	3/07/1990	25.4	Watsonia	Gold	1,125.50
27	24	Jennifer	Jones	31/08/1991	24.2	Echuca	Gold	1,125.50
28	25	George	Smith	9/09/1991	24.2	Mildura	Gold	1,125.50
31	28	John	Lux	28/10/1992	23.0	Allandale	Gold	1,125.50
32	29	Greg	Tantra	3/11/1992	23.0	Echuca	Gold	1,125.50
41	38	Quentin	Charles	26/02/1995	20.7	Ferntree Gully	Gold	1,125.50
43	40	Stephen	Adams	10/03/1995	20.7	Princes Park	Gold	1,125.50
48	45	Dennis	Georges	10/05/1996	19.5	Fitzroy	Gold	1,125.50
50	47	Martin	Branson	25/05/1996	19.5	South Melbourne	Gold	1,125.50
54	51	James	Lewis	17/07/1997	18.3	Rosanna	Gold	1,125.50
57	54	Yu	Krik	7/08/1997	18.3	Wallan	Gold	1,125.50
67	64	Mary	Jenkins	12/02/1999	16.7	Victor Harbour	Gold	1,125.50
68								
69								
70								
71								
72								
73								
74								

APPLYING AND USING A FILTER

The **Filter** command applies (or removes) drop arrows to the right of the column labels in the list. When you click on a **Filter** arrow, it displays a list of the unique items in the column, including

blanks and non-blanks. By selecting an item from a list for a specific column, you can instantly hide all rows that don't contain the selected value, and display only those that do.

Try This Yourself:

Open File

Before starting this exercise you **MUST** open the file *Filtering Data_1.xlsx...*

- 1 Click anywhere in the list
The values in Years in your worksheet may vary from those shown here because Years updates automatically to show the current duration of membership...
- 2 Click on the **Data** tab, then click on **Filter** in the **Sort & Filter** group
- 3 Click on the filter arrow to the right of **Type** to display a list of options
- 4 Click on **(Select All)** to remove all of the ticks, then click on **Gold** and click on **[OK]**
All records for Gold memberships will be shown and the rest of the records temporarily hidden.
Notice that the drop arrow next to Type has changed indicating that a filter is active on this column

1

Membership								
No	First Name	Last Name	Joined	Years	Suburb	Type	Annual Fee	
1	Roger	Wilson	12/01/1988	27.8	Brighton	Gold	1,125.50	
2	Mary	Driscoll	23/02/1998	17.7	South M	Theatre	850.00	
3	Kate	Fu	2/02/1988	27.8	Bentleig	Silver	750.00	
4	Julie	Gregory	5/02/1988	27.8	Ascot Va	Junior	55.00	
5	Peter	Harrison	11/02/1988	27.8	Traralgoi	Theatre	850.00	

3

Membership								
No	First Name	Last Name	Joined	Years	Suburb	Type	Annual Fee	
1	Roger	Wilson	12/01/1988	27.8	Brighton	Gold	1,125.50	
2	Mary	Driscoll	23/02/1998	17.7	South M	Theatre	850.00	
3	Kate	Fu	2/02/1988	27.8	Bentleig	Silver	750.00	
4	Julie	Gregory	5/02/1988	27.8	Ascot Va	Junior	55.00	
5	Peter	Harrison	11/02/1988	27.8	Traralgoi	Theatre	850.00	
6	Harold	Lowe					850.00	
7	Oscar	Renn					750.00	
8	Melinda	Wrill					1,125.50	
9	Fred	Jackson					55.00	
10	Mary	Lewis					1,125.50	
11	Katherine	Smith					55.00	
12	June	Gregson					850.00	
13	Auguste	Smythe					55.00	
14	Harry	Jones					1,125.50	
15	Wilbur	Johnson					750.00	
16	Donald	Kendall					750.00	
17	Shelly	Lewis					55.00	
18	Samantha	Martin					750.00	
19	Louise	Vincenzo					1,125.50	
20	Martin	Pollard					750.00	
21	Bernard	Olinda	18/07/1990	25.3	Ferntree	Junior	55.00	

4

Membership								
No	First Name	Last Name	Joined	Years	Suburb	Type	Annual Fee	
1	Roger	Wilson	12/01/1988	27.8	Brighton	Gold	1,125.50	
8	Melinda	Wrill	27/02/1988	27.7	Bentleig	Gold	1,125.50	
10	Mary	Lewis	13/03/1988	27.7	Christma	Gold	1,125.50	
14	Harry	Jones	5/05/1989	26.5	Denis	Gold	1,125.50	
19	Louise	Vincenzo	3/07/1990	25.4	Watsoni	Gold	1,125.50	

For Your Reference...

To **turn** the **filter on** or **off**:

- Click in the data, click on the **Data** tab, then click on **Filter** in the **Sort & Filter** group

To **apply** a **simple filter**:

- Click on a filter arrow, click on **(Select All)**, then click on an option and click on **[OK]**

Handy to Know...

- If the column that you want to filter includes blank cells, you will also have the option **(Blanks)** to choose from. This can be used to help you locate missing data.

CLEARING A FILTER

Once a filter has been applied, a subset of data is shown in the list. Before you can apply an alternative filter, the first one must be cleared so that all of the records become available again.

Filters can be cleared either by clicking on **(Select All)** in the filter options list or by selecting **Clear Filter From "fieldname"** from the menu. You can also remove the filter arrows altogether.

Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file *Filtering Data_2.xlsx*...

- 1 Examine the list of records in the spreadsheet

You'll notice that it is currently filtered on Gold under Type...

- 2 Click on the filter arrow for **Type** and select **Clear Filter From "Type"**

All of the records will again be listed. You can also remove the filter altogether...

- 3 Ensure the **Data** tab is active, then click on **Filter** in the **Sort & Filter** group to remove the filter arrows

1

	A	B	C	D	E	F	G	H
1	Membership							
2								
3	No	First Name	Last Name	Joined	Years	Suburb	Type	Annual Fee
4	1	Roger	Wilson	12/01/1988	27.8	Brighton	Gold	1,125.50
11	8	Melinda	Wright	27/02/1988	27.7	Bentleigh	Gold	1,125.50
13	10	Mary	Lewis	13/03/1988	27.7	Christm	Gold	1,125.50
17	14	Harry	Jones	5/05/1989	26.5	Denis	Gold	1,125.50
22	19	Louise	Vincenzo	3/07/1990	25.4	Watson	Gold	1,125.50
27	24	Jennifer	Jones	31/08/1991	24.2	Echuca	Gold	1,125.50
28	25	George	Smith	9/09/1991	24.2	Mildura	Gold	1,125.50

2

	A	B	C	D	E	F	G	H
1	Membership							
2								
3	No	First Name	Last Name	Joined	Years	Suburb	Type	Annual Fee
4	1	Roger	Wilson	12/01/1988	27.8	Brighton	Gold	1,125.50
5	2	Mary	Driscoll	23/02/1998	17.7	South M	Theatre	850.00
6	3	Kate	Fu	2/02/1988	27.8	Bentleigh	Silver	750.00
7	4	Julie	Gregory	5/02/1988	27.8	Ascot Va	Junior	55.00
8	5	Peter	Harrison	11/02/1988	27.8	Traralgon	Theatre	850.00
9	6	Harold	Lowe	20/02/1988	27.7	Sunshine	Theatre	850.00
10	7	Oscar	Renn	24/02/1988	27.7	Moonee	Silver	750.00

3

	A	B	C	D	E	F	G	H
1	Membership							
2								
3	No	First Name	Last Name	Joined	Years	Suburb	Type	Annual Fee
4	1	Roger	Wilson	12/01/1988	27.8	Brighton	Gold	1,125.50
5	2	Mary	Driscoll	23/02/1998	17.7	South M	Theatre	850.00
6	3	Kate	Fu	2/02/1988	27.8	Bentleigh	Silver	750.00
7	4	Julie	Gregory	5/02/1988	27.8	Ascot Va	Junior	55.00
8	5	Peter	Harrison	11/02/1988	27.8	Traralgon	Theatre	850.00
9	6	Harold	Lowe	20/02/1988	27.7	Sunshine	Theatre	850.00
10	7	Oscar	Renn	24/02/1988	27.7	Moonee	Silver	750.00

For Your Reference...

To **clear** the **filter**:

1. Click on the filter arrow
2. Select **Clear Filter From "fieldname"**

To **remove** the **filter arrows**:

- Click on the **Data** tab, then click on **Filter** in the **Sort & Filter** group

Handy to Know...

- You can remove the filter altogether in one step by clicking on **Filter**. Use the **Clear Filter From** command when you want to perform subsequent filters.

CREATING COMPOUND FILTERS

The **Filter** tool allows you to select a filter on one column or field at a time. When the filter is applied, the records that match that filter will be displayed. As you create successive filters on

other fields, the filters are applied to only the records that are currently on display. In other words, the filters build up on each other, or **compound**, refining the list as required.

Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file *Filtering Data_3.xlsx...*

1 Click anywhere in the list, ensure the **Data** tab is active, then click on **Filter** in the **Sort & Filter** group to display the filter arrows

2 Click on the filter arrow for **Type** and click on **(Select All)**, then click on **Theatre** and click on **[OK]**

Only the records for Theatre are displayed...

3 Click on the filter arrow for **Suburb**, click on **(Select All)**, click on **Heidelberg Heights**, then click on **[OK]**

Only the Theatre members in Heidelberg Heights are now shown. Let's see if there are other members who live in Heidelberg Heights...

4 Click on the filter arrow for **Type** and select **Clear Filter From "Type"**

Now that the list is filtered to show all Types in Heidelberg Heights, a Junior member is also listed...

5 Click on the filter arrow for **Suburb** and select **Clear Filter From "Suburb"**

	A	B	C	D	E	F	G	H
1	Membership							
2								
3	No	First Name	Last Name	Joined	Year	Suburb	Type	Annual Fee
5	2	Mary	Driscoll	23/02/1998	17.7	South M	Theatre	850.00
8	5	Peter	Harrison	11/02/1988	27.8	Traralgon	Theatre	850.00
9	6	Harold	Lowe	20/02/1988	27.7	Sunshine	Theatre	850.00
15	12	June	Gregson	20/04/1989	26.6	Heidelberg	Theatre	850.00
34	31	Susan	Quill	17/12/1993	21.9	Reservoir	Theatre	850.00
35	32	Denise	Adams	20/12/1993	21.9	Heidelberg	Theatre	850.00
36	33	Driscoll	Samson	26/12/1993	21.9	Rosanna	Theatre	850.00

2

	A	B	C	D	E	F	G	H
1	Membership							
2								
3	No	First Name	Last Name	Joined	Year	Suburb	Type	Annual Fee
15	12	June	Gregson	20/04/1989	26.6	Heidelberg	Theatre	850.00
35	32	Denise	Adams	20/12/1993	21.9	Heidelberg	Theatre	850.00
55	52	Terry	Youll	23/07/1997	18.3	Heidelberg	Theatre	850.00
68								
69								

3

	A	B	C	D	E	F	G	H
1	Membership							
2								
3	No	First Name	Last Name	Joined	Year	Suburb	Type	Annual Fee
4	1	Roger	Wilson	12/01/1988	27.8	Brighton	Gold	1,125.50
5	2	Mary	Driscoll	23/02/1998	17.7	South M	Theatre	850.00
6	3	Kate	Fu	2/02/1988	27.8	Bentleigh	Silver	750.00
7	4	Julie	Gregory	5/02/1988	27.8	Ascot Va	Junior	55.00
8	5	Peter	Harrison	11/02/1988	27.8	Traralgon	Theatre	850.00
9	6	Harold	Lowe	20/02/1988	27.7	Sunshine	Theatre	850.00
10	7	Oscar	Renn	24/02/1988	27.7	Moonee	Silver	750.00

5

For Your Reference...

To **create** a **compound filter**:

1. Apply the first filter to the list to display a subset of the records
2. Apply a second filter to the list to show a subset of the subset of records

Handy to Know...

- When you print a filtered list, Excel will print the list as shown in the worksheet, with all of the unwanted records hidden.

MULTIPLE VALUE FILTERS

You may want to list records by creating two criteria for one field so that you can select records with one of two possible values. For example, you may want to see all the records for

two particular suburbs, or two membership types. The filter options list all of the unique values found in that field in the list, so you can click on any of the values that you want to display.

Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file *Filtering Data_4.xlsx...*

- 1 Click on the filter arrow for **Suburb** and click on **(Select All)** to remove the ticks
- 2 Click on **Ascot Vale** and **Bentleigh** so that ticks appear next to both items
- 3 Click on **[OK]** to display the filtered list
Only those records with Ascot Vale or Bentleigh in the Suburb are listed...
- 4 Click on the filter arrow for **Suburb** and select **Clear Filter From "Suburb"** to list all of the records

2

Membership							
No	First Name	Last Name	Joined	Year	Suburb	Type	Annual Fee
1	Roger					Gold	1,125.50
2	Mary					Theatre	850.00
3	Kate					Silver	750.00
4	Julie					Junior	55.00
5	Peter					Theatre	850.00
6	Harold					Theatre	850.00
7	Oscar					Silver	750.00
8	Melinda					Gold	1,125.50
9	Fred					Life	55.00
10	Mary					Gold	1,125.50
11	Katherine					Junior	55.00
12	June					Theatre	850.00
13	Auguste					Junior	55.00
14	Harry					Gold	1,125.50
15	Wilbur					Silver	750.00
16	Donald					Silver	750.00
17	Shelly					Life	55.00
18	Samantha					Silver	750.00
19	Louise					Gold	1,125.50
20	Martin					Silver	750.00
21	Bernard	Olinda	18/07/1990	25.3	Ferntree	Junior	55.00

3

Membership							
No	First Name	Last Name	Joined	Year	Suburb	Type	Annual Fee
3	Kate	Fu	2/02/1988	27.8	Bentleigh	Silver	750.00
4	Julie	Gregory	5/02/1988	27.8	Ascot Va	Junior	55.00
8	Melinda	Wriill	27/02/1988	27.7	Bentleigh	Gold	1,125.50
36	Charles	Peterson	19/01/1994	21.8	Bentleigh	Silver	750.00

For Your Reference...

To **filter** on **multiple values**:

1. Click on the filter arrow for the required field
2. Click on **(Select All)**
3. Click on the checkboxes for each of the values that you want to filter by
4. Click on **[OK]**

Handy to Know...

- Using multiple values in criteria is the same as saying, for example, if Suburb = Ascot Vale **OR** Suburb = Bentleigh.
- If the field is a date field, you can filter on specific years, specific months or even specific dates. These are all provided for easy access in the filter menu.

CREATING CUSTOM FILTERS

The **Filter** feature enables you to create individual conditions for multiple fields using the drop-down lists. To set more than one condition per field you can use the **Custom Filter** option.

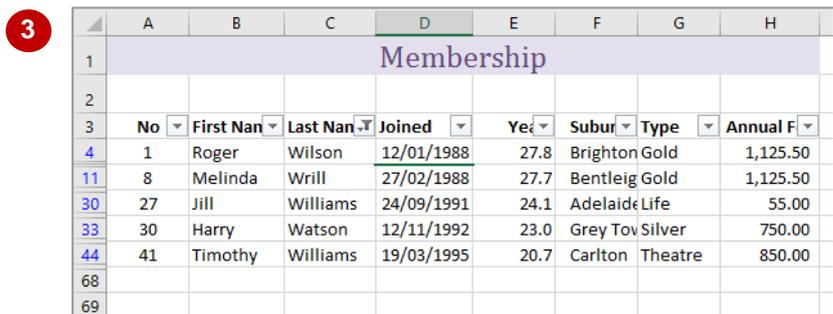
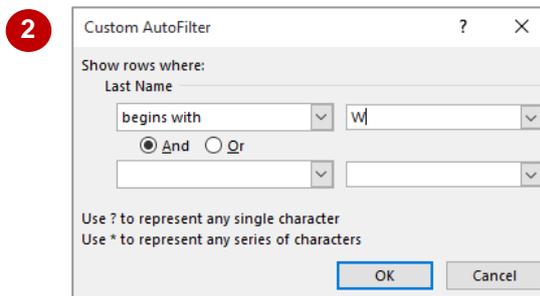
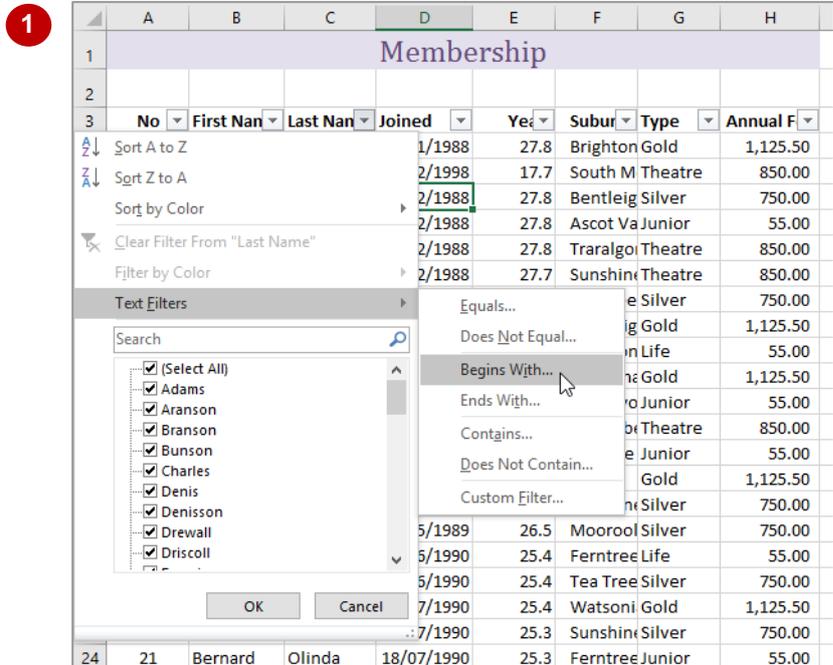
This is ideal if you want to select records with one of several possible values, or where you want a record that falls within a range of values rather than matching an exact value.

Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file *Filtering Data_5.xlsx...*

- 1 Click on the filter arrow for **Last Name**, point to **Text Filters**, then select **Begins With**
The Custom AutoFilter dialog box will display...
- 2 Type **W**, as shown
- 3 Click on **[OK]** to filter the list so that all members with last names beginning with **W** are listed
- 4 Repeat steps 1 to 3 to create a list of members whose surnames start with **S**
- 5 Click on the filter arrow for **Last Name** and select **Clear Filter from "Last Name"**



For Your Reference...

To **create** a **custom filter**:

1. Click on the filter arrow for the field
2. Select **FieldType Filters** > [option]
3. Type the filter criteria
4. Click on **[OK]**

Handy to Know...

- If you are not sure how to spell a word, but know that it includes particular letters, you can search using the criteria **contains**.
- Each of the **equals**, **contains**, **begins with**, and **ends with** criteria have an opposite choice e.g., **does not equal**, **does not contain** etc.

USING WILDCARDS

If you need to filter for specific values in a list, you can select them individually from the filter menu or use **wildcards** to create a more powerful filter. Wildcards are characters that can

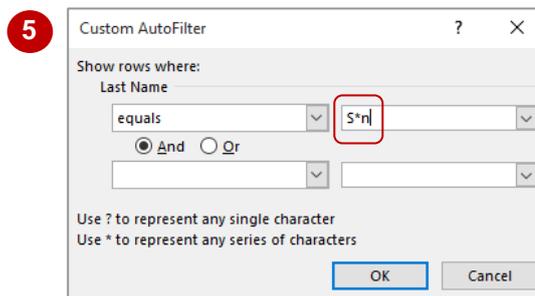
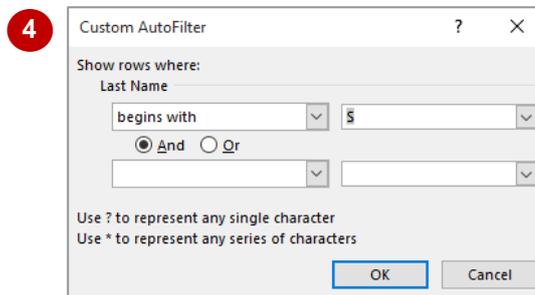
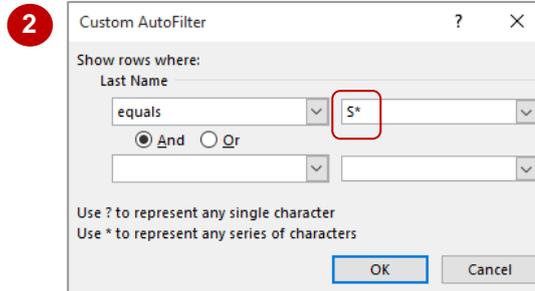
be substituted for any character (?) or series of characters (*). For example, **B*N** would find all words starting with B and ending with N, while **B?N** would find the same, but look for three letters.

Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file *Filtering Data_6.xlsx*...

- 1 Click on the filter arrow for **Last Name**, point to **Text Filters**, then select **Custom Filter** to display the **Custom AutoFilter** dialog box
- 2 Type **S***
- 3 Click on **[OK]** to see the members whose names begin with the letter **S**
- 4 Repeat step 1 to display the **Custom AutoFilter** dialog box
- Notice that Excel changed your criteria so that it now reads "begins with S"...
- 5 Click on the drop arrow below **Last Name**, scroll up and select **equals**, then click in the field to the right of **S** and type ***n**
- 6 Click on **[OK]** to see the names that begin with **S** and end with **n**
- 7 Click on the filter arrow for **Last Name** and select **Clear Filter From "Last Name"** to display all of the records



	A	B	C	D	E	F	G	H
1	Membership							
2								
3	No	First Name	Last Name	Joined	Year	Suburb	Type	Annual Fee
36	33	Driscoll	Samson	26/12/1993	21.9	Rosanna	Theatre	850.00
62	59	Tom	Samson	5/10/1998	17.1	Maribyrn	Junior	55.00
68								
69								

6

For Your Reference...

To use **wildcards** in **custom criteria**:

1. Click on a filter arrow, then point to **Text Filters**
2. Select **Custom Filter**
3. Enter a criteria with either an ***** or a **?** depending on what you are searching for

Handy to Know...

- You can filter for the question mark or asterisk character as the actual character itself, and not the wildcard character, by preceding the character with the **tilde** ~. For example, if you use the criteria **Year~?**, Excel will search for the character string **Year?**.

CHAPTER 5 **ADVANCED FILTERS**

InFocus

Worksheets can be used to keep lists of information such as employee details, subscribers, accounts, sales, or even bird sightings if need be.

The **Advanced Filter** in Excel enables you to analyse the data in a list by filtering it according to specific criteria.

In this session you will:

- ✓ gain an understanding of advanced filtering
- ✓ learn how to use an advanced filter
- ✓ learn how to extract records using an advanced filter
- ✓ learn how to use formulas in criteria
- ✓ gain an understanding of the database functions available
- ✓ learn how to use database functions
- ✓ learn how to use the **DSUM** function
- ✓ learn how to use the **DMIN** function
- ✓ learn how to use the **DMAX** function
- ✓ learn how to use the **DCOUNT** function.

UNDERSTANDING ADVANCED FILTERING

To work with **Advanced Filters** in Excel, you need to understand a few of the concepts that are used. A list in Excel is a series of rows of information. Each row is effectively one unit of

information. This structure is very similar to a simple database and therefore Excel uses similar terminology to describe the parts of the list. The following illustrates a list and its parts.

Fields, Field Names and Records

A **field** is a **column** in the list of data. In the example below, the column of data for the **Last Name** is an example of a field.

The **field name** is the **heading** at the top of the column. The field names within one list must be unique. In the example below, the text **Annual Fee** is an example of a field name.

A **record** is a **row** of data in the list. Each record is one item of data in the list. In the example below, the row of information for **Fred Jackson** is one record. Note that advanced filters do not work correctly if there are blank rows in the list.

The diagram shows a table with 8 columns: No, First Name, Last Name, Joined, Years, Suburb, Type, and Annual Fee. Red boxes highlight the 'Last Name' column (labeled 'Field'), the 'Annual Fee' header (labeled 'Field Name'), and the entire row for 'Fred Jackson' (labeled 'Record').

No	First Name	Last Name	Joined	Years	Suburb	Type	Annual Fee
1	Roger	Wilson	12/01/1998	16.0	Brighton	Gold	1,125.50
2	Mary	Driscoll	23/02/1998	15.9	South Melbourne	Theatre	850.00
3	Kate	Fu	2/02/1998	15.9	Bentleigh	Silver	750.00
4	Julie	Gregory	5/02/1998	15.9	Ascot Vale	Junior	55.00
5	Peter	Harrison	11/02/1998	15.9	Traralgon	Theatre	850.00
6	Harold	Lowe	20/02/1998	15.9	Sunshine	Theatre	850.00
7	Oscar	Renn	24/02/1998	15.9	Moonee Ponds	Silver	750.00
8	Melinda	Wrill	27/02/1998	15.9	Bentleigh	Gold	1,125.50
9	Fred	Jackson	4/03/1998	15.9	Brighton	Life	55.00
10	Mary	Lewis	13/03/1998	15.8	Christmas Hills	Gold	1,125.50

Criteria, Criteria Range, AND and OR

Criteria are tests against the data in specific fields, for instance **Gold**. When **Gold** is tested against the field **Type**, the filter would display only the people with **Gold** memberships. All other records are filtered out (hidden).

The **criteria range** is the area where you specify the criteria. The first row contains the field names that mirror those in the list. The second and subsequent rows are used to type the criteria or examples of what you are looking for in the list.

If you want the conditions between fields joined with an **AND**, you write the conditions on the same row. If you want them joined with an **OR**, you write the conditions on separate rows. In the next example, our criteria specifies greater than **15** years membership **AND Gold** membership.

The diagram shows a criteria range table with two rows. The first row contains field names: 'Years' and 'Type'. The second row contains the criteria: '>=15' and 'Gold'. A red box highlights the entire criteria range. Below it is a table showing the filtered results.

Membership Renewals	Years	Type
	>=15	Gold

No	First Name	Last Name	Joined	Years	Suburb	Type	Annual Fee
1	Roger	Wilson	12/01/1988	26.0	Brighton	Gold	1,125.50
8	Melinda	Wrill	27/02/1988	25.9	Bentleigh	Gold	1,125.50
10	Mary	Lewis	13/03/1988	25.9	Christmas Hills	Gold	1,125.50
14	Harry	Jones	5/05/1989	24.7	Denis	Gold	1,125.50
19	Louise	Vincenzo	3/07/1990	23.6	Watsonia	Gold	1,125.50

USING AN ADVANCED FILTER

To use an **Advanced Filter**, you need to create a criteria area, enter your criteria, specify the list to be filtered and then run the filter. The **Advanced Filter** tool has one distinct advantage over other

filtering techniques (such as AutoFilter), you type your criteria directly into the worksheet. The criteria are always visible in the worksheet above the records that you have filtered.

Try This Yourself:

Open File

Before starting this exercise you **MUST** open the file *Advanced Filters_1.xlsx...*

- 1 Study the list of records to familiarise yourself with the data
First we need to add criteria...
- 2 Type the labels and values in the range **D2:E3** as shown
The criteria reads “where Years are greater than or equal to 20 AND the Type is Silver”. Now to apply the filter...
- 3 Click in cell **E6** so that Excel can locate the list
- 4 Click on the **Data** tab, then click on **Advanced** in the **Sort & Filter** group to display the **Advanced Filter** dialog box
The List range is automatically selected...
- 5 Click in **Criteria range**, then type **D2:E3**
- 6 Click on **[OK]**
Only the records matching the criteria will be displayed...
- 7 On the **Data** tab, click on **Clear** in the **Sort & Filter** group to restore the list

	A	B	C	D	E	F	G	H
1								
2		Membership Renewals		Years	Type			
3				>=20	Silver			
4								
5								
6	No	First Name	Last Name	Joined	Years	Suburb	Type	Annual Fee
7	1	Roger	Wilson	12/01/1988	27.9	Brighton	Gold	1,125.50
8	2	Mary	Driscoll	23/02/1998	17.7	South Melbourne	Theatre	850.00
9	3	Kate	Fu	2/02/1988	27.8	Bentleigh	Silver	750.00
10	4	Julie	Gregory	5/02/1988	27.8	Ascot Vale	Junior	55.00
11	5	Peter	Harrison	11/02/1988	27.8	Traralgon	Theatre	850.00
12	6	Harold	Lowe	20/02/1988	27.7	Sunshine	Theatre	850.00

2

4

5

	A	B	C	D	E	F	G	H
2		Membership Renewals		Years	Type			
3				>=20	Silver			
4								
5								
6	No	First Name	Last Name	Joined	Years	Suburb	Type	Annual Fee
9	3	Kate	Fu	2/02/1988	27.8	Bentleigh	Silver	750.00
13	7	Oscar	Renn	24/02/1988	27.7	Moonee Ponds	Silver	750.00
21	15	Wilbur	Johnson	11/05/1989	26.5	Sunshine	Silver	750.00
22	16	Donald	Kendall	20/05/1989	26.5	Mooroolbark	Silver	750.00
24	18	Samantha	Martin	27/06/1990	25.4	Tea Tree Hill	Silver	750.00
26	20	Martin	Pollard	9/07/1990	25.4	Sunshine	Silver	750.00

6

For Your Reference...

To use the **Advanced Filter**:

1. Create the criteria range
2. Click in the list to be filtered
3. Click on the **Data** tab, then click on **Advanced** in the **Sort & Filter** group
4. Type the **Criteria range**, then click on **[OK]**

Handy to Know...

- When using the **Advanced Filter** dialog box, if you can't remember the range of cells that hold certain values (e.g. **Criteria range**), you can click on **Collapse Dialog** which moves the focus to the workbook, enabling you to select the actual cells on the relevant worksheet.

EXTRACTING RECORDS WITH ADVANCED FILTER

The **Advanced Filter** can be used to filter a list in place (hiding unwanted records) or to extract required records and paste them in another location. By creating a subset of the list, you can

further analyse the data without risking accidental modifications of the original list. You must specify the fields that you want and the location where the records are to be copied.

Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file *Advanced Filters_2.xlsx...*

- 1 Scroll down to and click in cell **C75**
This is a blank cell which appears below the list...
- 2 Type the field headings as shown
These are the fields that we want to extract according to the criteria listed at the top of the worksheet...
- 3 Click anywhere in the original list
- 4 Click on the **Data** tab then click on **Advanced** in the **Sort & Filter** group
- 5 Under **Action** click on **Copy to another location**
- 6 Click in **Copy to** and type **C75:F75**
- 7 Click on **[OK]**, then scroll down and examine the extracted data

	A	B	C	D	E	F	G	H
69	63	Cathy	Victor	8/12/1998	16.9	Heidelberg Heights	Junior	55.0
70	64	Mary	Jenkins	12/02/1999	16.8	Victor Harbour	Gold	1,125.5
71								
72								
73								
74								
75			Last Name	Years	Annual Fee	Suburb		
76								
77								
78								
79								

2

5

Advanced Filter ? X

Action

Filter the list, in-place

Copy to another location

List range: SAS6:SH570

Criteria range: SDS2:SES3

Copy to:

Unique records only

OK Cancel

6

Advanced Filter ? X

Action

Filter the list, in-place

Copy to another location

List range: SAS6:SH570

Criteria range: SDS2:SES3

Copy to: C75:F75

Unique records only

OK Cancel

	A	B	C	D	E	F	G	H
69	63	Cathy	Victor	8/12/1998	16.9	Heidelberg Heights	Junior	55.00
70	64	Mary	Jenkins	12/02/1999	16.8	Victor Harbour	Gold	1,125.50
71								
72								
73								
74								
75			Last Name	Years	Annual Fee	Suburb		
76			Fu	27.8	750.00	Bentleigh		
77			Renn	27.7	750.00	Moonee Ponds		
78			Johnson	26.5	750.00	Sunshine		
79			Kendall	26.5	750.00	Mooroolbark		
80			Martin	25.4	750.00	Tea Tree Hill		
81			Pollard	25.4	750.00	Sunshine		
82			Peters	24.2	750.00	South Melbourne		
83			Watson	23.0	750.00	Grey Towers		
84			Peters	21.9	750.00	Brighton		
85			Peterson	21.8	750.00	Bentleigh		
86			Bunson	20.7	750.00	Sunshine		
87			Zollan	20.7	750.00	Endeavour Heights		
88								

7

For Your Reference...

To **extract records using the Advanced Filter**:

1. Create the criteria and extract ranges
2. Click on the **Data** tab, then click on **Advanced** in the **Sort & Filter** group
3. Click on **Copy to another location**
4. Type the **Criteria range** and **Copy to** range, then click on **[OK]**

Handy to Know...

- You can use the extract feature of the **Advanced Filter** to create a list of unique codes that are used in a list. For example, to create a list of **Type** codes, extract the **Type** field with no criteria and select the checkbox **Unique records only** in the **Advanced Filter** dialog box.

USING FORMULAS IN CRITERIA

By making slight adjustments to the criteria range and using a formula for the criteria, you can create more sophisticated filters. The first row of the criteria range must contain a label that is not

the same as a field heading. The criteria example in the second row must be expressed as a **formula**. The formula often makes a comparison using the first record as a model for all others.

Try This Yourself:

Same File

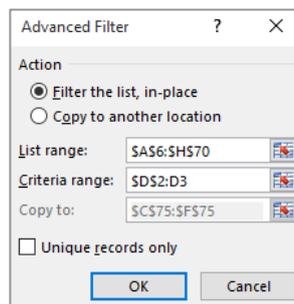
Continue using the previous file with this exercise, or open the file *Advanced Filters_3.xlsx*...

- 1 Delete the contents of cells **D2:E3**
- 2 Type the headings **AveMem** in cell **D2** and **Average Membership** in cell **F2** as shown, then enter these formulas:
 in **F3** **=AVERAGE(E7:E70)**
 in **D3** **=E7>\$F\$3**
 The formula in **F3** calculates the average Years (20.4), then the formula in **D3** tests the Years of the first record against the average. If the Years are higher than the average, the answer is **TRUE**. Let's now extract the matching records...
- 3 Click in the list, then click on the **Data** tab
- 4 Click on **Advanced** in the **Sort & Filter** group, then double-click on **\$E\$3** in **Criteria range** and type **D3**
- 5 Click on **Copy to another location** in **Action** – we'll use the same **Copy to** cell range
- 6 Click on **[OK]**, then scroll down to examine the extracted data

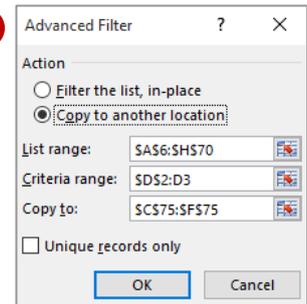
No	First Name	Last Name	Joined	Years	Suburb	Type	Annual F
1	Roger	Wilson	12/01/1988	27.9	Brighton	Gold	1,125.5

2

4



5



Last Name	Years	Annual Fee	Suburb
Wilson	27.9	1,125.50	Brighton
Fu	27.8	750.00	Bentleigh
Gregory	27.8	55.00	Ascot Vale
Harrison	27.8	850.00	Traralgon
Lowe	27.7	850.00	Sunshine
Renn	27.7	750.00	Moonee Ponds
Wrill	27.7	1,125.50	Bentleigh
Jackson	27.7	55.00	Brighton
Lewis	27.7	1,125.50	Christmas Hills
Smith	26.6	55.00	Endeavour Heights
Gregson	26.6	850.00	Heidelberg Heights
Smythe	26.6	55.00	Ivanhoe
Jones	26.5	1,125.50	Denis
Johnson	26.5	750.00	Sunshine
Kendall	26.5	750.00	Mooroolbark
Lewis	25.4	55.00	Ferntree Gully
Martin	25.4	750.00	Tea Tree Hill

6

For Your Reference...

To use formulas in criteria:

1. Type a **criteria heading** that does not match a field name
2. Create a formula (starting with =) below the heading that performs a comparison with the value of a field in the first record

Handy to Know...

- When you perform the **copy** operation during filtering, Excel names the header row of the copied records as **Extract**. It names the cells containing the criteria range as **Criteria**. You can use these names to navigate quickly to the extract or criteria ranges of the worksheet via the **Name** box.

UNDERSTANDING DATABASE FUNCTIONS

The **database functions** are functions that are specifically designed to perform calculations on records in a list without the need to filter them. The selection criteria are built into the functions

returning summary values without filtering the records. This page details the database functions, their purpose and their criteria.

The Database Functions

Function	Purpose
DAVERAGE	Averages the values in the field (column) of records in a database that match the criteria that you specify.
DCOUNT	Counts the cells containing numbers in the field of records in the database that match the criteria that you specify.
DCOUNTA	Counts the non-blank cells in the field of records in the database that match the criteria that you specify.
DGET	Extracts from the database a single record that matches the criteria that you specify.
DMAX	Returns the highest number from the field of records in the database that match the criteria that you specify.
DMIN	Returns the lowest number from the field of records in the database that match the criteria that you specify.
DPRODUCT	Multiplies the values in the field of records in a database that match the criteria you specify.
DSTDEV	Estimates the standard deviation based on a sample from the database entries that match the criteria that you specify.
DSTDEVP	Calculates the standard deviation from the entire population in a field of records in the database that match the criteria that you specify.
DSUM	Adds the values in the field of records in a database that match the criteria that you specify.
DVAR	Estimates the variance based on a sample from the database entries that match the criteria that you specify.
DVARP	Calculates the variance from the entire population in a field of records in the database that match the criteria that you specify.

Function Arguments

All database functions require the same three arguments:

Argument	Use
database	The range of cells that make up the list or database.
field	This is the column that the calculations will be performed upon. It is represented either by the label of the column in double quotation marks or by a number that represents the position of the column in the list.
criteria	The range of cells that contain the criteria, consisting of a column heading and a cell below the label containing the criteria.

USING DATABASE FUNCTIONS

The **Advanced Filter** can be used to show or extract a subset of records from a list for later analysis. An alternative to using the filter is to use the **database functions**. These functions are

specially designed to perform calculations on records without the need to filter them. The selection criteria are built into the functions, returning values without filtering the records.

Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file *Advanced Filters_4.xlsx...*

- 1 Delete the contents in the range **D2:F3**
- 2 Add the details to cells **E2, E3, G2, G3** and **G4** as shown
- 3 Type the formulas in the cells, as shown

The results for all records with less than 20 years membership are shown.

Your results may differ from those shown in the example as the data is based on the current date...

- 4 Click in cell **E7**, then click on the **Home** tab and click on **Format Painter** in the **Clipboard** group
- 5 Click and drag the mouse pointer over the range **H2:H5** to apply the formatting

	A	B	C	D	E	F	G	H
1								
2		Membership Renewals			Years		Total No	
3					<20		Sum	
4							Average	
5								
6	No	First Name	Last Name	Joined	Years	Suburb	Type	Annual F
7	1	Roger	Wilson	12/01/1988	27.9	Brighton	Gold	1,125.5
8	2	Mary	Driscoll	23/02/1998	17.7	South Melbourne	Theatre	850.0
9	3	Kate	Fu	2/02/1988	27.8	Bentleigh	Silver	750.0
10	4	Julie	Gregory	5/02/1988	27.8	Ascot Vale	Junior	55.0
11	5	Peter	Harrison	11/02/1988	27.8	Traralgon	Theatre	850.0
12	6	Harold	Lowe	20/02/1988	27.7	Sunshine	Theatre	850.0
13	7	Oscar	Renn	24/02/1988	27.7	Moonee Ponds	Silver	750.0
14	8	Melinda	Wrill	27/02/1988	27.7	Bentleigh	Gold	1,125.5
15	9	Fred	Jackson	4/03/1988	27.7	Brighton	Life	55.0
16	10	Mary	Lewis	13/03/1988	27.7	Christmas Hills	Gold	1,125.5
17	11	Katherine	Smith	17/04/1989	26.6	Endeavour Heights	Junior	55.0
18	12	June	Gregson	20/04/1989	26.6	Heidelberg Heights	Theatre	850.0
19	13	Auguste	Smythe	26/04/1989	26.6	Ivanhoe	Junior	55.0
20	14	Harvy	Jones	5/05/1989	26.5	Denis	Gold	1,125.5

2

Cell	Formula
H2	=DCOUNT(A6:H70,E6,E2:E3)
H3	=DSUM(A6:H70,E6,E2:E3)
H4	=DAVERAGE(A6:H70,E6,E2:E3)

	A	B	C	D	E	F	G	H
1								
2		Membership Renewals			Years		Total No	22.0
3					<20		Sum	399.2
4							Average	18.1
5								
6	No	First Name	Last Name	Joined	Years	Suburb	Type	Annual Fee
7	1	Roger	Wilson	12/01/1988	27.9	Brighton	Gold	1,125.50
8	2	Mary	Driscoll	23/02/1998	17.7	South Melbourne	Theatre	850.00
9	3	Kate	Fu	2/02/1988	27.8	Bentleigh	Silver	750.00
10	4	Julie	Gregory	5/02/1988	27.8	Ascot Vale	Junior	55.00
11	5	Peter	Harrison	11/02/1988	27.8	Traralgon	Theatre	850.00

5

For Your Reference...

DCOUNTA(database,field,criteria)

This function counts all of the nonblank cells in a **field** (column) in a **database** (list) that match the **criteria** (conditions) that you specify.

Database is the cell range for the list, **field** is the cell reference of the column heading, and **criteria** is the criteria range.

Handy to Know...

- There are twelve database functions including **DSUM**, **DPRODUCT**, **DCOUNT** and **DAVERAGE**. They all require the same parameters or information: **database**, **field** and **criteria**.

USING DSUM

The **DSUM function** is used to total the contents of cells in a specified field of a database, where the record matches the criteria specified. The criteria can be specified against one or more cells

and not necessarily against the column that is being totalled. The records are not filtered, rather a single total figure is calculated and displayed.

Try This Yourself:

Open File

Before starting this exercise you **MUST** open the file *Advanced Filters_5.xlsx...*

1

Click in cell **E3**, then type **Type**

This is the column that the criteria will operate on...

2

Click in cell **E4**, then type **Gold**

Our initial criterion is that the membership type must be Gold...

3

Click in cell **G3**, then type **Total**

This is a label for our database...

4

Click in cell **H3**, type **=DSUM(A8:H72,H8,E3:E4)**, then press

5

Click in cell **H9**, click on the **Home** tab, click on **Format Painter** in the **Clipboard** group, then click in cell **H3**

6

Click in cell **E4**, type **Silver** and press

The Total of the database function will recalculate...

7

Repeat step 6 with the values:
Junior
Theatre
no criteria (i.e. leave blank)

	A	B	C	D	E	F	G	H
1					Criteria		Database Functions	
2								
3					Type		Total	18008.0
4					Gold			
5								
6					Membership Renewals			
7								
8	No	First Name	Last Name	Joined	Years	Suburb	Type	Annual Fee
9	1	Roger	Wilson	12/01/1998	17.9	Brighton	Gold	1,125.50
10	2	Mary	Driscoll	23/02/1998	17.7	South Melbourne	Theatre	850.00
11	3	Kate	Fu	2/02/1998	17.8	Bentleigh	Silver	750.00

4

	A	B	C	D	E	F	G	H
1					Criteria		Database Functions	
2								
3					Type		Total	11,250.00
4					Silver			
5								
6					Membership Renewals			
7								
8	No	First Name	Last Name	Joined	Years	Suburb	Type	Annual Fee
9	1	Roger	Wilson	12/01/1998	17.9	Brighton	Gold	1,125.50
10	2	Mary	Driscoll	23/02/1998	17.7	South Melbourne	Theatre	850.00
11	3	Kate	Fu	2/02/1998	17.8	Bentleigh	Silver	750.00

6

	A	B	C	D	E	F	G	H
1					Criteria		Database Functions	
2								
3					Type		Total	44,588.00
4								
5								
6					Membership Renewals			
7								
8	No	First Name	Last Name	Joined	Years	Suburb	Type	Annual Fee
9	1	Roger	Wilson	12/01/1998	17.9	Brighton	Gold	1,125.50
10	2	Mary	Driscoll	23/02/1998	17.7	South Melbourne	Theatre	850.00
11	3	Kate	Fu	2/02/1998	17.8	Bentleigh	Silver	750.00

7

For Your Reference...

DSUM(database,field,criteria)

This function adds all of the numeric cells in a **field** (column) in a **database** (list) that match the **criteria** (conditions) that you specify.

Database is the cell range for the list, **field** is the cell reference of the column heading, and **criteria** is the criteria range.

Handy to Know...

- You can use multiple criteria in the **DSUM** function by entering them in the column adjacent to the existing criteria and expanding the range for **criteria** in the formula.

USING THE DMIN FUNCTION

The **DMIN** function is used to find the minimum or lowest value in cells in a specified field of a database, where the record matches the criteria specified. The criteria can be specified against

one or more columns and not necessarily against the column that is being examined. The records are not filtered, rather a single minimum figure is returned.

Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file *Advanced Filters_6.xlsx*...

- 1 Click in cell **E4**, type **Gold**, then press

This is our criteria for the function...

- 2 Click in cell **G4**, type **Min**, then press

- 3 Click in cell **H4**, type **=DMIN(A8:H72,E8,E3:E4)** then press

The current minimum number of years for a Gold membership is shown – if necessary, you could format the number in the cell at this point...

- 4 Click in cell **E4**, type **Silver**, then press

The Total and Minimum values will recalculate...

- 5 Repeat step 4 with the values: **Junior Theatre** no criteria (i.e. leave blank)

No criteria will give you the current overall Minimum Years

	A	B	C	D	E	F	G	H	
1					Criteria		Database Functions		
2									
3					Type		Total	18,008.00	
4					Gold		Min	6.8	
5									
6	Membership Renewals								
7									
8	No	First Name	Last Name	Joined	Years	Suburb	Type	Annual Fee	
9	1	Roger	Wilson	12/01/1998	17.9	Brighton	Gold	1,125.50	
10	2	Mary	Driscoll	23/02/1998	17.7	South Melbourne	Theatre	850.00	
11	3	Kate	Fu	2/02/1998	17.8	Bentleigh	Silver	750.00	

3

	A	B	C	D	E	F	G	H	
1					Criteria		Database Functions		
2									
3					Type		Total	11,250.00	
4					Silver		Min	7.1	
5									
6	Membership Renewals								
7									
8	No	First Name	Last Name	Joined	Years	Suburb	Type	Annual Fee	
9	1	Roger	Wilson	12/01/1998	17.9	Brighton	Gold	1,125.50	
10	2	Mary	Driscoll	23/02/1998	17.7	South Melbourne	Theatre	850.00	
11	3	Kate	Fu	2/02/1998	17.8	Bentleigh	Silver	750.00	

4

	A	B	C	D	E	F	G	H	
1					Criteria		Database Functions		
2									
3					Type		Total	44,588.00	
4							Min	6.8	
5									
6	Membership Renewals								
7									
8	No	First Name	Last Name	Joined	Years	Suburb	Type	Annual Fee	
9	1	Roger	Wilson	12/01/1998	17.9	Brighton	Gold	1,125.50	
10	2	Mary	Driscoll	23/02/1998	17.7	South Melbourne	Theatre	850.00	
11	3	Kate	Fu	2/02/1998	17.8	Bentleigh	Silver	750.00	

5

For Your Reference...

DMIN(database,field,criteria)

This function finds the lowest value in the cells in a **field** (column) in a **database** (list) that matches the **criteria** (conditions) that you specify. **Database** is the cell range for the list, **field** is the cell reference of the column heading and **criteria** is the criteria.

Handy to Know...

- When using database functions (e.g. **DMIN**), instead of using a cell address to refer to the field in the database (e.g. **E8**), you can use the database heading text in the cell. For example: **=DMIN(A8:H72,"Years",E3:E4)**, where "Years" refers to the heading in cell E8.

USING THE DMAX FUNCTION

The **DMAX** function is used to find the maximum or highest value in cells in a specified field of a database, where the record matches the criteria specified. The criteria can be specified against

one or more columns and not necessarily against the column that is being examined. The records are not filtered, rather a single maximum figure is calculated.

Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file *Advanced Filters_7.xlsx...*

1 Click in cell **E4**, then type **Gold**

2 Click in cell **G5**, then type **Max**

3 Click in cell **H5**, type **=DMAX(A8:H72,E8,E3:E4)** then press **Enter**

The current maximum number of years for a Gold membership is shown. Let's add formatting...

4 Click in cell **E9**, click on the **Home** tab, click on **Format Painter** in the **Clipboard** group, then click in cell **H5** to apply the formatting

5 Click in cell **E4**, type **Life**, then press **Enter**

The Maximum value will recalculate...

6 Repeat step 5 with the values: **Junior Theatre** no criteria (i.e. leave blank)

No criteria will give you the current overall Maximum Years

	A	B	C	D	E	F	G	H
1					Criteria		Database Functions	
2								
3					Type		Total	18,008.00
4					Gold		Max	6.8
5								17.8525263
6					Membership Renewals			
7								
8	No	First Name	Last Name	Joined	Years	Suburb	Type	Annual Fee
9	1	Roger	Wilson	12/01/1998	17.9	Brighton	Gold	1,125.50
10	2	Mary	Driscoll	23/02/1998	17.7	South Melbourne	Theatre	850.00
11	3	Kate	Fu	2/02/1998	17.8	Bentleigh	Silver	750.00

3

	A	B	C	D	E	F	G	H
1					Criteria		Database Functions	
2								
3					Type		Total	18,008.00
4					Gold		Max	6.8
5								17.9
6					Membership Renewals			
7								
8	No	First Name	Last Name	Joined	Years	Suburb	Type	Annual Fee
9	1	Roger	Wilson	12/01/1998	17.9	Brighton	Gold	1,125.50
10	2	Mary	Driscoll	23/02/1998	17.7	South Melbourne	Theatre	850.00
11	3	Kate	Fu	2/02/1998	17.8	Bentleigh	Silver	750.00

5

	A	B	C	D	E	F	G	H
1					Criteria		Database Functions	
2								
3					Type		Total	220.00
4					Life		Max	8.2
5								17.7
6					Membership Renewals			
7								
8	No	First Name	Last Name	Joined	Years	Suburb	Type	Annual Fee
9	1	Roger	Wilson	12/01/1998	17.9	Brighton	Gold	1,125.50
10	2	Mary	Driscoll	23/02/1998	17.7	South Melbourne	Theatre	850.00
11	3	Kate	Fu	2/02/1998	17.8	Bentleigh	Silver	750.00

6

For Your Reference...

DMAX(database,field,criteria)

This function finds the highest value in the cells in a **field** (column) in a **database** (list) that match the **criteria** (conditions) that you specify. **Database** is the cell range for the list, **field** is the cell reference of the column heading and **criteria** is the criteria range.

Handy to Know...

- When working with databases and database functions, you can place the criteria cells anywhere on the worksheet, but we recommend that you don't type them below the database, as they may be inadvertently overwritten when new records are added.

USING THE DCOUNT FUNCTION

The **DCOUNT** function is used to count the number of values in a specified field of a database, where the record matches the criteria specified. The criteria can be specified against

one or more cells, and not necessarily against the column that is being counted. Any text entries or blank cells are ignored.

Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file *Advanced Filters_8.xlsx...*

- 1 Click in cell **E4** and type **Gold**
- 2 Click in cell **G6** and type **Count**
- 3 Click in cell **H6** and type **=DCOUNT(A8:H72,E8,E3:E4)** then press

The total number of Gold memberships is shown...

- 4 Click in cell **E4** and type **Silver**, then press

The values will recalculate...

- 5 Repeat step 4 for the values: **Junior Theatre** no criteria (i.e. leave blank)

No criteria will give you the total number of records with values in the **Years** column – 64

	A	B	C	D	E	F	G	H
1					Criteria		Database Functions	
2								
3					Type		Total	18,008.00
4					Gold		Max	6.8
5								17.9
6					Membership Renewals		Count	16
7								
8	No	First Name	Last Name	Joined	Years	Suburb	Type	Annual Fee
9	1	Roger	Wilson	12/01/1998	17.9	Brighton	Gold	1,125.50
10	2	Mary	Driscoll	23/02/1998	17.7	South Melbourne	Theatre	850.00
11	3	Kate	Fu	2/02/1998	17.8	Bentleigh	Silver	750.00

3

	A	B	C	D	E	F	G	H
1					Criteria		Database Functions	
2								
3					Type		Total	11,250.00
4					Silver		Max	7.1
5								17.8
6					Membership Renewals		Count	15
7								
8	No	First Name	Last Name	Joined	Years	Suburb	Type	Annual Fee
9	1	Roger	Wilson	12/01/1998	17.9	Brighton	Gold	1,125.50
10	2	Mary	Driscoll	23/02/1998	17.7	South Melbourne	Theatre	850.00
11	3	Kate	Fu	2/02/1998	17.8	Bentleigh	Silver	750.00

4

	A	B	C	D	E	F	G	H
1					Criteria		Database Functions	
2								
3					Type		Total	44,588.00
4							Max	6.8
5								17.9
6					Membership Renewals		Count	64
7								
8	No	First Name	Last Name	Joined	Years	Suburb	Type	Annual Fee
9	1	Roger	Wilson	12/01/1998	17.9	Brighton	Gold	1,125.50
10	2	Mary	Driscoll	23/02/1998	17.7	South Melbourne	Theatre	850.00
11	3	Kate	Fu	2/02/1998	17.8	Bentleigh	Silver	750.00

5

For Your Reference...

DCOUNT(database,field,criteria)

This function counts all of the numeric cells in a **field** (column) in a **database** (list) that match the **criteria** (conditions) that you specify.

Database is the cell range for the list, **field** is the cell reference of the column heading and **criteria** is the criteria range.

Handy to Know...

- When using database functions, you can create OR criteria by including another row below the existing criteria. For instance, if you enter **Gold** in cell **E4** and **Silver** in cell **E5**, then enter **E3:E5** for **criteria** (where E3 is the heading), the function will include records matching either **Gold OR Silver**.

NOTES:



Formatting allows you to change the way that the data in cells within a worksheet appears on the screen. For example, numbers can be made to appear as currency values or percentages by **formatting** them accordingly.

Excel provides a variation on formatting known as **conditional formatting**. With conditional formatting, cells can be formatted in different colour schemes. Rather than this formatting being applied to all cells in a range, it is applied selectively and based on specific rules. This type of formatting allows you to see, for example, values that are over a certain amount, or to instantly spot high and low values based on assigned colouring.

In this session you will:

- ✓ gain an understanding of conditional formatting
- ✓ learn how to conditionally format cells containing specific values
- ✓ learn how to clear conditional formatting
- ✓ learn how to use more of the cell formatting options
- ✓ learn how to format the top ten items in a range
- ✓ learn how to use the various **Top/Bottom Rules**
- ✓ learn how to work with data bars
- ✓ learn how to work with colour scales when formatting conditionally
- ✓ learn how to apply icon sets to conditionally format a range
- ✓ gain an understanding of sparklines
- ✓ learn how to create sparklines
- ✓ learn how to edit sparklines
- ✓ learn how to use logical formulas for more complex conditional formatting
- ✓ gain an understanding of the **Conditional Formatting Rules Manager**
- ✓ learn how to manage rules.

UNDERSTANDING CONDITIONAL FORMATTING

As the name suggests, **conditional formatting** is a type of formatting that is applied to cells or ranges when certain conditions are met. These conditions are set, but can quite often be

customised and edited, in **rules** that have been programmed into Excel. There are two types of conditional formatting – **values-based** formatting and **trend-based** formatting.

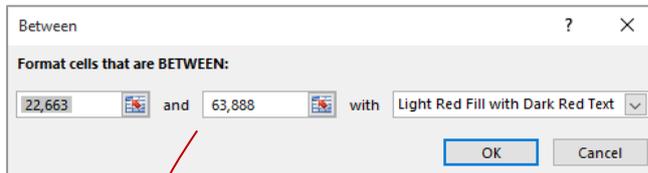
What Happens With Conditional Formatting

With **conditional formatting**, cells in a specified range are coloured or shaded according to certain conditions which are outlined in **rules**.

Values-Based Conditional Formatting

With **values-based** conditional formatting, cells in the range are examined and their shading and colouring is based on whether they meet the conditions of the rule. This type of formatting allows you to see whether values in a range are **greater than** a certain value, **less than** a certain value, **equal** to a certain value, or fall **between** ranges. You can also display the **top ten**, **bottom ten**, **top 10%**, **bottom 10%**, and **above** and **below averages** with this type of formatting.

In all cases a dialog box will appear which allows you to modify the rule based on what is required. Basically, the dialog box allows you to specify a value or a range of values for the rule, and to determine the colour of the shading used. Below is an example of the dialog box for applying the **Between** rule.



	A	B	C	D	E	F	G	H	I
1	Quarterly Used Vehicle Sales								
2									
3	Make	Model	Jan	Feb	Mar	Apr	May	Jun	Total
4	BMW	3 Series	15,900	5,740	26,850	28,455	3,200	7,223	87,368
5		5 Series	24,300	15,200	6,590	5,940	7,900	43,211	103,141
6		7 Series	4,500	3,420	32,700	2,540	4,300	2,050	49,510
7		X3	9,766	3,400	4,556	15,200	6,590	47,100	86,612
8		X5	84,500	15,400	70,300	3,420	32,700	2,300	208,620
9		Z3	11,000	6,539	8,900	2,050	5,940	4,300	38,729
10		Z4	12,400	4,500	5,900	47,100	2,540	5,600	78,040
11	Ford	Ecstasy	7,223	4,200	8,332	23,441	4,778	4,220	52,194

Trend-Based Conditional Formatting

With **trend-based** conditional formatting, colouring is applied to all of the cells in the range. The depth of the colouring is determined by the values shown in each cell relative to the overall total of the range. This allows you to instantly spot higher, lower and median values in the range and to see the trend of the numbers. The formatting can be applied in the form of **coloured bars**, **coloured scales** and even **icons**.

	A	B	C	D	E	F	G	H	I
1	Quarterly Used Vehicle Sales								
2									
3	Make	Model	Jan	Feb	Mar	Apr	May	Jun	Total
4	BMW	3 Series	15,900	5,740	26,850	28,455	3,200	7,223	87,368
5		5 Series	24,300	15,200	6,590	5,940	7,900	43,211	103,141
6		7 Series	4,500	3,420	32,700	2,540	4,300	2,050	49,510
7		X3	9,766	3,400	4,556	15,200	6,590	47,100	86,612
8		X5	84,500	15,400	70,300	3,420	32,700	2,300	208,620
9		Z3	11,000	6,539	8,900	2,050	5,940	4,300	38,729
10		Z4	12,400	4,500	5,900	47,100	2,540	5,600	78,040
11	Total		162,366	54,199	155,796	104,705	63,170	111,784	652,020
12									

Coloured scales

Icons

Coloured bars

FORMATTING CELLS CONTAINING VALUES

A common analysis requirement is to see what values in a worksheet are greater than a specific amount. For example, you may want to see which salespeople have achieved better than

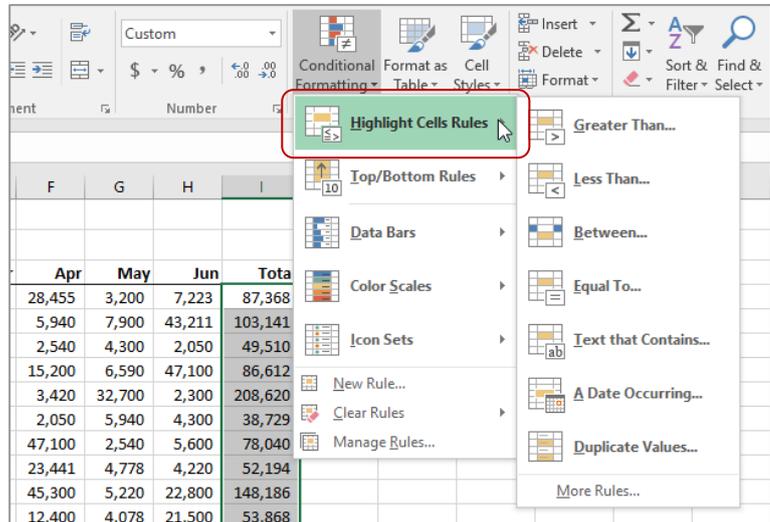
their set targets. This can be done using the **Greater Than** option which appears under **Highlight Cell Rules** in the **Conditional Formatting** menu on the **Home** tab.

Try This Yourself:

Open File

Before starting this exercise you **MUST** open the file *Conditional Formatting_1.xlsx...*

- 1 Select the range **I4:I45**
- 2 Click on the **Home** tab, click on **Conditional Formatting** in the **Styles** group, then point to **Highlight Cells Rules** to display a menu of options, as shown
- 3 Select **Greater Than** to display the **Greater Than** dialog box
With Live Preview, the cells in the range that meet the condition are highlighted...
- 4 In **Format cells that are GREATER THAN:** type **90000**
Notice how the formatting changes...
- 5 Click on the drop arrow for **with**, then select **Green Fill with Dark Green Text** to change the colour of the shading
- 6 Click on **[OK]** to apply the formatting
- 7 Click in a blank cell to deselect the range and see the formatting more clearly



2

3



7

	A	B	C	D	E	F	G	H	I
1	Quarterly Used Vehicle Sales								
2									
3	Make	Model	Jan	Feb	Mar	Apr	May	Jun	Total
4	BMW	3 Series	15,900	5,740	26,850	28,455	3,200	7,223	87,368
5		5 Series	24,300	15,200	6,590	5,940	7,900	43,211	103,141
6		7 Series	4,500	3,420	32,700	2,540	4,300	2,050	49,510
7		X3	9,766	3,400	4,556	15,200	6,590	47,100	86,612
8		X5	84,500	15,400	70,300	3,420	32,700	2,300	208,620
9		Z3	11,000	6,539	8,900	2,050	5,940	4,300	38,729
10		Z4	12,400	4,500	5,900	47,100	2,540	5,600	78,040
11	Ford	Ecstasy	7,223	4,200	8,332	23,441	4,778	4,220	52,194
12		Explorer	43,211	28,455	3,200	45,300	5,220	22,800	148,186
13		Fiesta	2,050	5,940	7,900	12,400	4,078	21,500	53,868

For Your Reference...

To **format cells containing specific values**:

1. Select the range
2. Click on the **Home** tab, then click on **Conditional Formatting** in the **Styles** group
3. Point to **Highlight Cell Rules**, then select **Greater Than**
4. Set the options as required and click on **[OK]**

Handy to Know...

- The **Greater Than** conditional formatting option is very literal. If, for example, you ask it to format values over 90,000 it will only format values that are over 90,000 – any value of 90,000 will not be formatted.

CLEARING CONDITIONAL FORMATTING

Excel will compound conditional formats. For example, you can apply a **Greater Than** format, then come back and apply a **Less Than** format. The original format will remain, depending upon

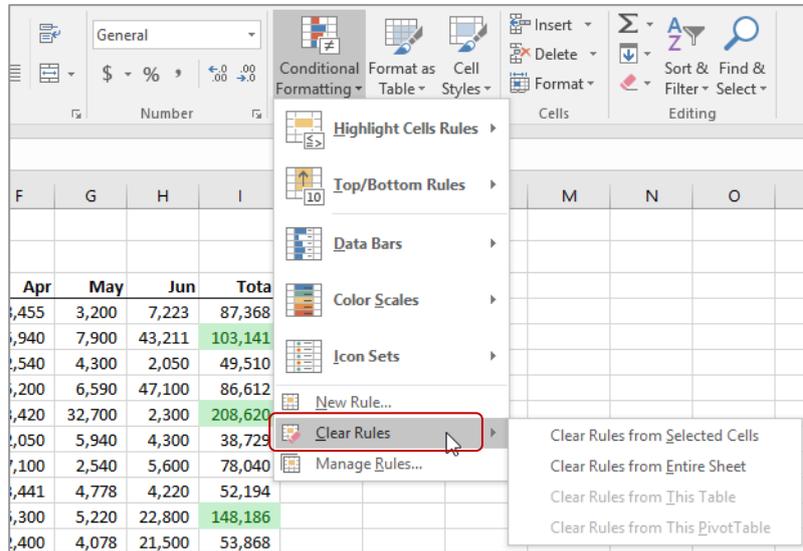
what is required in the second format. Unless you want compounding formats, you should **clear** any previous formats from the worksheet before applying a new one.

Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file *Conditional Formatting_2.xlsx...*

- 1 Click on the **Home** tab, then click on **Conditional Formatting** in the **Styles** group to display a menu of options
- 2 Point to **Clear Rules** to display a menu of options
- 3 Select **Clear Rules from Entire Sheet** to clear all the formatting from the entire worksheet



2

	A	B	C	D	E	F	G	H	I
1	Quarterly Used Vehicle Sales								
2									
3	Make	Model	Jan	Feb	Mar	Apr	May	Jun	Total
4	BMW	3 Series	15,900	5,740	26,850	28,455	3,200	7,223	87,368
5		5 Series	24,300	15,200	6,590	5,940	7,900	43,211	103,141
6		7 Series	4,500	3,420	32,700	2,540	4,300	2,050	49,510
7		X3	9,766	3,400	4,556	15,200	6,590	47,100	86,612
8		X5	84,500	15,400	70,300	3,420	32,700	2,300	208,620
9		Z3	11,000	6,539	8,900	2,050	5,940	4,300	38,729
10		Z4	12,400	4,500	5,900	47,100	2,540	5,600	78,040
11	Ford	Ecstasy	7,223	4,200	8,332	23,441	4,778	4,220	52,194
12		Explorer	43,211	28,455	3,200	45,300	5,220	22,800	148,186

3

For Your Reference...

To **clear conditional formatting**:

1. Click on the **Home** tab, then click on **Conditional Formatting** in the **Styles** group
2. Point to **Clear Rules**, then select an option

Handy to Know...

- You can clear the conditional formatting from a selected range by clicking on the **Home** tab, then in the **Styles** group, selecting **Conditional Formatting > Clear Rules > Clear Rules from Selected Cells**. This is useful if you have conditional formatting within the worksheet that you wish to retain.

MORE CELL FORMATTING OPTIONS

There are a number of options under **Highlight Cells Rules** on the **Conditional Formatting** menu that are handy to know about and use. These include the ability to format **less than a**

value, format for values **between** two values, and format for values **equal** to a specific value.

Try This Yourself:

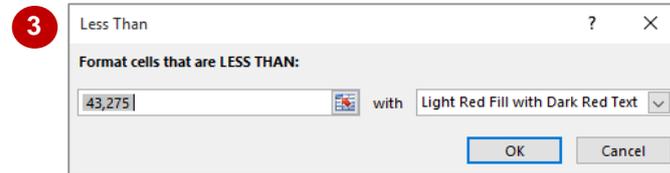
Same File

Continue using the previous file with this exercise, or open the file *Conditional Formatting_3.xlsx...*

- 1 Select the range **C4:H10**
This includes all of the sales for BMW motor vehicles...
- 2 Click on the **Home** tab, click on **Conditional Formatting** in the **Styles** group, then point to **Highlight Cells Rules** to display a menu of options
- 3 Select **Less Than** to display the **Less Than** dialog box
- 4 Type **15000** to see how many months had model sales less than **15,000**
At this stage we want to use more of these commands so we'll cancel the previous one...
- 5 Click on **[Cancel]** to cancel the formatting
- 6 Repeat steps 2 to 5 to see the formatting for the **Between** setting and the **Equal To** setting
- 7 Click on **[Cancel]** to cancel the formatting

	A	B	C	D	E	F	G	H	I
1	Quarterly Used Vehicle Sales								
2									
3	Make	Model	Jan	Feb	Mar	Apr	May	Jun	Total
4	BMW	3 Series	15,900	5,740	26,850	28,455	3,200	7,223	87,368
5		5 Series	24,300	15,200	6,590	5,940	7,900	43,211	103,141
6		7 Series	4,500	3,420	32,700	2,540	4,300	2,050	49,510
7		X3	9,766	3,400	4,556	15,200	6,590	47,100	86,612
8		X5	84,500	15,400	70,300	3,420	32,700	2,300	208,620
9		Z3	11,000	6,539	8,900	2,050	5,940	4,300	38,729
10		Z4	12,400	4,500	5,900	47,100	2,540	5,600	78,040
11	Ford	Ecstasy	7,223	4,200	8,332	23,441	4,778	4,220	52,194

1



	A	B	C	D	E	F	G	H	I
1	Quarterly Used Vehicle Sales								
2									
3	Make	Model	Jan	Feb	Mar	Apr	May	Jun	Total
4	BMW	3 Series	15,900	5,740	26,850	28,455	3,200	7,223	87,368
5		5 Series	24,300	15,200	6,590	5,940	7,900	43,211	103,141
6		7 Series	4,500	3,420	32,700	2,540	4,300	2,050	49,510
7		X3	9,766	3,400	4,556	15,200	6,590	47,100	86,612
8		X5	84,500	15,400	70,300	3,420	32,700	2,300	208,620
9		Z3	11,000	6,539	8,900	2,050	5,940	4,300	38,729
10		Z4	12,400	4,500	5,900	47,100	2,540	5,600	78,040
11	Ford								52,194
12									148,186
13									53,868
14									152,140
15									51,644
16									72,063
17	GMH								119,276
18		Traveller	35,400	18,900	21,500	5,940	3,200	2,050	86,990

4

For Your Reference...

To **format cells containing specific values**:

1. Select the range, then click on the **Home** tab
2. Click on **Conditional Formatting** in the **Styles** group
3. Point to **Highlight Cells Rules**, select an option, apply the settings as necessary, then click on **[OK]**

Handy to Know...

- When applying conditional formatting, if you inadvertently click on **[OK]** instead of **[Cancel]**, you can either use the **Clear Rules** option or the **Undo** tool in the **Quick Access Toolbar** to remove the unwanted formatting.

TOP TEN ITEMS

Conditional formatting can be used in a worksheet to highlight upper and lower values. For example, it is often interesting to know your top 10 customers, or the top 10% of products

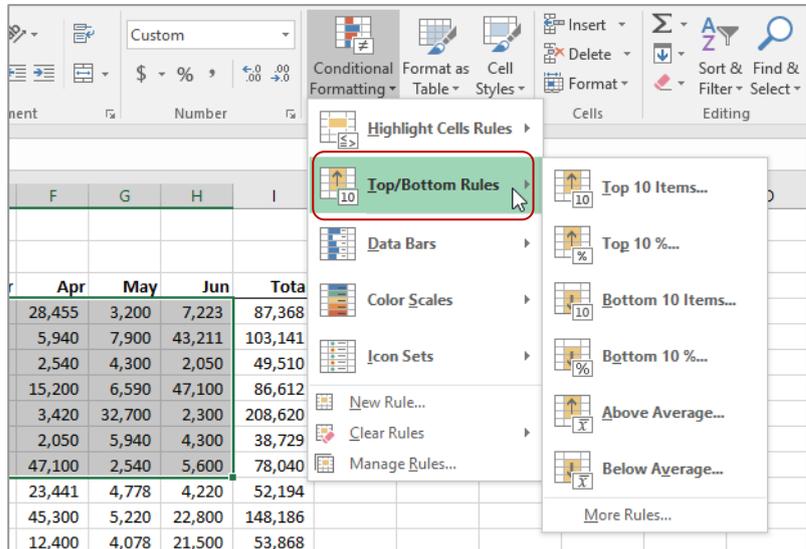
sold in the last year. This can be achieved using the **Top/Bottom Rules** menu which can be accessed from the **Conditional Formatting** menu.

Try This Yourself:

Same File

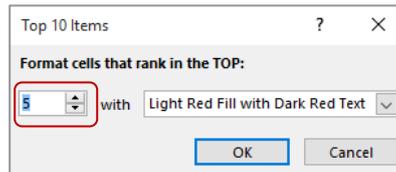
Continue using the previous file with this exercise, or open the file *Conditional Formatting_4.xlsx...*

- 1 Select the range **C4:H10**
- 2 Click on the **Home** tab, click on **Conditional Formatting** in the **Styles** group, then point to **Top/Bottom Rules** to see the available options
- 3 Select **Top 10 Items** to display the **Top 10 Items** dialog box – shading will now be applied to the top 10 items in the range
- 4 Click on the down spinner arrow next to the quantity until **5** appears, as shown
The top 5 items in the range will now be coloured...
- 5 Click on **[OK]** to apply the formatting
- 6 Click outside the range to deselect it and see the results more clearly
- 7 Click on **Conditional Formatting** in the **Styles** group, then select **Clear Rules from Entire Sheet** to clear the formatting



2

4



	A	B	C	D	E	F	G	H	I
1	Quarterly Used Vehicle Sales								
2									
3	Make	Model	Jan	Feb	Mar	Apr	May	Jun	Total
4	BMW	3 Series	15,900	5,740	26,850	28,455	3,200	7,223	87,368
5		5 Series	24,300	15,200	6,590	5,940	7,900	43,211	103,141
6		7 Series	4,500	3,420	32,700	2,540	4,300	2,050	49,510
7		X3	9,766	3,400	4,556	15,200	6,590	47,100	86,612
8		X5	84,500	15,400	70,300	3,420	32,700	2,300	208,620
9		Z3	11,000	6,539	8,900	2,050	5,940	4,300	38,729
10		Z4	12,400	4,500	5,900	47,100	2,540	5,600	78,040
11	Ford	Ecstasy	7,223	4,200	8,332	23,441	4,778	4,220	52,194

6

For Your Reference...

To **format** the **top ten items**:

1. Select the range
2. Click on the **Home** tab, click on **Conditional Formatting** in the **Styles** group, then point to **Top/Bottom Rules**
3. Select an option

Handy to Know...

- Don't confuse the **Top 10 Items** with the **Top 10%** – the former displays only 10 results while the latter can display a variable amount of results based on what fits into the top ten percent category.

MORE TOP AND BOTTOM FORMATTING OPTIONS

The **Top/Bottom Rules** option in the **Conditional Formatting** menu provides a number of useful options for displaying upper and lower ranges in your data. You can display the

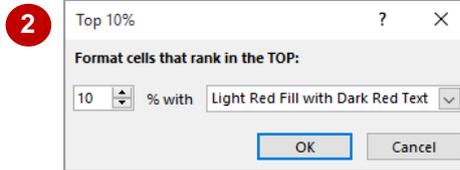
top and bottom <n> number of values, the top and bottom percentage, and whether values are above or below average.

Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file *Conditional Formatting_5.xlsx...*

- 1 Select the range **C4:H10**
This includes all of the sales for BMW motor vehicles...
- 2 Click on the **Home** tab, click on **Conditional Formatting** in the **Styles** group, point to **Top/Bottom Rules**, then select **Top 10%** to display the **Top 10%** dialog box
- 3 Spend a few moments studying the results
- 4 Click on **[Cancel]** to clear any formatting
- 5 Repeat steps 2, 3 and 4 to select the **Bottom 10 Items**, **Bottom 10%**, **Above Average**, and **Below Average** options to view the results



	A	B	C	D	E	F	G	H	I
1	Quarterly Used Vehicle Sales								
2									
3	Make	Model	Jan	Feb	Mar	Apr	May	Jun	Total
4	BMW	3 Series	15,900	5,740	26,850	28,455	3,200	7,223	87,368
5		5 Series	24,300	15,200	6,590	5,940	7,900	43,211	103,141
6		7 Series	4,500	3,420	32,700	2,540	4,300	2,050	49,510
7		X3	9,766	3,400	4,556	15,200	6,590	47,100	86,612
8		X5	84,500	15,400	70,300	3,420	32,700	2,300	208,620
9		Z3	11,000	6,539	8,900	2,050	5,940	4,300	38,729
10		Z4	12,400	4,500	5,900	47,100	2,540	5,600	78,040
11	Ford	Ecstasy	7,223	4,200	8,222	22,441	4,778	4,220	52,194
12		Explorer							148,186
13		Fiesta							53,868
14		Mercury							152,140
15		Mustang							25 51,644
16		Raven							23 72,063
17	GMH	Adventurer							11 119,276
18		Traveller	35,400	18,900	21,500	5,940	3,200	2,050	86,990

	A	B	C	D	E	F	G	H	I
1	Quarterly Used Vehicle Sales								
2									
3	Make	Model	Jan	Feb	Mar	Apr	May	Jun	Total
4	BMW	3 Series	15,900	5,740	26,850	28,455	3,200	7,223	87,368
5		5 Series	24,300	15,200	6,590	5,940	7,900	43,211	103,141
6		7 Series	4,500	3,420	32,700	2,540	4,300	2,050	49,510
7		X3	9,766	3,400	4,556	15,200	6,590	47,100	86,612
8		X5	84,500	15,400	70,300	3,420	32,700	2,300	208,620
9		Z3	11,000	6,539	8,900	2,050	5,940	4,300	38,729
10		Z4	12,400	4,500	5,900	47,100	2,540	5,600	78,040
11	Ford	Ecstasy	7,223	4,200	8,222	22,441	4,778	4,220	52,194
12		Explorer							148,186
13		Fiesta							53,868
14		Mercury							152,140
15		Mustang							25 51,644
16		Raven							23 72,063
17	GMH	Adventurer							11 119,276
18		Traveller	35,400	18,900	21,500	5,940	3,200	2,050	86,990

For Your Reference...

To **format cells** for **top** or **bottom**:

1. Select the range
2. Click on the **Home** tab, click on **Conditional Formatting** and point to **Top/Bottom Rules**
3. Select an option, apply the desired settings and click on **[OK]**

Handy to Know...

- The up and down spinner arrows next to the values in the **conditional formatting** dialog boxes allow you to refine your conditional formatting for the number of items and the percentage of items.

WORKING WITH DATA BARS

It is sometimes difficult to spot patterns or trends when confronted with a worksheet full of figures. Conditional formatting allows you to colour cells so that you can see how the figures move from

high value to low value. **Data bars** provide colour accents to cells in the selected range. The width of the accents depends on the data value and its size relative to the overall total value.

Try This Yourself:

Open File

Before starting this exercise you **MUST** open the file *Conditional Formatting_6.xlsx...*

- 1 Select the range **C11:H11**

This range represents the total monthly sales of BMW vehicles...

- 2 Click on the **Home** tab, click on **Conditional Formatting** in the **Styles** group, then point to **Data Bars** to see the available options

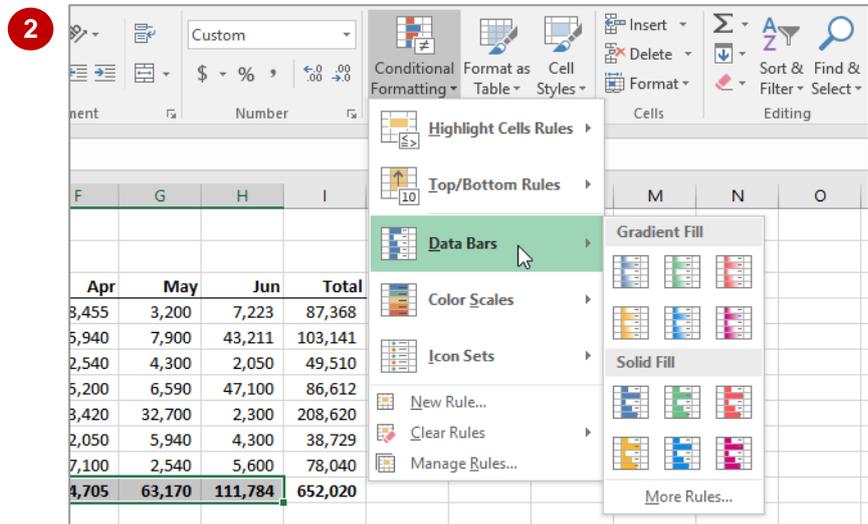
- 3 Point to the options to see a Live Preview of the result

- 4 Click on **Orange Data Bar** under **Gradient Fill**, then click outside the range to deselect it

The bars indicate the size of each value relative to the total

- 1

	A	B	C	D	E	F	G	H	I
1	Quarterly Used Vehicle Sales								
2									
3	Make	Model	Jan	Feb	Mar	Apr	May	Jun	Total
4	BMW	3 Series	15,900	5,740	26,850	28,455	3,200	7,223	87,368
5		5 Series	24,300	15,200	6,590	5,940	7,900	43,211	103,141
6		7 Series	4,500	3,420	32,700	2,540	4,300	2,050	49,510
7		X3	9,766	3,400	4,556	15,200	6,590	47,100	86,612
8		X5	84,500	15,400	70,300	3,420	32,700	2,300	208,620
9		Z3	11,000	6,539	8,900	2,050	5,940	4,300	38,729
10		Z4	12,400	4,500	5,900	47,100	2,540	5,600	78,040
11	Total		162,366	54,199	155,796	104,705	63,170	111,784	652,020
12									



- 4

	A	B	C	D	E	F	G	H	I
1	Quarterly Used Vehicle Sales								
2									
3	Make	Model	Jan	Feb	Mar	Apr	May	Jun	Total
4	BMW	3 Series	15,900	5,740	26,850	28,455	3,200	7,223	87,368
5		5 Series	24,300	15,200	6,590	5,940	7,900	43,211	103,141
6		7 Series	4,500	3,420	32,700	2,540	4,300	2,050	49,510
7		X3	9,766	3,400	4,556	15,200	6,590	47,100	86,612
8		X5	84,500	15,400	70,300	3,420	32,700	2,300	208,620
9		Z3	11,000	6,539	8,900	2,050	5,940	4,300	38,729
10		Z4	12,400	4,500	5,900	47,100	2,540	5,600	78,040
11	Total		162,366	54,199	155,796	104,705	63,170	111,784	652,020
12									

For Your Reference...

To use **data bars** to **highlight values**:

1. Select the range
2. Click on the **Home** tab, then click on **Conditional Formatting** in the **Styles** group
3. Point to **Data Bars** and select an option

Handy to Know...

- To change to a different **Data Bar** colour, select the required range, click on the **Home** tab, then click on **Conditional Formatting** in the **Styles** group, point to **Data Bars** and click on an option to apply it.

WORKING WITH COLOUR SCALES

Using **colour scales**, you can highlight the values of cells in a selected range relative to the total value of all cells in that range. After selecting a colour scale, each cell in the range is shaded

with a different hue and intensity of one of the colours in the scale, dependent upon its value relative to the overall selection total.

Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file *Conditional Formatting_7.xlsx...*

- 1 Select the range **C4:H4**
This is the vehicle monthly sales for the 3 Series BMW vehicles...
- 2 Click on the **Home** tab, click on **Conditional Formatting**, then point to **Colour Scales** to see the options available
- 3 Point to the colours to see a Live Preview of the result how coloured shading appears across the selected range
- 4 Select **Green-Yellow-Red Colour Scale**
- 5 Select the range **C7:H8**
This is the vehicle monthly sales for the X Series BMW...
- 6 Repeat steps 2 and 4 to apply **Green-Yellow-Red Colour Scale** shading
- 7 Click outside the range to deselect it and see the results

1

	A	B	C	D	E	F	G	H	I
1	Quarterly Used Vehicle Sales								
2									
3	Make	Model	Jan	Feb	Mar	Apr	May	Jun	Total
4	BMW	3 Series	15,900	5,740	26,850	28,455	3,200	7,223	87,368
5		5 Series	24,300	15,200	6,590	5,940	7,900	43,211	103,141
6		7 Series	4,500	3,420	32,700	2,540	4,300	2,050	49,510
7		X3	9,766	3,400	4,556	15,200	6,590	47,100	86,612
8		X5	84,500	15,400	70,300	3,420	32,700	2,300	208,620
9		Z3	11,000	6,539	8,900	2,050	5,940	4,300	38,729
10		Z4	12,400	4,500	5,900	47,100	2,540	5,600	78,040
11	Total		162,366	54,199	155,796	104,705	63,170	111,784	652,020
12									

4

	A	B	C	D	E	F	G	H	I
1	Quarterly Used Vehicle Sales								
2									
3	Make	Model	Jan	Feb	Mar	Apr	May	Jun	Total
4	BMW	3 Series	15,900	5,740	26,850	28,455	3,200	7,223	87,368
5		5 Series	24,300	15,200	6,590	5,940	7,900	43,211	103,141
6		7 Series	4,500	3,420	32,700	2,540	4,300	2,050	49,510
7		X3	9,766	3,400	4,556	15,200	6,590	47,100	86,612
8		X5	84,500	15,400	70,300	3,420	32,700	2,300	208,620
9		Z3	11,000	6,539	8,900	2,050	5,940	4,300	38,729
10		Z4	12,400	4,500	5,900	47,100	2,540	5,600	78,040
11	Total		162,366	54,199	155,796	104,705	63,170	111,784	652,020
12									

7

	A	B	C	D	E	F	G	H	I
1	Quarterly Used Vehicle Sales								
2									
3	Make	Model	Jan	Feb	Mar	Apr	May	Jun	Total
4	BMW	3 Series	15,900	5,740	26,850	28,455	3,200	7,223	87,368
5		5 Series	24,300	15,200	6,590	5,940	7,900	43,211	103,141
6		7 Series	4,500	3,420	32,700	2,540	4,300	2,050	49,510
7		X3	9,766	3,400	4,556	15,200	6,590	47,100	86,612
8		X5	84,500	15,400	70,300	3,420	32,700	2,300	208,620
9		Z3	11,000	6,539	8,900	2,050	5,940	4,300	38,729
10		Z4	12,400	4,500	5,900	47,100	2,540	5,600	78,040
11	Total		162,366	54,199	155,796	104,705	63,170	111,784	652,020
12									

For Your Reference...

To use **colour scales** to **highlight values**:

1. Select the range
2. Click on the **Home** tab, click on **Conditional Formatting** in the **Styles** group, then point to **Colour Scales**
3. Select an option

Handy to Know...

- With a three colour option, Excel divides the values according to the number of cells in the range and then applies a scale of hues. In the **Green-Yellow-Red Colour Scale** option the first colour (**Green**) is applied to the highest value, while the last colour (**Red**) is applied to the lowest.

WORKING WITH ICON SETS

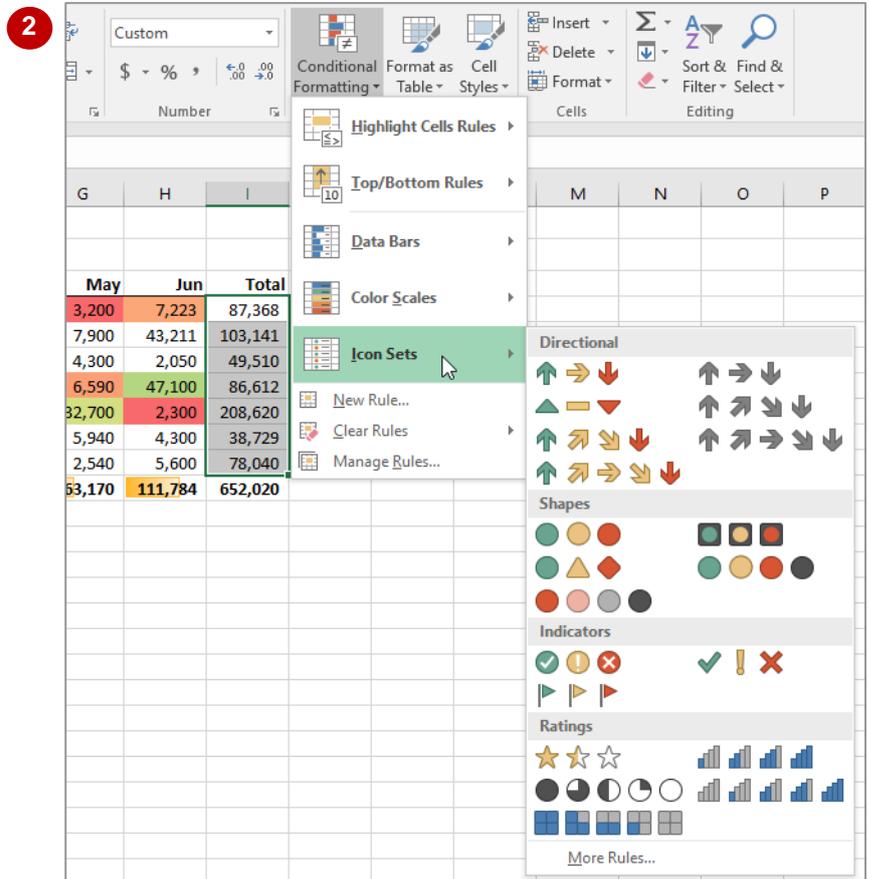
Using colours to conditionally format ranges in a worksheet is fine providing that your readers are capable of interpreting and indeed even seeing colours. In lieu of colouring a conditionally

formatted range, you can apply **icons** to the range. With **icons** a symbol is placed next to a cell to indicate the position of that value relative to the range total.

Try This Yourself:

Same File Continue using the previous file with this exercise, or open the file *Conditional Formatting_8.xlsx...*

- 1 Select the range **I4:I10**
This is the total sales for each BMW model over six months...
- 2 Click on the **Home** tab, click on **Conditional Formatting** in the **Styles** group, then point to **Icon Sets** to see a gallery of options
- 3 Point to the options to see a Live Preview of the result in the spreadsheet
- 4 Under **Indicators**, click on **3 Symbols (Uncircled)** to select this option and apply it to the selected range
The hash (#) symbols next to the icons show the column is too narrow to display the values...
- 5 In the column header area, double-click on the right margin of column **I** to widen it to fit the content
- 6 Click outside the range to view the result



6

	A	B	C	D	E	F	G	H	I
1	Quarterly Used Vehicle Sales								
2									
3	Make	Model	Jan	Feb	Mar	Apr	May	Jun	Total
4	BMW	3 Series	15,900	5,740	26,850	28,455	3,200	7,223	87,368
5		5 Series	24,300	15,200	6,590	5,940	7,900	43,211	103,141
6		7 Series	4,500	3,420	32,700	2,540	4,300	2,050	49,510
7		X3	9,766	3,400	4,556	15,200	6,590	47,100	86,612
8		X5	84,500	15,400	70,300	3,420	32,700	2,300	208,620
9		Z3	11,000	6,539	8,900	2,050	5,940	4,300	38,729
10		Z4	12,400	4,500	5,900	47,100	2,540	5,600	78,040
11	Total		162,366	54,199	155,796	104,705	63,170	111,784	652,020
12									

For Your Reference...

To use **icon sets** to **highlight values**:

1. Select the range
2. On the **Home** tab click on **Conditional Formatting** and point to **Icon Sets**
3. Select an option

Handy to Know...

- Using the **3 Symbols (Uncircled)** conditional formatting option, there are three icons that are applied according to the rule of **thirds** in the range. Values that fall within the top third receive the tick icon, values in the second third receive the exclamation mark, and the values in the last third receive the cross.

UNDERSTANDING SPARKLINES

Sparklines are mini-charts that are inserted into a single cell of a worksheet. You use Sparklines to graphically represent trends and patterns in the data in a specific range of cells in the

worksheet. You insert Sparklines from the **Insert** tab on the ribbon.

What Are Sparklines?

Sparklines are simply mini-charts embedded into a single cell. Before you insert a Sparkline you must select the range of values you want the Sparkline to represent.

	A	B	C	D	E	F	G
1	Quarterly Used Vehicle Sales						
2							
3	Make	Model	Jan	Feb	Mar	Total	
4	BMW	3 Series	15,900	5,740	26,850	48,490	
5		5 Series	24,300	15,200	6,590	46,090	
6		7 Series	4,500	- 2,900	32,700	34,300	
7		X3	9,766	3,400	4,556	17,722	
8		X5	84,500	15,400	70,300	170,200	

Each of the Sparklines above charts the figures for the **Jan**, **Feb** and **Mar** columns in the row to their left. For example, the Sparkline in cell **G4** charts the figures in the range **C4:E4**.

There are three different types of Sparklines available in Excel: **Line**, **Column** and **Win/Loss**, as shown above.

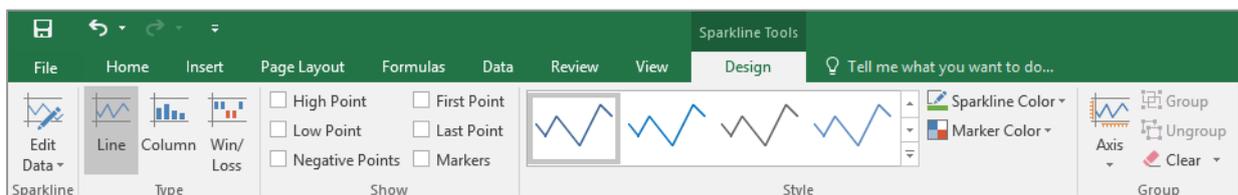
The **Line Sparkline** displays as a line chart. When dots appear in conjunction with the lines it is because the Sparklines have been asked to display the highest and lowest values and the dots represent these values.

A **Column Sparkline** displays as vertical bars. The **Win/Loss Sparkline** displays positive values in one colour above an imaginary line and negative values in another colour below that imaginary line.

While Sparklines are not as versatile as charts, you still have a lot of formatting options at your disposal when working with them. When a cell containing a Sparkline is selected, the **Sparkline Tools: Design** tab will appear in the ribbon as shown below.

The Sparkline Tools: Design tab

The **Sparkline Tools: Design** tab allows you to change the type of Sparkline in a cell, change formatting options such as style and colouring, and show various high points, low points and the like. There is also a command that allows you to clear Sparklines from the cell.



CREATING SPARKLINES

You can choose to create a **Line**, **Column** or **Win/Loss Sparkline**, depending on the type of data you are working with. While it is more efficient to get it right at this stage, you do have

the option of changing the type of Sparkline after it is created. Like other forms of charting you will need to select the data series before creating the Sparkline.

Try This Yourself:

Open File

Before starting this exercise you **MUST** open the file *Conditional Formatting_9.xlsx...*

- 1 Select the range **C4:E4**
- 2 Click on the **Insert** tab, then click on **Column** in the **Sparklines** group to display the **Create Sparklines** dialog box
The dialog box shows the data range but requires a location for the Sparkline...
- 3 Click in cell **G4** in the worksheet, then click on **[OK]** to create the **Sparkline**
- 4 Select the range **C5:E5**
- 5 On the **Insert** tab, click on **Line** in the **Sparklines** group to display the **Create Sparklines** dialog box
- 6 Click in cell **G5** in the worksheet, then click on **[OK]**
- 7 Repeat the above steps to create a **Win/Loss Sparkline** in **G6** for the range **C6:E6**

1

	A	B	C	D	E	F	G
1	Quarterly Used Vehicle Sales						
2							
3	Make	Model	Jan	Feb	Mar	Total	
4	BMW	3 Series	15,900	5,740	26,850	48,490	
5		5 Series	24,300	15,200	6,590	46,090	
6		7 Series	4,500	2,900	32,700	34,300	
7		X3	9,766	3,400	4,556	17,722	

2

3

	A	B	C	D	E	F	G
1	Quarterly Used Vehicle Sales						
2							
3	Make	Model	Jan	Feb	Mar	Total	
4	BMW	3 Series	15,900	5,740	26,850	48,490	
5		5 Series	24,300	15,200	6,590	46,090	
6		7 Series	4,500	2,900	32,700	34,300	
7		X3	9,766	3,400	4,556	17,722	

7

	A	B	C	D	E	F	G
1	Quarterly Used Vehicle Sales						
2							
3	Make	Model	Jan	Feb	Mar	Total	
4	BMW	3 Series	15,900	5,740	26,850	48,490	
5		5 Series	24,300	15,200	6,590	46,090	
6		7 Series	4,500	2,900	32,700	34,300	
7		X3	9,766	3,400	4,556	17,722	

For Your Reference...

To **create** a **Sparkline**:

1. Select the range for the data series
2. Click on the **Insert** tab, then click on a **Sparkline** type in the **Sparklines** group
3. Click in the location cell and click on **[OK]**

Handy to Know...

- You may need to increase the row height of rows which have Sparklines in them in order to see the trends clearly.

EDITING SPARKLINES

Sparklines in Excel are both easy to create and easy to edit. When a cell containing a Sparkline is selected, the **Sparkline Tools: Design** tab will appear on the ribbon. This tab allows you to

change the type of Sparkline in the cell, its formatting and colouring, and to specify things such as high and low points. You can also fill Sparklines to adjacent cells.

Try This Yourself:

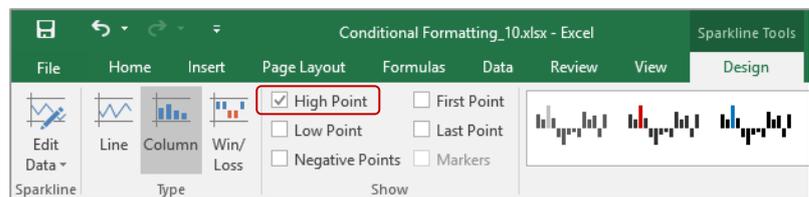
Same File

Continue using the previous file with this exercise, or open the file *Conditional Formatting_10.xlsx...*

- 1 Click in cell **G4**, then click on the **Sparkline Tools: Design** tab
- 2 Click on the **Sparkline Colour** drop arrow in the **Style** group, then click on **Green, Accent 6** to apply this colour to the Sparkline
- 3 In the **Show** group, click on **High Point** so it is ticked
The highest value in the Sparkline will appear in a different colour...
- 4 Repeat step 3 to select **Low Point** to apply different colouring to the lowest point
- 5 In the **Type** group, click on **Line** to change the Sparkline type from a column to a line
- 6 Click in cell **G5**, then click on **Clear** in the **Group** group to remove the Sparkline from this cell
- 7 Click in cell **G6**, then drag the fill handle down to **G10** to create more Sparklines

2

	A	B	C	D	E	F	G
1	Quarterly Used Vehicle Sales						
2							
3	Make	Model	Jan	Feb	Mar	Total	
4	BMW	<i>3 Series</i>	15,900	5,740	26,850	48,490	
5		<i>5 Series</i>	24,300	15,200	6,590	46,090	
6		<i>7 Series</i>	4,500	2,900	32,700	34,300	
7		<i>X3</i>	9,766	3,400	4,556	17,722	



3

5

	A	B	C	D	E	F	G
1	Quarterly Used Vehicle Sales						
2							
3	Make	Model	Jan	Feb	Mar	Total	
4	BMW	<i>3 Series</i>	15,900	5,740	26,850	48,490	
5		<i>5 Series</i>	24,300	15,200	6,590	46,090	
6		<i>7 Series</i>	4,500	2,900	32,700	34,300	
7		<i>X3</i>	9,766	3,400	4,556	17,722	

7

	A	B	C	D	E	F	G
3	Make	Model	Jan	Feb	Mar	Total	
4	BMW	<i>3 Series</i>	15,900	5,740	26,850	48,490	
5		<i>5 Series</i>	24,300	15,200	6,590	46,090	
6		<i>7 Series</i>	4,500	2,900	32,700	34,300	
7		<i>X3</i>	9,766	3,400	4,556	17,722	
8		<i>X5</i>	84,500	15,400	70,300	170,200	
9		<i>Z3</i>	11,000	6,539	8,900	26,439	
10		<i>Z4</i>	12,400	4,500	5,900	22,800	
11							

For Your Reference...

To **edit** a **Sparkline**:

1. Click on the cell or range containing the Sparkline(s)
2. Use the commands on the **Sparkline Tools: Design** tab to make the appropriate changes

Handy to Know...

- You can edit multiple Sparklines by selecting the cells in which they are located as a range.
- You can place a Sparkline in a cell containing data – the data and the Sparkline will simply appear together.

CREATING CUSTOM RULES

You can use logical formulas to specify formatting criteria to create more complex conditional formatting. For example, you may wish to change the font colour of values that are

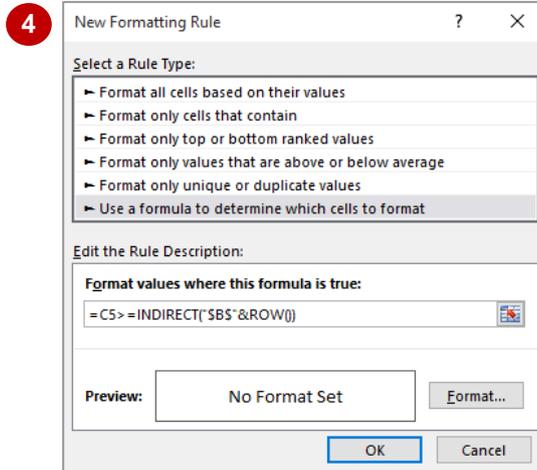
over target or budget, and use a different font colour for values that are under target or budget. You can edit an existing rule or create a new rule to apply a formula to the formatting criteria.

Try This Yourself:

Open File

Before starting this exercise you **MUST** open the file *Conditional Formatting_11.xlsx...*

- 1 Select the sales figures in cells **C5:C16**
- 2 Click on the **Home** tab, then in the **Styles** group click on **Conditional Formatting** and select **New Rule** to display the **New Formatting Rule** dialog box
- 3 Click on **Use a formula to determine which cells to format** to select it
- 4 Click in **Format values...** and type **=C5>=INDIRECT("\$B\$"&ROW())**
This formula checks each sales value in column C against its corresponding target value in column B...
- 5 Click on **[Format]** to display the **Format Cells** dialog box, then on the **Font** tab select **Bold** in **Font Style** and **Green** in **Colour**
- 6 Click on **[OK]** to close the **Format Cells** dialog box, then click on **[OK]** to close the **New Formatting Rule** dialog box to see how the conditional formatting formula affects your data
- 7 Repeat steps 1 to 6 to create a new rule with the formula **=C5<=INDIRECT("\$B\$"&ROW())** and make the formatting **Italic** and **Red**



	A	B	C	D	E	F	G
3						Previous	
4		Target	Sales	Status	Variance	Month	Trend
5	Sales Person A	20000	23,400	👉	3,400	25,494	👉 2,094
6	Sales Person B	20000	18,700	👎	-1,300	16,500	👎 -2,200
7	Sales Person C	20000	27,000	👍	7,000	23,400	👎 -3,600
8	Sales Person D	20000	22,509	👉	2,509	21,591	👎 -918
9	Sales Person E	20000	19,404	👎	-596	26,494	👍 7,090
10	Sales Person F	20000	24,344	👉	4,344	24,399	👉 55
11	Sales Person G	20000	18,654	👎	-1,346	15,400	👎 -3,254
12	Sales Person H	20000	24,209	👉	4,209	23,001	👎 -1,208
13	Sales Person I	20000	22,411	👉	2,411	20,000	👎 -2,411
14	Sales Person J	20000	32,595	👍	12,595	29,404	👎 -3,191
15	Sales Person K	20000	12,500	👎	-7,500	11,494	👎 -1,006
16	Sales Person L	20000	28,890	👍	8,890	27,494	👎 -1,396
17							

7

For Your Reference...

To **create new conditional formatting rules**:

1. Select the cell range to be formatted
2. On the **Home** tab click on **Conditional Formatting** and select **New Rule**
3. Use the **New Formatting Rule** dialog box to create the rule, then click on **[OK]**

Handy to Know...

- You can enter cell references in a formula by selecting cells directly in a worksheet. Selecting cells in the worksheet inserts absolute cell references. If you wish for Excel to adjust the references for each cell in the selected range, use relative cell references.

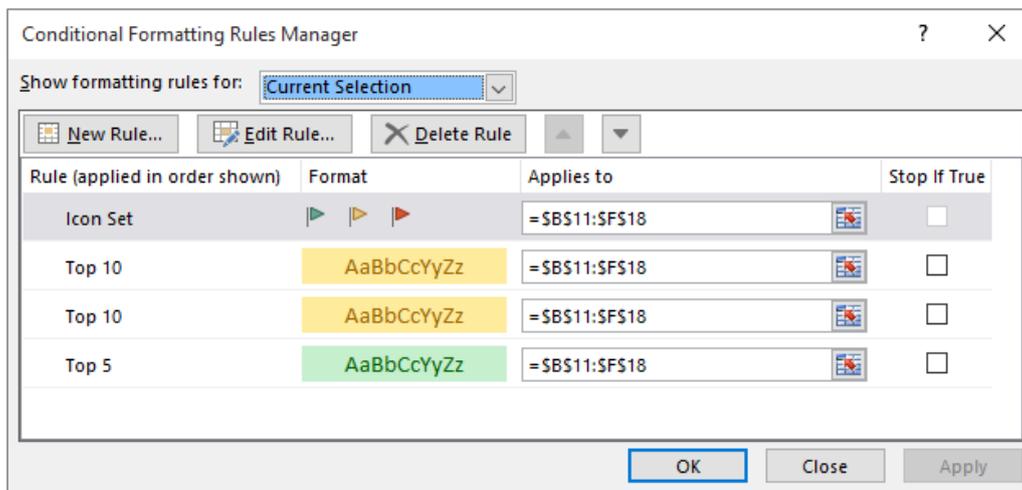
THE CONDITIONAL FORMATTING RULES MANAGER

Each rule that you apply to a cell range is controlled by the **Conditional Formatting Rules Manager**. You can use this feature to edit rules, change the order in which multiple rules are

evaluated, delete rules, or change any of the conditional formatting or formula criteria.

The Conditional Formatting Rules Manager

You can access the **Conditional Formatting Rules Manager** dialog box by selecting the cells that are controlled by the rules that you wish to change, clicking on the **Home** tab, then in the **Styles** group clicking on **Conditional Formatting** and selecting **Manage Rules**. In this dialog box you can specify whether you are changing the rules for the current selection of cells, the current worksheet, or another worksheet in the current workbook, before changing the order of precedence for rule evaluation and editing, adding and deleting rules as required. When you have made all of the required changes, click on **[Apply]**, then click on **[OK]**.



Conditional Formatting Rules Precedence

When two or more conditional formatting rules apply to a range of cells, these rules are evaluated in order of precedence by how they are listed in the dialog box. A rule that is higher in the list has greater precedence than a rule that is lower in the list. By default, new rules are always added to the top of the list and therefore have a higher precedence; however you can change the order of precedence by using the **[Move Up]** and **[Move Down]** arrow buttons in the dialog box.

The Stop If True Check Box

Clicking in the **Stop If True** check box for a rule so that it appears ticked will cause the conditional formatting process to stop after applying that rule if it is true for a cell. For example, if the first rule in the list is applied to cells with a value lower than 100 and **Stop If True** is ticked for this rule, the conditional formatting process will stop here and no other rules will be applied to cells with a value lower than 100. However, the process will continue for cells to which that rule does not apply (i.e. cells with values higher than 100). If **Stop If True** is not selected, subsequent rules can be applied in conjunction with each other.

Note that you cannot select or clear the **Stop If True** check box if the rule formats by using a data bar, colour scale or icon set.

MANAGING RULES

Conditional formatting rules can be created, edited, deleted and viewed in the **Conditional Formatting Rules Manager** dialog box. When two or more conditional formatting rules apply to

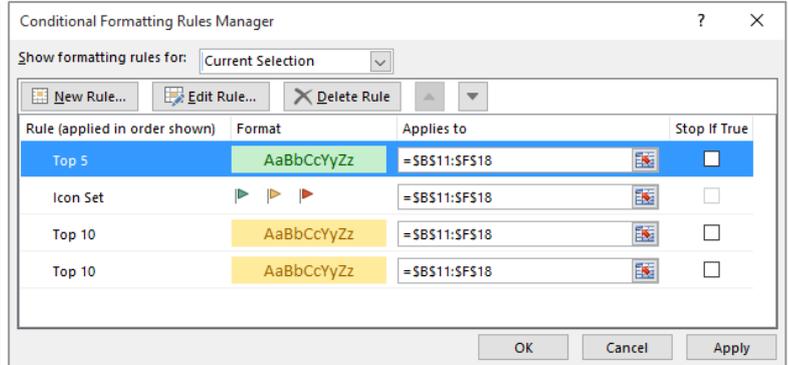
a range of cells, these rules are evaluated in the order in which they are listed in this dialog box. You can change the order to give some rules precedence over others.

Try This Yourself:

Open File

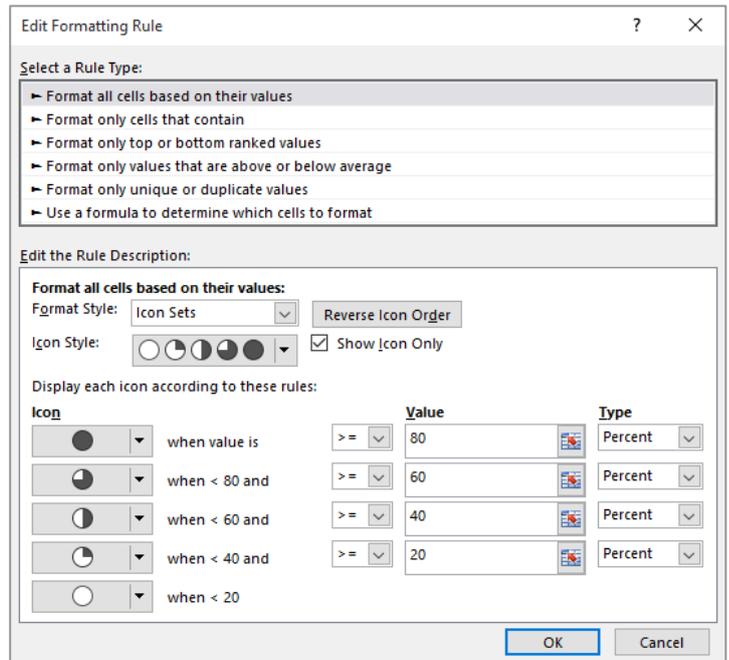
Before starting this exercise you **MUST** open the file *Conditional Formatting_12.xlsx...*

- 1 Select the range **B11:F18**, click on the **Home** tab, then in the **Styles** group click on **Conditional Formatting** and select **Manage Rules**
- 2 Click on the last rule (**Top 5**), then click on **Move Up** three times to move it to the top of the list
- 3 Click on **[Apply]** to apply the change to the worksheet
- 4 Click on the **Icon Set** rule, then click on **[Edit Rule]** to display the **Edit Formatting Rule** dialog box
- 5 Click on the drop arrow for **Icon Style** and select **5 Quarters**, click on **Show Icon Only** so it appears ticked as shown, click on **[OK]** then click on **[Apply]**
- 6 Click on the first **Top 10** rule to select it, click on **[Edit Rule]**, in **Select a Rule Type** click on **Format only values that are above or below average** to change the rule type, click on **[OK]**, then click on **[Apply]**
- 7 Click on the remaining **Top 10** rule to select it, then click on **[Delete Rule]**
The rule is removed from the list...
- 8 Click on **[Apply]**, then click on **[OK]** to return to the worksheet



2

5



For Your Reference...

To **manage conditional formatting options**:

1. Select the cell range containing the formatting to manage
2. On the **Home** tab, click on **Conditional Formatting** and select **Manage Rules**
3. Select the rule you wish to change, then make the necessary changes

Handy to Know...

- If you copy cells that have conditional formatting applied to other workbooks, the formatting is not copied or applied.
- You can edit rules using the **More Rules** option on each of the individual conditional formatting rules options, such as **Data Bars**, **Colour Scales** and so on.

CHAPTER 7 TEXT FUNCTIONS

InFocus

The **Text** functions provided with Microsoft Excel are designed to help you manipulate text strings. They are ideal for working with text fields when you have large volumes of data to convert

In this session you will:

- ✓ gain an understanding of **TEXT** functions
- ✓ learn how to use the **PROPER** function
- ✓ learn how to use the **UPPER** and **LOWER** functions
- ✓ learn how to use the **CONCATENATE** function
- ✓ learn how to use the **LEFT** and **RIGHT** functions
- ✓ learn how to use the **MID** function
- ✓ learn how to use the **LEN** function
- ✓ learn how to use the **SUBSTITUTE** function
- ✓ learn how to use the **T** function
- ✓ learn how to use the **TEXT** function
- ✓ learn how to use the **VALUE** function.

UNDERSTANDING TEXT FUNCTIONS

Although most people perceive Excel's primary function to be the manipulation of numbers, Excel also provides a range of functions for performing text manipulations. For more information on each

function, you can refer to the **Function reference** section located on the **Home** page of Excel **Help**. For reference purposes only, the text functions are listed below.

Text Functions

Text functions are useful in situations where you might need to manipulate data that you receive from another source where the layout is not consistent with the layout that you have used. For instance, data retrieved from a database may place all address fields into a single cell, rather than separating the name, number, street, town and postcode data. The text might be in the wrong case (upper case instead of lower case) or contain non-printable characters.

Below is a list of the available text functions

BAHTEXT	Converts a number to text
CHAR	Returns the character specified by the code number from the character set of your computer
CLEAN	Removes all nonprintable characters from text
CODE	Returns a numeric code for the first character in a text string
CONCATENATE	Joins strings of text into one continuous string
DOLLAR	Converts a number to text, using currency format
EXACT	Checks if two strings are the same
FIND	Returns the position of one text string within another
FIXED	Rounds a number as specified and returns the value as text
LEFT	Returns a specified number of characters from the left (start) of a string
LEN	Returns the number of characters in a string
LOWER	Converts all letters in a string to lowercase
MID	Returns a specified number of characters from the middle of a string
PROPER	Converts a text string to proper case
REPLACE	Replaces part of a text string with another text string
REPT	Repeats text a specified number of times
RIGHT	Returns a specified number of characters from the right (end) of a string
SEARCH	Returns the position number of the first occurrence of a specified character
SUBSTITUTE	Replaces existing text with new text in a text string
T	Checks whether a value is text
TEXT	Converts a value to text in a specified number format
TRIM	Removes all spaces from text strings except for single spaces between words
UPPER	Converts a string of text to uppercase
VALUE	Converts a text string that represents a number, to a number

USING THE PROPER FUNCTION

The **PROPER** function is designed to convert a text string to what is known as **proper case**. This is where each word in the string begins with a capital (uppercase) letter and the rest of each

word appears in lowercase. The **PROPER** function is ideal for converting uppercase text to a combination of upper and lower case text, which is much easier to read.

Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file *Text Functions_1.xlsx...*

- 1 On the **PROPER** worksheet tab, click in cell **F2**
- 2 Type **=PROPER(B2)**
- 3 Press **Enter** to complete the formula
The upper case first name is converted to proper case...
- 4 Click in cell **F2**, then click on and drag the fill handle across to cell **G2** to copy the formula for the surname
- 5 Ensure that **F2:G2** is selected, then double-click on the fill handle to copy the formula down the table

	A	B	C	D	E	F	G	H
1	No	First Name	Last Name	Suburb	Type			
2	1	ROGER	WILSON	Brighton	Gold	=PROPER(B2)		
3	2	MARY	DRISCOLL	South Melbourne	Theatre			
4	3	KATE	FU	Bentleigh	Silver			
5	4	JULIE	GREGORY	Ascot Vale	Junior			
6	5	PETER	HARRISON	Traralgon	Theatre			
7	6	HAROLD	LOWE	Sunshine	Theatre			
8	7	OSCAR	RENN	Moonee Ponds	Silver			

2

	A	B	C	D	E	F	G	H
1	No	First Name	Last Name	Suburb	Type			
2	1	ROGER	WILSON	Brighton	Gold	Roger		
3	2	MARY	DRISCOLL	South Melbourne	Theatre			
4	3	KATE	FU	Bentleigh	Silver			
5	4	JULIE	GREGORY	Ascot Vale	Junior			
6	5	PETER	HARRISON	Traralgon	Theatre			
7	6	HAROLD	LOWE	Sunshine	Theatre			
8	7	OSCAR	RENN	Moonee Ponds	Silver			

3

	A	B	C	D	E	F	G	H
1	No	First Name	Last Name	Suburb	Type			
2	1	ROGER	WILSON	Brighton	Gold	Roger	Wilson	
3	2	MARY	DRISCOLL	South Melbourne	Theatre			
4	3	KATE	FU	Bentleigh	Silver			
5	4	JULIE	GREGORY	Ascot Vale	Junior			
6	5	PETER	HARRISON	Traralgon	Theatre			
7	6	HAROLD	LOWE	Sunshine	Theatre			
8	7	OSCAR	RENN	Moonee Ponds	Silver			

4

	A	B	C	D	E	F	G	H
1	No	First Name	Last Name	Suburb	Type			
2	1	ROGER	WILSON	Brighton	Gold	Roger	Wilson	
3	2	MARY	DRISCOLL	South Melbourne	Theatre	Mary	Driscoll	
4	3	KATE	FU	Bentleigh	Silver	Kate	Fu	
5	4	JULIE	GREGORY	Ascot Vale	Junior	Julie	Gregory	
6	5	PETER	HARRISON	Traralgon	Theatre	Peter	Harrison	
7	6	HAROLD	LOWE	Sunshine	Theatre	Harold	Lowe	
8	7	OSCAR	RENN	Moonee Ponds	Silver	Oscar	Renn	

5

For Your Reference...

PROPER(text)

This function converts the specified **text** so that the first letter of every word appears in uppercase and the remainder of the word(s) appear in lowercase.

Handy to Know...

- As well as using the **PROPER** function to manipulate text case, you can also use the **UPPER** and **LOWER** functions.

USING THE UPPER AND LOWER FUNCTIONS

The **UPPER** function is designed to convert a text string into all uppercase (capital) letters. Any existing uppercase letters retain their appearance, only lowercase letters are

converted. The **LOWER** function is designed to convert a text string to lowercase and is ideal for converting text for web or email addresses and the like.

Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file *Text Functions_2.xlsx...*

- 1 Click on the **UPPER** worksheet tab, then click in cell **F2**
- 2 Type **=UPPER(E2)**
- 3 Press to complete the formula
The Type text is returned and converted to uppercase...
- 4 Click in cell **F2**, then double-click on the fill handle to copy the formula down the table
Now let's try the LOWER function...
- 5 Click on the **LOWER** worksheet tab, then click in cell **D2**
- 6 Type **=LOWER(C2)**
- 7 Press to complete the formula
- 8 Click in cell **D2**, then double-click on the fill handle to copy the formula down the table

	A	B	C	D	E	F	G	H
1	No	First Name	Last Name	Suburb	Type			
2	1	Roger	Wilson	Brighton	Gold	=UPPER(E2)		
3	2	Mary	Driscoll	South Melbourne	Theatre			
4	3	Kate	Fu	Bentleigh	Silver			
5	4	Julie	Gregory	Ascot Vale	Junior			
6	5	Peter	Harrison	Traralgon	Theatre			
7	6	Harold	Lowe	Sunshine	Theatre			
8	7	Oscar	Renn	Moonee Ponds	Silver			

2

	A	B	C	D	E	F	G	H
1	No	First Name	Last Name	Suburb	Type			
2	1	Roger	Wilson	Brighton	Gold	GOLD		
3	2	Mary	Driscoll	South Melbourne	Theatre			
4	3	Kate	Fu	Bentleigh	Silver			
5	4	Julie	Gregory	Ascot Vale	Junior			
6	5	Peter	Harrison	Traralgon	Theatre			
7	6	Harold	Lowe	Sunshine	Theatre			
8	7	Oscar	Renn	Moonee Ponds	Silver			

3

	A	B	C	D	E	F	G	H	I
1	No	First Name	Last Name	Surname for Web Address					
2	1	Roger	Wilson	wilson					
3	2	Mary	Driscoll	driscoll					
4	3	Kate	Fu	fu					
5	4	Julie	Gregory	gregory					
6	5	Peter	Harrison	harrison					
7	6	Harold	Lowe	lowe					
8	7	Oscar	Renn	renn					

8

For Your Reference...

UPPER(text)

This function converts all specified text to uppercase.

LOWER(text)

This function converts all specified text to lowercase.

Handy to Know...

- As well as **UPPER** and **LOWER**, another handy function is **PROPER**. This function converts the first letter of each word in a text string to uppercase and all other characters to lower text.

USING THE CONCATENATE FUNCTION

The **CONCATENATE** function is designed to combine several strings of text into one. It is very useful for creating new cell values that are a combination of other cells, such as combining the

first name and surname to create a complete name for a client. It can also be used to include text that does not appear anywhere else in a cell, such as spaces, symbols or other text.

Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file *Text Functions_3.xlsx...*

- 1 Click on the **CONCATENATE** worksheet tab then click in cell **D2**
- 2 Type **=CONCATENATE(B2, C2, "@alpheius.com.au")**
- 3 Press **Enter** to complete the formula

The formula has taken the First Name in cell B2, added the Surname in cell C2 and then added the text string to complete the email address...

- 4 Click in cell **D2**, then double-click on the fill handle to copy the formula down the table

	A	B	C	D	E	F	G	H	I
1	No	First Name	Last Name	E-Mail Address					
2	1	Roger	Wilson						
3	2	Mary	Driscoll						
4	3	Kate	Fu						
5	4	Julie	Gregory						
6	5	Peter	Harrison						
7	6	Harold	Lowe						
8	7	Oscar	Renn						

1

	A	B	C	D	E	F	G	H	I
1	No	First Name	Last Name	E-Mail Address					
2	1	Roger	Wilson	=CONCATENATE(B2,C2,"@alpheius.com.au")					
3	2	Mary	Driscoll	CONCATENATE(text1, [text2], [text3], [text4], ...)					
4	3	Kate	Fu						
5	4	Julie	Gregory						
6	5	Peter	Harrison						
7	6	Harold	Lowe						
8	7	Oscar	Renn						

2

	A	B	C	D	E	F	G	H	I
1	No	First Name	Last Name	E-Mail Address					
2	1	Roger	Wilson	RogerWilson@alpheius.com.au					
3	2	Mary	Driscoll						
4	3	Kate	Fu						
5	4	Julie	Gregory						
6	5	Peter	Harrison						
7	6	Harold	Lowe						
8	7	Oscar	Renn						

3

	A	B	C	D	E	F	G	H	I
1	No	First Name	Last Name	E-Mail Address					
2	1	Roger	Wilson	RogerWilson@alpheius.com.au					
3	2	Mary	Driscoll	MaryDriscoll@alpheius.com.au					
4	3	Kate	Fu	KateFu@alpheius.com.au					
5	4	Julie	Gregory	JulieGregory@alpheius.com.au					
6	5	Peter	Harrison	PeterHarrison@alpheius.com.au					
7	6	Harold	Lowe	HaroldLowe@alpheius.com.au					
8	7	Oscar	Renn	OscarRenn@alpheius.com.au					

4

For Your Reference...

CONCATENATE(text1, text2, ...)

This function joins the text in **text1**, **text2**, etc. together to form a single text string.

Handy to Know...

- As well as using the **CONCATENATE** function to join text, you can use the **ampersand (&)** symbol. For instance, if cells **B2** and **C2** contained the text **Fred** and **Wilson** respectively, the formula **=B2&C2** will return the result **FredWilson**.

USING THE LEFT AND RIGHT FUNCTIONS

The **LEFT** and **RIGHT** functions are used to extract characters from text strings. **LEFT** will extract the specified number of characters from the left side of the string, whereas **RIGHT** will

extract from the right end of the string. These functions might prove useful in a data list, where multiple pieces of information are provided in a single cell and you only want a part of that data.

Try This Yourself:

Open File

Before starting this exercise you **MUST** open the file *Text Functions_4.xlsx...*

1 On the **LRM** worksheet tab, click in cell **B2**

Look at the data in the first column – the part number consists of a country (or continent), city and part number code. In this instance, we want to be able to separate the three elements to use them individually...

2 Type **=LEFT(A2,3)**

3 Press **Enter** to complete the formula

The first three characters have been extracted, giving us the country code...

4 Click in cell **D2** and type **=RIGHT(A2,3)**

5 Press **Enter** to complete the formula

The part number is extracted...

6 Select **B2:D2**, then double-click on the fill handle to copy the formulas down the table

	A	B	C	D	E	F	G	H
1	PART NUMBER	COUNTRY	CITY	PART				
2	AUSSYD1	=LEFT(A2,3)						
3	AUSSYD289							
4	USAIND877							
5	EURBEL334							
6	AUSBRI103							
7	AUSADL334							
8	USAIND877							

2

	A	B	C	D	E	F	G	H
1	PART NUMBER	COUNTRY	CITY	PART				
2	AUSSYD103	AUS						
3	AUSSYD289							
4	USAIND877							
5	EURBEL334							
6	AUSBRI103							
7	AUSADL334							
8	USAIND877							

3

	A	B	C	D	E	F	G	H
1	PART NUMBER	COUNTRY	CITY	PART				
2	AUSSYD103	AUS		=RIGHT(A2,3)				
3	AUSSYD289							
4	USAIND877							
5	EURBEL334							
6	AUSBRI103							
7	AUSADL334							
8	USAIND877							

4

	A	B	C	D	E	F	G	H
1	PART NUMBER	COUNTRY	CITY	PART				
2	AUSSYD103	AUS		103				
3	AUSSYD289	AUS		289				
4	USAIND877	USA		877				
5	EURBEL334	EUR		334				
6	AUSBRI103	AUS		103				
7	AUSADL334	AUS		334				
8	USAIND877	USA		877				

6

For Your Reference...

LEFT(text, num_chars)

This function returns the specified **number of characters** from the **left** side of a **text** string.

RIGHT(text, num_chars)

This function returns the specified **number of characters** from the **right** side of a **text**.

Handy to Know...

- The **LEFT** and **RIGHT** functions work best when the data is consistent. For instance, if all the text strings have a three-digit code that you want to extract, there are no problems, but if that code consists of more or less digits in some strings, you will have problems.

USING THE MID FUNCTION

The **MID** function is designed to extract characters from the middle of a text string. It works the same as the **LEFT** and **RIGHT** functions. The difference being that the **MID**

function enables you to indicate how many characters into the text string you want to extract from. For instance, by specifying 5, Excel will return the characters from the 5th character.

Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file *Text Functions_5.xlsx...*

- 1 Ensure that the **LRM** worksheet is active, then click in cell **C2**
- 2 Type **=MID(A2,4,3)**
This indicates to Excel that you want to return 3 characters starting with the 4th character in from the left...
- 3 Press **Enter** to complete the formula
Excel will return the three digit city code...
- 4 Click in cell **C2**, then double-click on the fill handle to copy the formula down the table

	A	B	C	D	E	F	G	H
1	PART NUMBER	COUNTRY	CITY	PART				
2	AUSSYD103	AUS		103				
3	AUSSYD289	AUS		289				
4	USAIND877	USA		877				
5	EURBEL334	EUR		334				
6	AUSBRI103	AUS		103				
7	AUSADL334	AUS		334				
8	USAIND877	USA		877				

1

	A	B	C	D	E	F	G	H
1	PART NUMBER	COUNTRY	CITY	PART				
2	AUSSYD103		=MID(A2,4,3)					
3	AUSSYD289	AUS		289				
4	USAIND877	USA		877				
5	EURBEL334	EUR		334				
6	AUSBRI103	AUS		103				
7	AUSADL334	AUS		334				
8	USAIND877	USA		877				

2

	A	B	C	D	E	F	G	H
1	PART NUMBER	COUNTRY	CITY	PART				
2	AUSSYD103	AUS	SYD	103				
3	AUSSYD289	AUS		289				
4	USAIND877	USA		877				
5	EURBEL334	EUR		334				
6	AUSBRI103	AUS		103				
7	AUSADL334	AUS		334				
8	USAIND877	USA		877				

3

	A	B	C	D	E	F	G	H
1	PART NUMBER	COUNTRY	CITY	PART				
2	AUSSYD103	AUS	SYD	103				
3	AUSSYD289	AUS	SYD	289				
4	USAIND877	USA	IND	877				
5	EURBEL334	EUR	BEL	334				
6	AUSBRI103	AUS	BRI	103				
7	AUSADL334	AUS	ADL	334				
8	USAIND877	USA	IND	877				

4

For Your Reference...

MID(text, start_num, num_chars)

This function returns the specified **number of characters** from the middle of a **text** string, where **start_num** indicates the position of the first character to extract.

Handy to Know...

- To return characters from the left or right side of a text string, use the **LEFT** and **RIGHT** functions respectively.

USING THE LEN FUNCTION

The **LEN** function enables you to return the number of characters in a cell containing a text string. The function will count characters including leading, trailing and any other spaces.

LEN can be used in conjunction with other functions, such as **LEFT** or **RIGHT**, to return exact numbers of characters, or to report text lengths if this impacts elsewhere in a worksheet.

Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file *Text Functions_6.xlsx...*

- 1 Click on the **LEN** worksheet tab, then click in cell **E2**
- 2 Type **=LEN(D2)**
- 3 Press **Enter** to complete the formula
There are 11 characters in the email name...
- 4 Click in cell **E2**, then double-click on the fill handle to copy the formula down the table

	A	B	C	D	E	F	G
1	No	First Name	Last Name	Email Name	Length		
2	1	Roger	Wilson	rogerwilson			
3	2	Mary	Driscoll	marydriscoll			
4	3	Kate	Fu	katefu			
5	4	Julie	Gregory	juliegregory			
6	5	Peter	Harrison	peterharrison			
7	6	Harold	Lowe	haroldlowe			
8	7	Oscar	Renn	oscarrenn			

1

	A	B	C	D	E	F	G
1	No	First Name	Last Name	Email Name	Length		
2	1	Roger	Wilson	rogerwilson	=LEN(D2)		
3	2	Mary	Driscoll	marydriscoll			
4	3	Kate	Fu	katefu			
5	4	Julie	Gregory	juliegregory			
6	5	Peter	Harrison	peterharrison			
7	6	Harold	Lowe	haroldlowe			
8	7	Oscar	Renn	oscarrenn			

2

	A	B	C	D	E	F	G
1	No	First Name	Last Name	Email Name	Length		
2	1	Roger	Wilson	rogerwilson	11		
3	2	Mary	Driscoll	marydriscoll			
4	3	Kate	Fu	katefu			
5	4	Julie	Gregory	juliegregory			
6	5	Peter	Harrison	peterharrison			
7	6	Harold	Lowe	haroldlowe			
8	7	Oscar	Renn	oscarrenn			

3

	A	B	C	D	E	F	G
1	No	First Name	Last Name	Email Name	Length		
2	1	Roger	Wilson	rogerwilson	11		
3	2	Mary	Driscoll	marydriscoll	12		
4	3	Kate	Fu	katefu	6		
5	4	Julie	Gregory	juliegregory	12		
6	5	Peter	Harrison	peterharrison	13		
7	6	Harold	Lowe	haroldlowe	10		
8	7	Oscar	Renn	oscarrenn	9		

4

For Your Reference...

LEN(text)

Returns the length of a specified **text** string.

Handy to Know...

- The **LEN** function calculates the number of characters in a string including space characters.

USING THE SUBSTITUTE FUNCTION

The ***SUBSTITUTE*** function is designed to replace old text with new text. This might be useful for making a universal change to email data if a company name changes. It might also

be useful in the situation where you have imported text and you want to update it with new information. The function enables you to substitute all instances of the text or just a specific one.

Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file *Text Functions_7.xlsx...*

- 1 Click on the ***SUBSTITUTE*** worksheet tab, then click in cell **E2**
 - 2 Type **=SUBSTITUTE(D2,"alpheius","AGE")**
 - 3 Press to complete the formula
- The text "alpheius" in the email address is replaced with "AGE"...
- 4 Click in cell **E2**, then double-click on the fill handle to copy the formula down the table

	D	E	F	G
1	Email Address	New Email Address		
2	rogerwilson@alpheius.com.au			
3	marydriscoll@alpheius.com.au			
4	katefu@alpheius.com.au			
5	juliegregory@alpheius.com.au			
6	peterharrison@alpheius.com.au			
7	haroldlowe@alpheius.com.au			
8	oscarrenn@alpheius.com.au			

1

	D	E	F	G
1	Email Address	New Email Address		
2	rogerwilson@alpheius.com.au	=SUBSTITUTE(D2,"alpheius","AGE")		
3	marydriscoll@alpheius.com.au			
4	katefu@alpheius.com.au			
5	juliegregory@alpheius.com.au			
6	peterharrison@alpheius.com.au			
7	haroldlowe@alpheius.com.au			
8	oscarrenn@alpheius.com.au			

2

	D	E	F	G
1	Email Address	New Email Address		
2	rogerwilson@alpheius.com.au	rogerwilson@AGE.com.au		
3	marydriscoll@alpheius.com.au			
4	katefu@alpheius.com.au			
5	juliegregory@alpheius.com.au			
6	peterharrison@alpheius.com.au			
7	haroldlowe@alpheius.com.au			
8	oscarrenn@alpheius.com.au			

3

	D	E	F	G
1	Email Address	New Email Address		
2	rogerwilson@alpheius.com.au	rogerwilson@AGE.com.au		
3	marydriscoll@alpheius.com.au	marydriscoll@AGE.com.au		
4	katefu@alpheius.com.au	katefu@AGE.com.au		
5	juliegregory@alpheius.com.au	juliegregory@AGE.com.au		
6	peterharrison@alpheius.com.au	peterharrison@AGE.com.au		
7	haroldlowe@alpheius.com.au	haroldlowe@AGE.com.au		
8	oscarrenn@alpheius.com.au	oscarrenn@AGE.com.au		

4

For Your Reference...

SUBSTITUTE(text, text_old, text_new, instance_num)

This function replaces the specified ***text_old*** with the specified ***text_new*** within a specified ***text*** string. ***instance_num*** indicates which occurrence to change.

Handy to Know...

- Using the ***SUBSTITUTE*** function, the ***instance_num*** parameter enables you to specify which occurrence of the old text you want to replace. If you specify an ***instance_num***, only that occurrence is changed, otherwise all occurrences are changed.

USING THE T FUNCTION

The **T** function is a left over from Lotus days and is used to return the text referred to by a value. If a cell contains content other than text, no value will be returned. Generally, you will not need to

use this function, as Excel automatically converts values as necessary. The function is primarily provided for compatibility with other spreadsheet programs.

Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file *Text Functions_8.xlsx...*

1 Click on the **T** and **VALUE** worksheet tab, then click in cell **E3**

2 Type **=T(D3)**

3 Press **Enter** to complete the formula

The value "Rainfall" is returned as the value in cell D3 is text...

4 Click in cell **E3**, then double-click on the fill handle to copy the formula down the table

Only those formulas that refer to a cell containing a text value will return a value

	A	B	C	D	E	F	G	H	I
1									
2		Date		Forecast	Conditions				
3	7/3/2011		Monday	Raining					
4				19					
5				35%					
6	8/3/2011		Tuesday	30					
7				75%					
8				Sunny					

1

	A	B	C	D	E	F	G	H	I
1									
2		Date		Forecast	Conditions				
3	7/3/2011		Monday	Raining	=T(D3)				
4				19					
5				35%					
6	8/3/2011		Tuesday	30					
7				75%					
8				Sunny					

2

	A	B	C	D	E	F	G	H	I
1									
2		Date		Forecast	Conditions				
3	7/3/2011		Monday	Raining	Raining				
4				19					
5				35%					
6	8/3/2011		Tuesday	30					
7				75%					
8				Sunny					

3

	A	B	C	D	E	F	G	H	I
1									
2		Date		Forecast	Conditions				
3	7/3/2011		Monday	Raining	Raining				
4				19					
5				35%					
6	8/3/2011		Tuesday	30					
7				75%					
8				Sunny	Sunny				

4

For Your Reference...

T(value)

Returns the text referred to by a **value**.

Handy to Know...

- As well as the **T** function, the **VALUE** function is also a left-over from the Lotus days and generally not used in Excel formulas. However, both functions are still provided for compatibility with other spreadsheet applications.

USING THE TEXT FUNCTION

The **TEXT** function enables you to convert numeric values to text and apply a specified number format. The benefit of applying the **TEXT** function, as opposed to applying a number

format, is that the value will be converted to formatted text and no longer used in calculations. This is useful if you want to display numbers combined with text or symbols.

Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file *Text Functions_9.xlsx...*

- 1 Click on the **TEXT** worksheet tab, then click in cell **D2**

In this example we will calculate the Invoice amount based on the Charge Period. If it is over 12 hours the Price will be invoiced on a daily rate, otherwise it will be invoiced on an hourly rate...

- 2 Type `=IF(C2>12,(TEXT(B2,"$0.00")&" per day"),(TEXT(B2,"$0.00") & "per hour"))`

The formula has been split here due to space constraints, but it should be typed as one continual string, as shown...

- 3 Press **Enter** to complete the formula, then double-click on the border between column **D** and column **E** to resize column **D**

- 4 Click in cell **D2**, then double-click on the fill handle to copy the formula down the table

	A	B	C	D	E	F	G	H	I
1	ITEM	PRICE	CHARGE PERIOD	INVOICE					
2	A	40	24						
3	B	50	2						
4	C	34	3						
5	D	22	45						
6	E	65	33						
7	F	76	6						
8	G	77	2						

1

	A	B	C	D	E	F	G	H	I
1	ITEM	PRICE	CHARGE PERIOD	INVOICE					
2	A	40	24	=IF(C2>12,					
3	B	50	2	(TEXT(B2,					
4	C	34	3	"\$0.00"&					
5	D	22	45	"per day")					
6	E	65	33	,(TEXT(B2,					
7	F	76	6	"\$0.00")					
8	G	77	2	&" per					

2

	A	B	C	D	E	F	G	H	I
1	ITEM	PRICE	CHARGE PERIOD	INVOICE					
2	A	40	24	\$40.00per day					
3	B	50	2						
4	C	34	3						
5	D	22	45						
6	E	65	33						
7	F	76	6						
8	G	77	2						

3

	A	B	C	D	E	F	G	H	I
1	ITEM	PRICE	CHARGE PERIOD	INVOICE					
2	A	40	24	\$40.00per day					
3	B	50	2	\$50.00perhour					
4	C	34	3	\$34.00perhour					
5	D	22	45	\$22.00per day					
6	E	65	33	\$65.00per day					
7	F	76	6	\$76.00perhour					
8	G	77	2	\$77.00perhour					

4

For Your Reference...

TEXT(value, format_text)

This function converts a **value** to text in aspecified number **format**.

Handy to Know...

- The **format_text** parameter of the **TEXT** function is a **Number** format written in text form. You can select any format from the **Number** tab in the **Format Cells** dialog box, except for the **General** number format.

USING THE VALUE FUNCTION

The **VALUE** function converts a text string that resembles a number, into a number. Like the **T** function, this function is a left-over from the Lotus days and is generally not used a lot in Excel now.

It is still incorporated for compatibility with other spreadsheet applications. It might be useful in converting numbers that have been imported and converted to text as a part of that process.

Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file *Text Functions_10.xlsx*...

- 1 Click on the **T** and **VALUE** worksheet tab, then click in cell **A3**

Notice that although the cell content appears like a date, it is in fact a text field – the **General** format is displayed in the **Number** group on the **HOME** tab...

- 2 Click in cell **B3** and type **=VALUE(A3)**

- 3 Press to complete the formula

The value from cell **A3** is copied across and converted to a serial number – let's apply a date format to the cell...

- 4 Click in cell **B3**, then click on the dialog box launcher for the **Number** group on the **Home** tab to display the **Format Cells** dialog box

- 5 On the **Number** tab, click on **Date** in **Category**, click on **14/3/12**, then click on **[OK]** to apply the format

- 6 Repeat steps 2 to 5 for cells **B6**, **B9**, **B12** and **B15**

1

	A	B	C	D	E	F	G
1							
2		Date		Forecast	Conditions		
3	7/3/2011		Monday	Raining	Raining		
4				19			
5				35%			
6	8/3/2011		Tuesday	30			
7				75%			
8				Sunny	Sunny		

2

	A	B	C	D	E	F	G
1							
2		Date		Forecast	Conditions		
3	7/3/2011	=VALUE(A3)		Raining	Raining		
4				19			
5				35%			
6	8/3/2011		Tuesday	30			
7				75%			
8				Sunny	Sunny		

3

	A	B	C	D	E	F	G
1							
2		Date		Forecast	Conditions		
3	7/3/2011	40609	Monday	Raining	Raining		
4				19			
5				35%			
6	8/3/2011		Tuesday	30			
7				75%			
8				Sunny	Sunny		

5

	A	B	C	D	E	F	G
1							
2		Date		Forecast	Conditions		
3	7/3/2011	7/3/11	Monday	Raining	Raining		
4				19			
5				35%			
6	8/3/2011		Tuesday	30			
7				75%			
8				Sunny	Sunny		

For Your Reference...

VALUE(text)

This function converts a **text** string to a number.

Handy to Know...

- For the **VALUE** function to work, the text string must be in a number, date or time format recognised by Excel. If this is not the case, **#VALUE!** is returned.

CHAPTER 8 PIVOTTABLES

InFocus

PivotTables can help you make sense of tabular (aka *list*) data.

While you are most likely used to creating numerical models, Excel also allows you to record data in a list format. For instance, it could be a list of daily sales, songs in your music collection, or a list of petty cash purchases over the last three months. Trying to make sense of the data in a small list is fairly straightforward but when your list extends to many dozens, hundreds, or even thousands of rows of information, trying to manually analyse the data and extract useful information can be tedious. Fortunately **PivotTables** makes this task much easier.

In this session you will:

- ✓ gain an understanding of **PivotTables** in **Excel**
- ✓ learn how to use the **Recommended PivotTable** feature
- ✓ learn how to create your own **PivotTable**
- ✓ learn how to drag fields into a **PivotTable** shell
- ✓ learn how to filter the data in a **PivotTable**
- ✓ learn how to clear a filter in a **PivotTable** report
- ✓ learn how to switch fields around in a **PivotTable** structure
- ✓ learn how to apply formatting to a **PivotTable**
- ✓ gain an understanding of **Slicers**
- ✓ learn how to insert a **Slicer**
- ✓ learn how to insert a timeline filter.

UNDERSTANDING PIVOTTABLES

If you have organised your data into columns and rows in Excel you have what is known as a database or a *list*. The first row in the list is normally used for column headings while each

row contains a separate *record* of data. In Excel **PivotTables** can be used to analyse lists and ask two-dimensional questions where one column of data can be compared against another.

The List

The following list shows the column or **field** headings across the top of the list. Each row in the list is equivalent to one record. Our example actually holds 102 records – although you couldn't easily tell without scrolling down.

Also, the list can't include any blank rows (records) or columns. The first blank row or column to be encountered is deemed to be the end of the list.

No	Month	Salesperson	Make	Price	Age Grouping	Payment Method
1	Jan	Mary O'Dwyer	Toyota	3,500	26-35	Cash
2	Jan	Justin Callaghan	BMW	15,900	46-55	Credit Card
3	Jan	Hector Smith	Toyota	12,500	36-45	Credit Card
4	Jan	Mary O'Dwyer	Ford	43,211	46-55	Bank Cheque
5	Jan	Mary O'Dwyer	Hyundai	15,600	26-35	Personal Cheque
6	Jan	Justin Callaghan	Ford	2,050	25 or less	Cash
7	Jan	Hector Smith	BMW	11,000	36-45	Credit Card
8	Jan	Hector Smith	Toyota	2,300	25 or less	Bank Cheque
9	Jan	Mary O'Dwyer	Toyota	3,900	26-35	Cash
10	Jan	Mary O'Dwyer	KIA	12,300	Over 55	Bank Cheque
11	Jan	Mary O'Dwyer	Volkswagen	43,200	46-55	Bank Cheque
12	Jan	Justin Callaghan	Mitsubishi	3,500	25 or less	Bank Cheque
13	Jan	Hector Smith	GMH	8,500	26-35	Bank Cheque
14	Jan	Hector Smith	KIA	500	25 or less	Cash
15	Jan	Mary O'Dwyer	Ford	15,000	36-45	Credit Card
16	Jan	Justin Callaghan	BMW	12,400	Over 55	Personal Cheque

Asking The Question

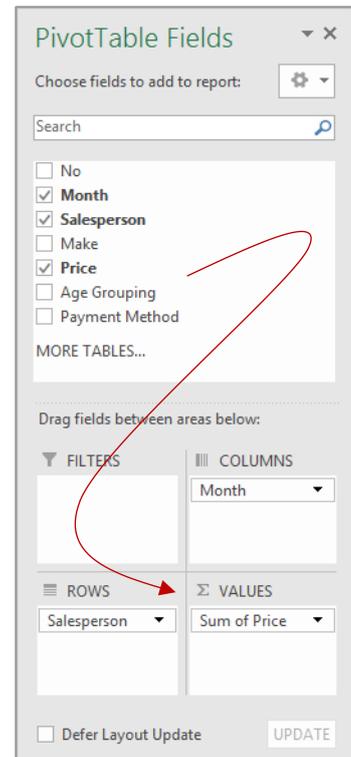
PivotTables are used to interrogate (ask questions of) the data in the list. For example, from the list above you may want to know how much has been made in sales by each salesperson over the three months of data in the list.

The question is phrased by using the **PivotTable Fields** pane.

The PivotTable Fields pane

The **PivotTable Fields** pane displays by default when you create a **PivotTable** or when an existing PivotTable is selected. It contains a list of all fields within the selected data as well as four areas – **FILTERS**, **COLUMNS**, **ROWS** and **VALUES**. By dragging the relevant **fields** into these special areas you can define how you want your data sorted and analysed.

In the example to the right, the **Salesperson** field has been dragged to the **ROWS** area, and the **Month** field has been dragged to the **COLUMNS** area. Since we want to know how much has been made by each salesperson in sales, the **Price** field has been dragged to the **VALUES** area where it is summed by default (since it is a numeric field).



Obtaining The Answer

As you drag fields into the relevant area, Excel will start analysing the data.

When the **Price** field was dragged to the **VALUES** area, the **PivotTable** created the table as shown. We now know that Hector Smith made 61,358 in the month of February.

	Jan	Feb	Mar	Grand Total
Hector Smith	109355	61358	159960	330673
Justin Callaghan	44020	21080	125810	190910
Mary O'Dwyer	167031	120840	182753	470624
Grand Total	320406	203278	468523	992207

RECOMMENDED PIVOTTABLES

The **Recommended PivotTables** feature is very handy as it can save you valuable time and provides you with useful suggestions for times when you may not be sure of what fields you

want to use to summarise your data. It provides you with several different options and shows you a preview of what the different **PivotTables** will look like and the kind of data they will supply you with.

Try This Yourself:

Open File

Before starting this exercise you **MUST** open the file *PivotTables_1.xlsx...*

- 1 Click anywhere in the list of sales
Excel will generate the list dimensions based on where you've clicked...
- 2 Click on the **Insert** tab, then click on **Recommended PivotTables** in the **Tables** group to display the **Recommended PivotTables** dialog box
Notice the left pane displays previews of various PivotTable options based on sorting your data by different factors...

- 3 Click on the previews in the left pane to view a larger preview in the right pane
- 4 Scroll down, then click on **Sum of Price by Make and Age Grouping** in the left pane and click on [OK]
A new sheet will be created with the PivotTable inserted. The PivotTable Fields pane will display to the right of the screen

Row Labels	25 or less	26-35	36-45	46-55	Over 55	Grand Total
BMW	10020	86470	22299	74050	27800	220639
Ford	16510	32100	34240	43211	4200	130261
GMH	3900	23000	8300	18900		54100
Hyundai		15600		18900		34500
KIA	6800	1200		18500	16500	43000
Mitsubishi	13500		4300	18900	6100	42800
Nissan	12120	32400	15600	67500		127620
Peugot	16399	4533		19900		40832
Renault	13069	7600	22120	14500		57289
Toyota	7799	15800	21790	35055	27000	107444
Volkswagen	11700			64400	57622	133722
Grand Total	111817	218703	128649	393816	139222	992207

For Your Reference...

To create a **quick PivotTable**:

1. Click anywhere in a valid list
2. Click on the **Insert** tab, then click on **Recommended PivotTables** in the **Tables** group
3. Click on the desired option, then click on [OK]

Handy to Know...

- Using the **Recommended PivotTables** dialog box, you can select to create a blank PivotTable by clicking on [Blank PivotTable]. You can also choose to change the data source by clicking on **Change Source Data** which will then display the **Choose Data Source** dialog box.

CREATING YOUR OWN PIVOTTABLE

Creating a **PivotTable** from scratch provides you with greater control. The **PivotTable** structure can be placed either in the current worksheet or in a new sheet in the workbook. When the

structure, which we'll refer to as a *shell*, is selected, the **PivotTable Fields** pane will display showing the fields that can be used – these fields are based on the headings in the data list.

Try This Yourself:

Open File

Before starting this exercise you **MUST** open the file *PivotTables_2.xlsx...*

1 Click on the **Data Sheet** worksheet tab to see the data list

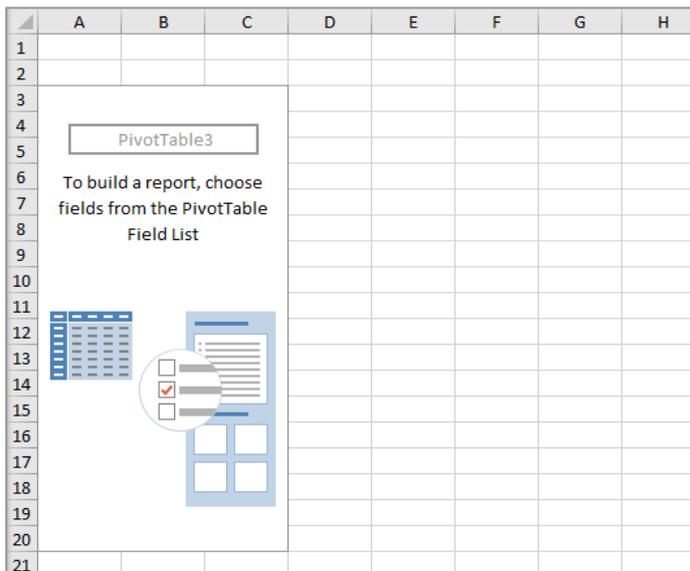
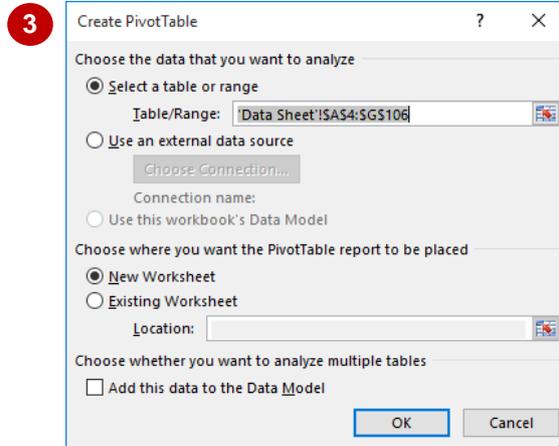
2 Click anywhere in the list
Excel will work out the list dimensions based on where you've clicked...

3 Click on the **Insert** tab, then click on **PivotTable** in the **Tables** group to display the **Create PivotTable** dialog box

This dialog box is used to specify the data list (which is already done) and also where to place the PivotTable...

4 Ensure that **Select a table or range** and **New Worksheet** are both selected, then click on **[OK]** to create a new sheet with a **PivotTable** shell

Notice the PivotTable Fields pane displays by default at the right of the screen



4

For Your Reference...

To **create** your **own PivotTable**:

1. Click anywhere in a valid list
2. Click on the **Insert** tab, then click on **PivotTable** in the **Tables** group
3. Ensure the table range is correct, choose the location then click on **[OK]**

Handy to Know...

- It is usually best to place the PivotTable in a separate worksheet away from the main data list. It's far too easy to accidentally delete list data or PivotTable settings when the two are in the same sheet.

DEFINING THE PIVOTTABLE STRUCTURE

The structure of the **PivotTable** is made up of **fields**. The fields available for use are presented to you in the **PivotTable Fields** pane which appears when a **PivotTable** is created. The

structure of the PivotTable is created by dragging the fields you want to use into special **areas** located at the bottom of the **PivotTable Fields** pane.

Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file *PivotTables_3.xlsx*...

1 In the **PivotTable Fields** pane, point to **Month** so the cursor changes to a four-headed arrow, as shown

2 Click and hold down the left mouse button, drag the **Month** field to the **COLUMNS** area of the pane, then release the mouse button

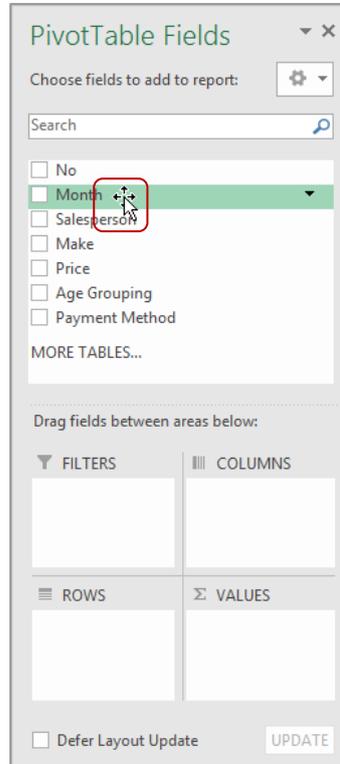
The months will now appear as columns in the PivotTable structure...

3 Repeat step 2 to position the **Salesperson** field in the **ROWS** area of the pane

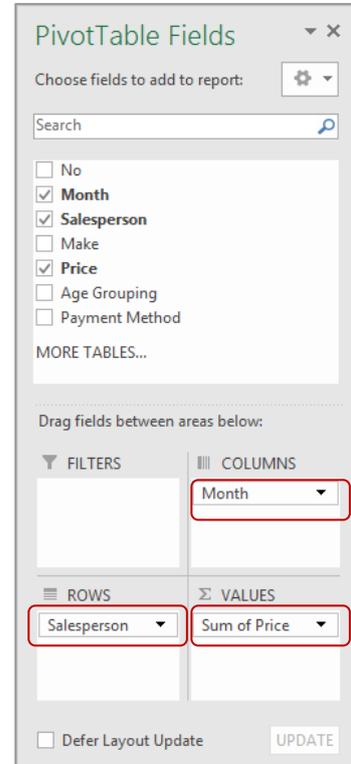
The Salesperson names will now appear in rows in the left column of the PivotTable structure...

4 Repeat step 2 to position the **Price** field in the **VALUES** area of the pane

Excel will sum the price (sales) by month and by salesperson



1



4

	A	B	C	D	E	F	G
1							
2							
3	Sum of Price	Column Labels					
4	Row Labels	Jan	Feb	Mar	Grand Total		
5	Hector Smith	109355	61358	159960	330673		
6	Justin Callaghan	44020	21080	125810	190910		
7	Mary O'Dwyer	167031	120840	182753	470624		
8	Grand Total	320406	203278	468523	992207		
9							

For Your Reference...

To **define** the **PivotTable structure**:

1. Point to the desired field in the **PivotTable** pane
2. Click and drag the field into the **COLUMNS**, **ROWS**, or **VALUES** area of the pane as required

Handy to Know...

- The **VALUES** area is almost always used for some form of numeric value (often currency) as it is here that data is *summed*, *counted*, *averaged*, and the like.

FILTERING A PIVOTTABLE

Unless you specify otherwise, all of the data in a list will be analysed when you create or modify a **PivotTable**. However, you can set up your **PivotTable** to work with specific data by applying

a **filter**. This can be done by dragging an additional variable (field) to the **FILTERS** area in the **PivotTable Fields** pane.

Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file *PivotTables_4.xlsx*...

- 1 In the **PivotTable Fields** pane, point to the **Age Grouping** field, then click and drag the field to the **FILTERS** area of the pane
- 2 In the worksheet, click on the drop arrow that has appeared to the right of the heading **Age Grouping (All)** to display a list of all of the values in the field
- 3 Click on **25 or less** to select this option, then click on **[OK]** to see the summed sales for customers aged 25 or under
Notice in the worksheet and in the PivotTable Fields pane a filter icon has appeared on the drop arrow for the Age Grouping field...
- 4 Repeat step 3 for some of the other age grouping options
- 5 Repeat step 2, then click on **Select Multiple Items** so it appears with a tick
- 6 Ensure no other options are selected, click on **46 – 55** and **Over 55** so that they both appear with a tick, then click on **[OK]**

2

Age Grouping	(All)	Feb	Mar	Grand Total
	25 or less	61358	159960	330673
	26-35	21080	125810	190910
	36-45	120840	182753	470624
	46-55	203278	468523	992207
	Over 55			

3

Age Grouping	25 or less	Feb	Mar	Grand Total
	Sum of Price			
	Row Labels	Jan		
	Hector Smith	6700	27019	14098
	Justin Callaghan	11220	4300	7620
	Mary O'Dwyer	14900	12740	13220
	Grand Total	32820	44059	34938

6

Age Grouping	(Multiple Items)	Feb	Mar	Grand Total
	Sum of Price			
	Row Labels	Jan		
	Hector Smith	38555	17900	80472
	Justin Callaghan	28300		21300
	Mary O'Dwyer	98711	106100	141700
	Grand Total	165566	124000	243472

For Your Reference...

To **filter** a **PivotTable**:

1. Drag the field you wish to use as a filter criteria to the **FILTERS** area
2. Click on the filter drop arrow in the **PivotTable**
3. Click on the filter criteria and click on **[OK]**

Handy to Know...

- There are also filter drop arrows for **Column Labels** and **Row Labels**.

CLEARING A REPORT FILTER

Report filters provide another dimension to **PivotTables** allowing you to be selective in the data that is actually analysed. When you no longer require the filtering operation you can

simply advise the filter that you wish to see all of the data again. Alternatively, if you no longer need to retain the filter you can remove the entire filter field from the **FILTERS** area.

Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file *PivotTables_5.xlsx*...

1 In the worksheet click on the drop arrow to the right of **Age Grouping** to see the filter list

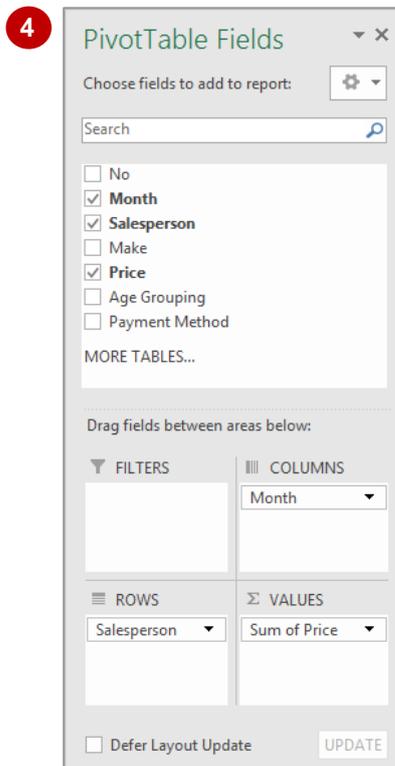
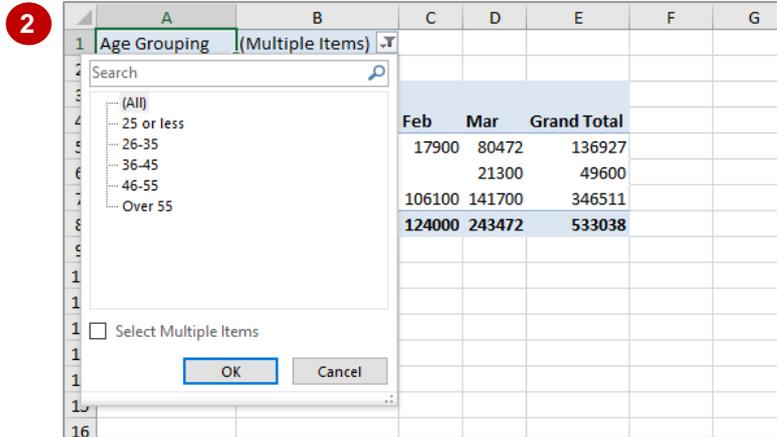
2 Click on **Select Multiple Items** so it appears unticked

3 Click on **All** then click on **[OK]** to see all of the data summed again

If you no longer require a filter you can remove the entire filter structure from the table...

4 Point to the **Age Grouping** field in the **FILTERS** area in the **PivotTable Fields** pane and drag the field listing out of the **FILTERS** area until a cross appears with your cursor then release the mouse button

Notice that the Age Grouping field label has also been removed from the worksheet



For Your Reference...

To **clear a report filter**:

1. Click on the drop arrow button at the right of the filter field in the table
2. Click on **All**
3. Click on **[OK]**

Handy to Know...

- To remove a field from the areas at the bottom of the **PivotTable Fields** pane, click on a field and drag it outside of the area. The name of the field will appear with your cursor and when a cross appears below the field name, release the mouse button and the field will be removed from the area.

SWITCHING PIVOTTABLE FIELDS

At any time, once you have created a PivotTable, you can modify the **ROWS** or **COLUMNS** and essentially ask a brand new question of the existing **PivotTable** report. When you add or

remove fields, the **PivotTable** will automatically analyse the data based on the new settings.

Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file *PivotTables_6.xlsx...*

1

In the **PivotTable Fields** pane point to **Salesperson** in the **ROWS** area, then click and drag the field outside of the **ROWS** area to remove it

Notice now how only the Column totals are left in the table...

2

In the **PivotTable Fields** pane, click and drag the **Payment Method** field to the **ROWS** area

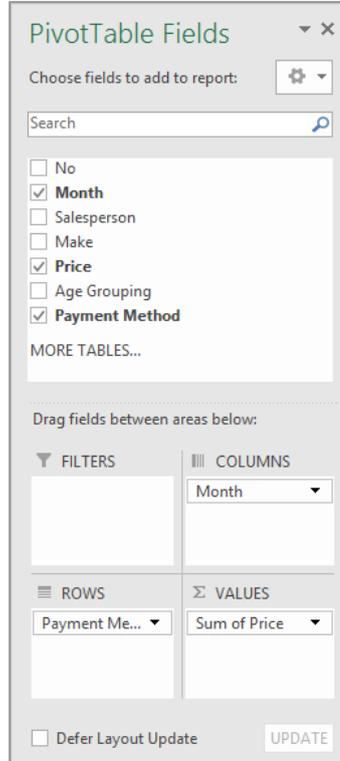
You should now see sales by Payment Method over the three months...

3

Repeat step 1 to remove the **Payment Method** field from the **ROWS** field, then click and drag the **Make** field to the **ROWS** area

You should now see the sales by Make of vehicle over the three months

2



3

	A	B	C	D	E	F	G
1							
2							
3	Sum of Price	Column Labels					
4	Row Labels	Jan	Feb	Mar	Grand Total		
5	BMW	43800	34499	142340	220639		
6	Ford	92361	12680	25220	130261		
7	GMH	12400	18900	22800	54100		
8	Hyundai	34500			34500		
9	KIA	12800	10500	19700	43000		
10	Mitsubishi	3500	8600	30700	42800		
11	Nissan		27600	100020	127620		
12	Peugot	12400	19900	8532	40832		
13	Renault	21090	30599	5600	57289		
14	Toyota	41855	22100	43489	107444		
15	Volkswagen	45700	17900	70122	133722		
16	Grand Total	320406	203278	468523	992207		
17							
18							

For Your Reference...

To **modify** the **structure** of a **PivotTable**:

1. Click on a field in either the **ROWS** or **COLUMNS** area
2. Click and drag it to a different location in the **PivotTable Fields** pane

Handy to Know...

- Wondering what **Defer Layout Update** on the **PivotTable Fields** pane does? If this option is ticked, changes made to the structure of the table aren't seen in the worksheet until **[Update]** is clicked. This can be used on large lists which may take a while to recalculate.

FORMATTING A PIVOTTABLE

PivotTables can be cryptic at the best of times, especially with the jargon and terminology used. The comprehension of a **PivotTable** is not always helped by the standard formatting applied

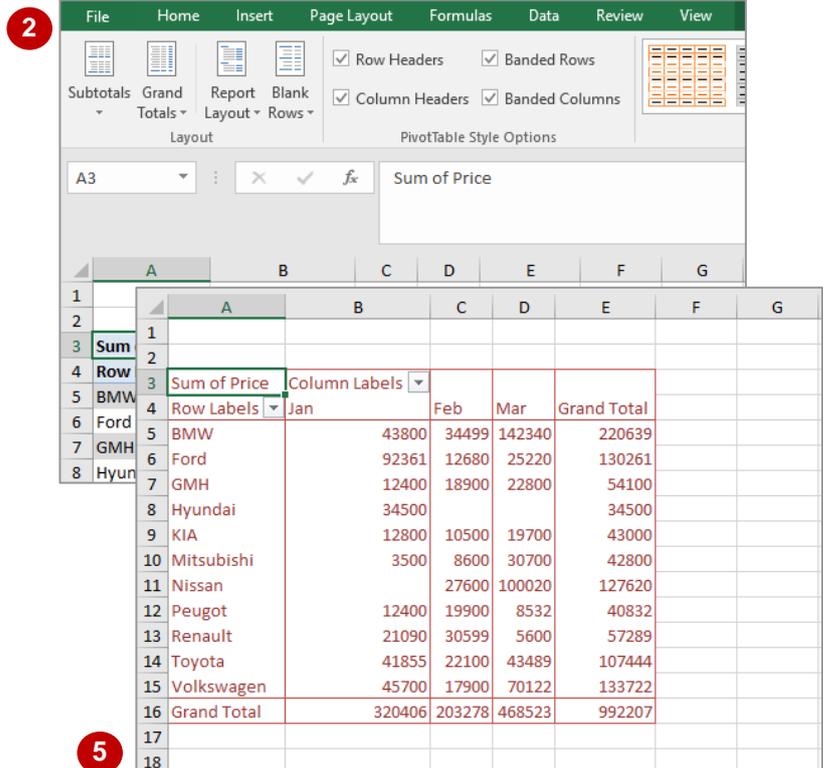
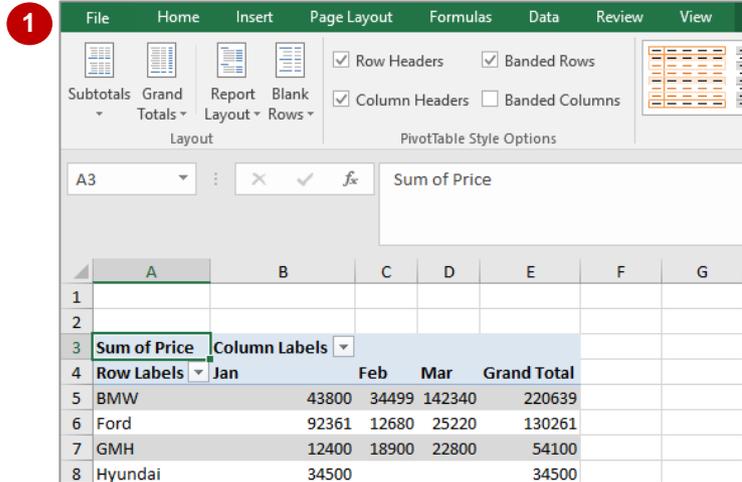
by Excel. Fortunately, using the options on the **PIVOTTABLE TOOLS: DESIGN** tab of the ribbon you can format a **PivotTable**, thus making the PivotTable easier to understandable.

Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file E1339 PivotTables_7.xlsx...

- 1 Click on the **PivotTable Tools: Design** tab, then click on **Banded Rows** in the **PivotTable Style Options** group so it appears ticked
Coloured bands will appear in the PivotTable...
- 2 Click on **Banded Columns** in the **PivotTable Style Options** group so it appears ticked to apply column bands in the **PivotTable**
- 3 Remove the tick from both **Banded Rows** and **Banded Columns** in the **PivotTable Style Options** group to remove the banding
- 4 Click on the **More** arrow for the **PivotTable Styles** gallery in the **PivotTable Styles** group, then point to the various options to view a Live Preview of the styles
- 5 Click on **Pivot Style Light 24** to apply it to the **PivotTable**



For Your Reference...

To **format** a **PivotTable**:

1. Click on the **PIVOTTABLE TOOLS: DESIGN** tab
2. Click on an option

Handy to Know...

- When formatting a PivotTable, you can use the standard formatting options for worksheets rather than apply a style from the **PivotTable Style** gallery.

UNDERSTANDING SLICERS

A **Slicer** is a very special filter that can be applied to a **PivotTable** listing. **Slicers** slice through your data providing instant cross-referencing views. Admittedly these cross-reference views can be

created by more traditional **PivotTable** filters, but the new **Slicers** make the task very easy indeed.

Slicer Buttons

When you create a **Slicer** for a **PivotTable** Excel will place a new graphics object on the worksheet. The object is just a rectangle with a series of filter buttons. There is a button for each unique example of data in the field you have chosen for your **Slicer**.

	A	B	C	D	E	F	G	H	I
1									
2									
3	Sum of Price	Column Labels							
4	Row Labels	Jan	Feb	Mar	Grand Total	Salesperson			
5	BMW	43800	34499	142340	220639	Hector Smith			
6	Ford	92361	12680	25220	130261	Justin Callaghan			
7	GMH	12400	18900	22800	54100	Mary O'Dwyer			
8	Hyundai	34500			34500				
9	KIA	12800	10500	19700	43000				
10	Mitsubishi	3500	8600	30700	42800				
11	Nissan		27600	100020	127620				
12	Peugot	12400	19900	8532	40832				
13	Renault	21090	30599	5600	57289				
14	Toyota	41855	22100	43489	107444				
15	Volkswagen	45700	17900	70122	133722				
16	Grand Total	320406	203278	468523	992207				
17									

A **Slicer** is a filter for one field of your table. In the example above a **Slicer** has been created for the **Salesperson** field. Since there are three sales people in the table a filter button is created for each salesperson. In the example above the filter button for *Hector Smith* has been clicked and Excel displays the monthly sales by make of vehicle for *Hector* in the **PivotTable** report.

What's really neat with **Slicers**, is that you can have more than one **Slicer** associated with your report as shown below.

	A	B	C	D	E	F	G	H	I	J	K	L
1												
2												
3	Sum of Price	Column Labels										
4	Row Labels	Jan	Feb	Mar	Grand Total	Month		Age Grouping				
5	BMW	43800	34499	142340	220639	Jan		25 or less				
6	Ford	92361	12680	25220	130261	Feb		26-35				
7	GMH	12400	18900	22800	54100	Mar		36-45				
8	Hyundai	34500			34500			46-55				
9	KIA	12800	10500	19700	43000			Over 55				
10	Mitsubishi	3500	8600	30700	42800							
11	Nissan		27600	100020	127620							
12	Peugot	12400	19900	8532	40832							
13	Renault	21090	30599	5600	57289							
14	Toyota	41855	22100	43489	107444							
15	Volkswagen	45700	17900	70122	133722							
16	Grand Total	320406	203278	468523	992207							
17												
18												
19												
20												
21												
22												

In the example above three **Slicers** have been created – one for **Salesperson**, one for **Type** (of vehicle), and another for **Year** (of vehicle manufacture). With this type of **Slicer** you could work out the total sales of 1999 coupes by Hector, or the total SUV sales by Justin, and the like.

CREATING SLICERS

Slicers are special field filters that can be applied to Excel tables. They are most useful for further dissecting an existing **PivotTable** report in a worksheet. **Slicers** are actually graphics objects

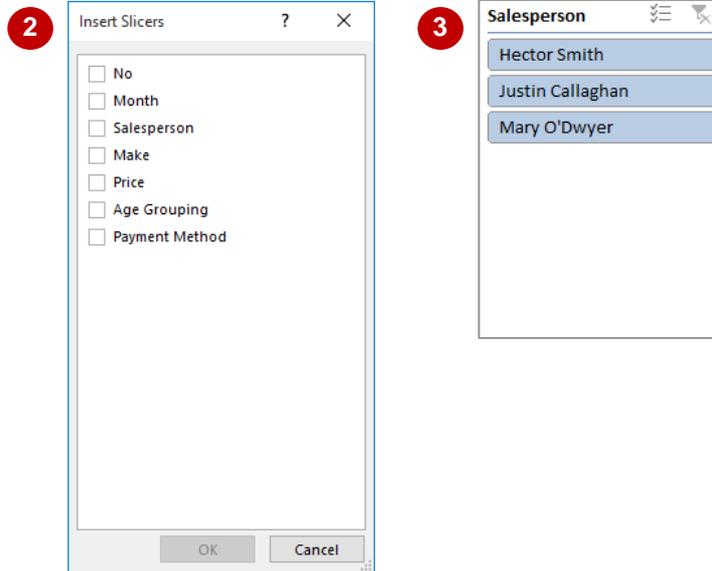
comprising of a rectangle and special filter buttons. **Slicers** are inserted into the worksheet from the **Slicer** command on the **INSERT** tab of the ribbon.

Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file *PivotTables_8.xlsx...*

- 1 Click anywhere in the **PivotTable** in the **Sheet2** worksheet
- 2 Click on the **Insert** tab, then click on **Slicer** in the **Filters** group to display the **Insert Slicers** dialog box
This box shows a tick box next to each of the fields from the data source...
- 3 Click on the tick box for **Salesperson** and click on **[OK]** to display a **Slicer** box with the salespeople in it
- 4 Click on **Hector Smith** to see only the sales made by **Hector Smith**
- 5 Click on **Mary O'Dwyer** to see only the sales made by **Mary O'Dwyer**
- 6 Click on **Clear Filter** in the **Slicer** box to see all of the sales again



	A	B	C	D	E	F	G	H	I
1									
2									
3	Sum of Price	Column Labels							
4	Row Labels	Jan	Feb	Mar	Grand Total				
5	BMW	11000	29419	33940	74359				
6	Ford	32100	2540	9000	43640				
7	GMH	12400		14500	26900				
8	Hyundai	18900			18900				
9	KIA	500	2000	19700	22200				
10	Mitsubishi		4300	5700	10000				
11	Nissan		9900	30300	40200				
12	Peugot			3999	3999				
13	Renault		10699		10699				
14	Toyota	34455	2500	6199	43154				
15	Volkswagen			36622	36622				
16	Grand Total	109355	61358	159960	330673				
17									

4

For Your Reference...

To **insert** a **slicer** into a **PivotTable**:

1. Click anywhere in the **PivotTable**
2. Click on the **INSERT** tab and click on **Slicer** in the **Filters** group
3. Tick the field(s) to slice and click on **[OK]**

Handy to Know...

- You can filter on more than one field. To do this click on the first sample, then hold down **Ctrl** and click on subsequent samples.

INSERTING A TIMELINE FILTER

Inserting a timeline for your PivotChart is a quick and easy way of filtering your data using the date field. A timeline allows you to quickly navigate data so that you can see data relating to specific

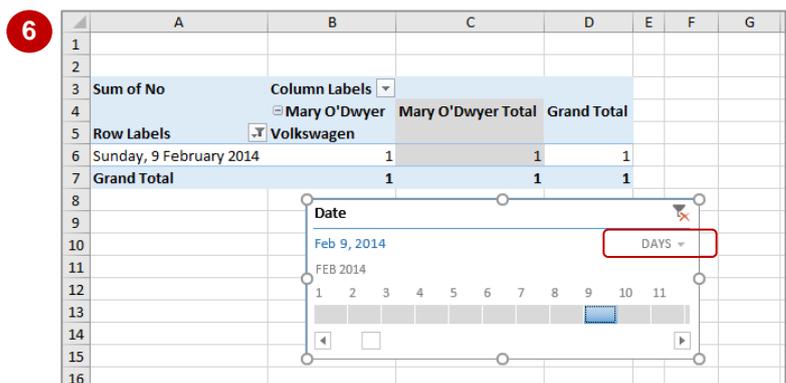
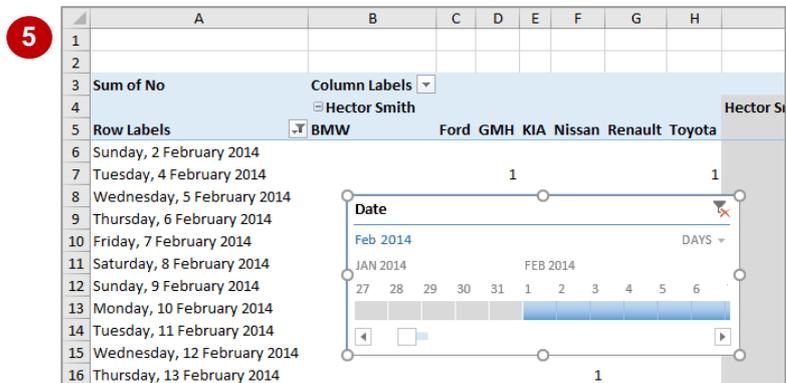
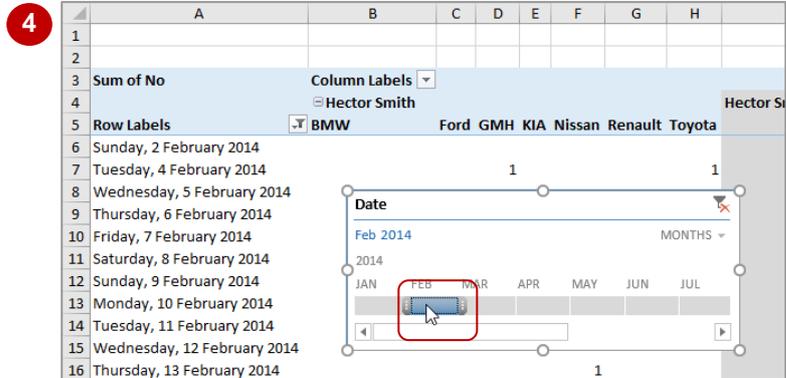
time periods. The timeline is separate to your PivotChart and can be moved around the screen as you desire.

Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file *PivotTables_9.xlsx...*

- 1 Click in the PivotTable, then click on the **PivotTable Tools: Analyze** tab
- 2 Click on **Insert Timeline** in the **Filter** group to display the **Insert Timeline** dialog box
- 3 Select **Date** so that it appears ticked, then click on **[OK]**
The date window will appear, displaying the timeline...
- 4 Click on the box below **Feb** to view only the sales for February in the PivotTable
- 5 Click on the drop arrow for **MONTHS**, then select **DAYS**
- 6 Scroll to the right to see the timeline section for **FEB 2014**, then click on the box below **9** to only view the sales for **Sunday 9 Feb 2014**
- 7 Press **[Alt] + [C]** to clear the filter and view all the data again



For Your Reference...

To **insert** a **timeline filter**:

1. Click on the **PivotTable Tools: Analyze** tab, then click on **Insert Timeline** in the **Filter** group
2. Click on various section of the timeline to view the data for that specific time period

Handy to Know...

- When you insert a timeline the contextual tab, **Timeline Tools: Options** will appear. You can use this tab to customise the appearance of the **Date** window.
- To remove the timeline, simply click on the window to select it and press **[Del]**.

PivotTables provide a very easy and convenient way of analysing data in lists and external databases. Once you have mastered the basics of how they work and how they are created, you are ready to begin a journey into some of the more intricate and advanced aspects of PivotTable design, operation, and even formatting.

In this session you will:

- ✓ learn how to use compound field variables in a **PivotTable**
- ✓ learn how to count the values in a **PivotTable** and perform other summary operations
- ✓ learn how to format the values in a **PivotTable**
- ✓ learn how to hide and show grand totals in a **PivotTable**
- ✓ learn how to switch **PivotTable** report subtotals on and off
- ✓ learn how to show a percentage of total in a **PivotTable**
- ✓ learn how to find the difference between specific values in a **PivotTable**
- ✓ learn how to group fields in a **PivotTable**
- ✓ learn how to create a running total in a **PivotTable**
- ✓ learn how to create calculated fields in a **PivotTable**
- ✓ learn how to create custom names for **PivotTable** fields
- ✓ learn how to create calculated items in a **PivotTable**
- ✓ learn how to make changes to **PivotTable** options
- ✓ learn how to sort values in a **PivotTable**.

USING COMPOUND FIELDS

Simple PivotTables use only one field for **Column Labels** or **Row Labels**. In an Excel PivotTable you can use more than one field for either the **Column Labels** or **Row Labels** to

create more complex analysis of the data. Once you have chosen a second field for analysis that field in effect becomes a **sub-group** of the field above it in the area.

Try This Yourself:

Open File

Before starting this exercise you **MUST** open the file *PivotTable Features_1.xlsx...*

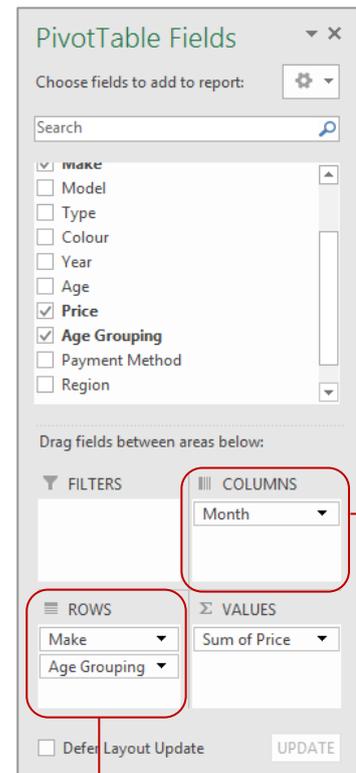
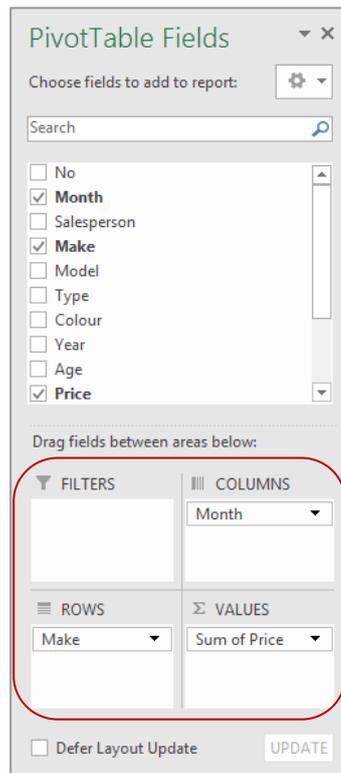
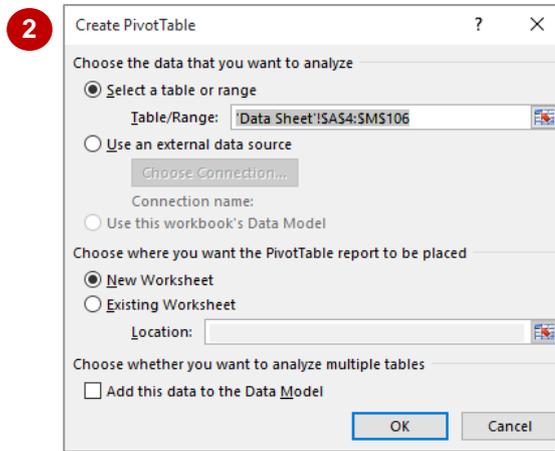
- 1 Click anywhere in the list of car sales
- 2 Click on the **Insert** tab, then click on **PivotTable** in the **Tables** group to display the **Create PivotTable** dialog box
- 3 Ensure that **Select a table or range** and **New Worksheet** are both selected, then click on **[OK]** to create a PivotTable

Notice the **PivotTable Fields** pane displays automatically...

- 4 In the **PivotTable Fields** pane, click on and drag the **Month**, **Make** and **Price** fields into the **COLUMNS**, **ROWS** and **VALUES** areas, as shown
- 5 Repeat step 4 to position the **Age Grouping** field below **Make** in the **ROWS** area

This will create an **Age Grouping** sub-total for each vehicle **Make** in the table...

- 6 Repeat step 4 to position the **Type** field below **Month** in the **COLUMNS** area to see monthly sales by **Make** and **Age Grouping** for vehicle **Types**



For Your Reference...

To **use compound fields**:

1. Construct a PivotTable and insert fields in the normal way
2. In the **PivotTable Fields** pane, click on and drag additional fields to the areas under **Drag fields between areas below**

Handy to Know...

- You can change how the fields are displayed in the **PivotTable Fields** pane by clicking on **Tools** and selecting an option. For instance, if you select **Fields Section and Areas Section Side-By-Side**, the pane will display the areas section to the right of the fields list rather than below it.

COUNTING IN A PIVOTTABLE

As a default Excel assumes that you will be using your PivotTable report to **summarise** (total) data from your list. However, you can actually choose from a number of different analytical operations

to perform on the data in a PivotTable. Apart from summing data, another often-used operation is to **count** the data.

Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file *PivotTable Features_2.xlsx...*

- 1 In the PivotTable, click in cell **A3** (the **Sum of Price** heading)
- 2 On the **PivotTable Tools: Analyse** tab, click on **Field Settings** in the **Active Field** group
The Value Field Settings dialog box will display...
- 3 Click on **Count**, then click on **[OK]** to see a count of the values rather than a summation
- 4 Right-click in cell **A3**, point to **Summarise Values By**, then select **Average** to see average sales
- 5 Point to cell **C6** to see a description of the cell calculation
- 6 Repeat step 4 and try some other options
- 7 Right-click on cell **A3** and select **Summarise Values By > Sum** to see total sales again

1

	A	B	C	D	E	F	G	H
1								
2								
3	Sum of Price	Column Labels						
4		Jan			Jan Total	Feb		
5	Row Labels	Coupe	Sedan	SUV	Wagon		Coupe	Sedan
6	BMW	23400	20400			43800	6539	9160
7	26-35		4500			4500	2540	2540
8	36-45	11000				11000	3999	
9	46-55		15900			15900		
10	Over 55	12400				12400		
11	Under 25							6620
12	Ford	47100	2050	43211		92361	2540	5940

2

Value Field Settings

Source Name: Price

Custom Name: Sum of Price

Summarize Values By: Show Values As

Summarize value field by

Choose the type of calculation that you want to use to summarize data from the selected field

- Sum
- Count
- Average
- Max
- Min
- Product

Number Format OK Cancel

4

	A	B	C	D	E	F
1						
2						
3	Average of Price	Column Labels				
4		Jan			Jan Total	
5	Row Labels	Coupe	Sedan	SUV	Wagon	
6	BMW	11700	10200			10950
7	26-35		4500			4500
8	36-45	11000				11000
9	46-55		15900			15900
10	Over 55	12400				12400
11	Under 25					12400
12	Ford	23550	2050	43211		23090.25

For Your Reference...

To **change** the **summation operation**:

1. Select the summation values cell
2. Click on the **PivotTable Tools: Analyse** tab, then click on **Field Settings** in the **Active Field** group
3. Click on the desired **Summarise Value** and click on **[OK]**

Handy to Know...

- You can display the **Value Field Settings** dialog box by right-clicking on a value in a PivotTable pointing to **Summarise Values By**, then selecting **More Options**.

FORMATTING PIVOTTABLE VALUES

Unless you specify otherwise, the calculated values in a PivotTable will appear unformatted. This may be satisfactory while performing analysis, however, should you wish to print the

data for others to see it would be far better if the values could be formatted so they are readable, presentable and understandable.

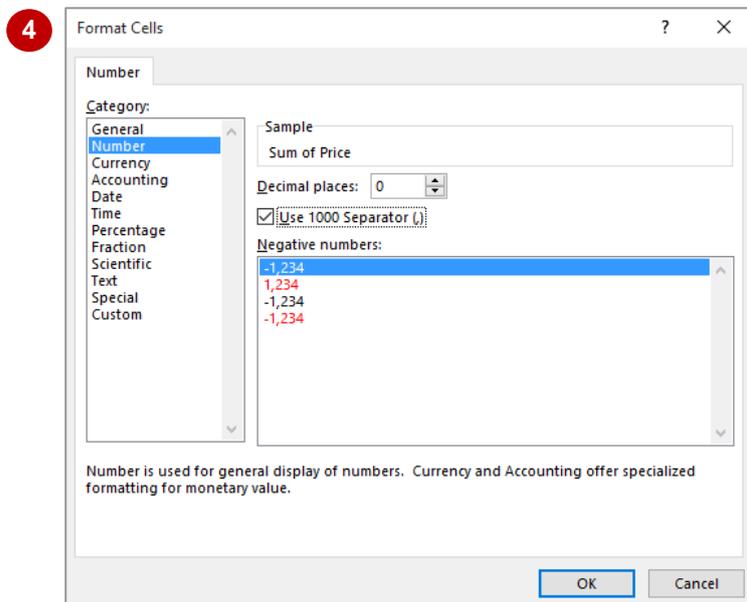
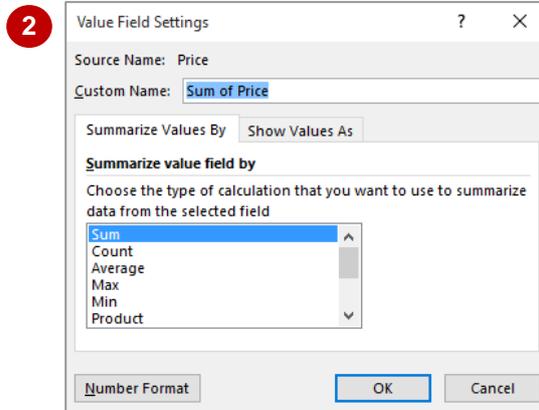
Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file *PivotTable Features_3.xlsx...*

- 1 In the PivotTable, click in cell **A3** (the **Sum of Price** heading)
- 2 On the **PivotTable Tools: Analyse** tab, click on **Field Settings** in the **Active Field** group to display the **Value Field Settings** dialog box
- 3 Click on **[Number Format]** in the bottom left corner of the dialog box to display the **Format Cells** dialog box
- 4 Click on **Number** under **Category**, then adjust the settings as shown
- 5 Click on **[OK]** twice to return to the formatted data

Notice that commas have been inserted in the numbers where appropriate...



	A	B	C	D	E	F	G	H
1								
2								
3	Sum of Price	Column Labels						
4		Jan				Jan Total	Feb	
5	Row Labels	Coupe	Sedan	SUV	Wagon		Coupe	Sedan
6	BMW	23,400	20,400			43,800	6,539	9,164
7	26-35		4,500			4,500	2,540	2,540
8	36-45	11,000				11,000	3,999	
9	46-55		15,900			15,900		

For Your Reference...

To **format values** in a **PivotTable report**:

1. Click on the values cells, click on the **PivotTable Tools: Analyse** tab, then click on **Field Settings** in the **Active Field** group
2. Click on **[Number Format]**, Choose the desired format, then click on **[OK]**

Handy to Know...

- Each time the PivotTable is recalculated, the number formats are set to those shown in the **Field Settings** command.

WORKING WITH PIVOTTABLE GRAND TOTALS

As a default, Excel's PivotTable reports will appear with **grand totals** at the end of the rows and at the end of the columns. These can be switched off and on as required. There may be

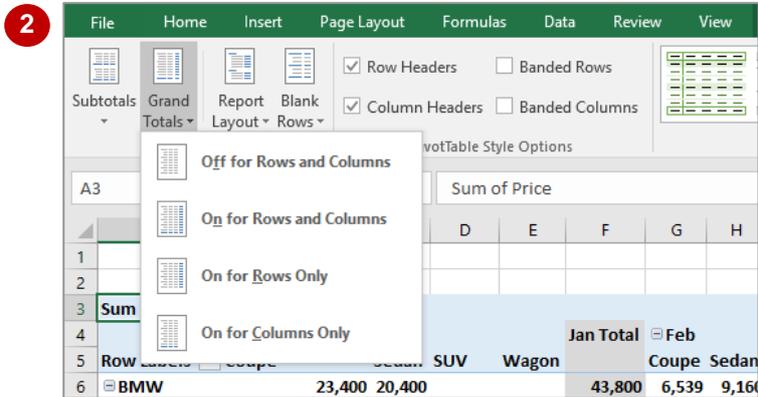
times, for example, when you are interested only in the data values themselves and not in the grand totals.

Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file *PivotTable Features_4.xlsx...*

- 1 Click anywhere in the PivotTable
- 2 Click on the **PivotTable Tools: Design** tab, then click on **Grand Totals** in the **Layout** group to display a list of options
- 3 Select **Off for Rows and Columns** to turn the grand totals off for rows and columns
- 4 Repeat steps 2 and 3 to select **On for Rows Only** to display the grand totals for rows only
- 5 Repeat step 2 and 3 to hide the grand totals again



The screenshot shows a PivotTable with columns K through S. Row 4 is the grand total row, showing Feb Total, Mar, Mar Total, and Grand Total. Row 5 is the grand total column, showing Coupe, Sedan, SUV, and Wagon. The data values are as follows:

	Feb Total	Mar	Mar Total	Grand Total
	Coupe	Sedan	SUV	Wagon
6	34,499	5,900	66,140	70,300
7	5,080		6,590	70,300
8	3,999		7,300	7,300
9	15,400	5,900	36,850	42,750
10			15,400	15,400
11	10,020			10,020
12	12,680	9,900	12,120	3,200
13				25,220
14	2,540	5,600	7,900	3,200
				16,700
				220,639
				86,470
				22,299
				74,050
				27,800
				32,100
				34,240

The screenshot shows the same PivotTable as above, but with the grand totals for columns hidden. The Grand Total column is no longer visible.

For Your Reference...

To **remove** the **grand totals** from a **PivotTable**:

1. Click on the **PivotTable Tools: Design** tab
2. Click on **Grand Totals** in the **Layout** group
3. Select the desired option

Handy to Know...

- You can show and hide **Grand Totals** by clicking on the **PivotTable Tools: Analyze** tab and clicking on **Options** in the **PivotTable** group to display the **PivotTable Options** dialog box. Using the **Totals & Filters** tab, you can then switch the grand totals on or off.

WORKING WITH PIVOTTABLE SUBTOTALS

When you add fields to the **Column Labels** or **Row Labels** area of the **PivotTable Fields** pane, Excel assumes that you also wish to **subtotal** the values for these fields. As a result, **subtotals** will

appear at the end of each field value, both column and row, in the PivotTable. These can be switched off if not required.

Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file *PivotTable Features_5.xlsx...*

- 1 In the PivotTable click in cell **B4 (Jan)**
- 2 Click on the **PivotTable Tools: Analyse** tab, then click on **Field Settings** in the **Active Field** group to display the **Field Settings** dialog box
- 3 Ensure the **Subtotals & Filters** tab is selected, then click on **None** in **Subtotals** to select this option
- 4 Click on **[OK]** to remove the monthly subtotals and close the dialog box
- 5 Click in cell **A6 (BMW)**
- 6 Repeat steps 2 and 3 to remove the subtotals for **Make**

1

	A	B	C	D	E	F	G	H
1								
2								
3	Sum of Price	Column Labels						
4		Jan				Jan Total	Feb	
5	Row Labels	Coupe	Sedan	SUV	Wagon		Coupe	Sedan
6	BMW	23,400	20,400			43,800	6,539	9,160
7	26-35		4,500			4,500	2,540	2,540
8	36-45	11,000				11,000	3,999	
9	46-55		15,900			15,900		
10	Over 55	12,400				12,400		
11	Under 25							6,620
12	Ford	47,100	2,050	43,211		92,361	2,540	5,940

4

	A	B	C	D	E	F	G	H
1								
2								
3	Sum of Price	Column Labels						
4		Jan				Feb		
5	Row Labels	Coupe	Sedan	SUV	Wagon	Coupe	Sedan	SUV
6	BMW	23,400	20,400			6,539	9,160	18,800
7	26-35		4,500			2,540	2,540	
8	36-45	11,000				3,999		
9	46-55		15,900					15,400
10	Over 55	12,400						
11	Under 25						6,620	3,400
12	Ford	47,100	2,050	43,211		2,540	5,940	

6

	A	B	C	D	E	F	G	H
1								
2								
3	Sum of Price	Column Labels						
4		Jan				Feb		
5	Row Labels	Coupe	Sedan	SUV	Wagon	Coupe	Sedan	SUV
6	BMW							
7	26-35		4,500			2,540	2,540	
8	36-45	11,000				3,999		
9	46-55		15,900					15,400
10	Over 55	12,400						
11	Under 25						6,620	3,400
12	Ford							

For Your Reference...

To **show** or **hide subtotals** in a **PivotTable**:

1. Click in the first row or column value cell
2. Click on the **PivotTable Tools: Analyse** tab, then click on **Field Settings** in the **Active Field** group
3. Click on the **Subtotals & Filters** tab, click on **None** in **Subtotals**, then click on **[OK]**

Handy to Know...

- You can turn off all subtotals in a PivotTable simultaneously by clicking on the **PivotTable Tools: Design** tab, clicking on **Subtotals** in the **Layout** group and selecting **Do Not Show Subtotals**.

FINDING THE PERCENTAGE OF TOTAL

PivotTables provide their analysis results as tables. During the process, grand totals and subtotals are calculated and presented. To assist in further analysis of the data it is possible to

have the PivotTable report calculate the **percentage** of each value against the row total, the column total, and even the grand total. This is handy for comparative purposes.

Try This Yourself:

Open File

Before starting this exercise you **MUST** open the file *PivotTable Features_6.xlsx...*

- 1 Click in cell **B5** to activate the PivotTable then click on the **PivotTable Tools: Analyze** tab
- 2 Click on **Field Settings** in the **Active Field** group to display the **Field Settings** dialog box, then click on the **Show Values As** tab
- 3 Click on the drop arrow for **Show values as**, then select **% of Row Total**
- 4 Click on **[OK]** to see each month represented as a percentage of the total
- 5 Repeat step 2 to display the **Show Values As** tab in the **Field Settings** dialog box
- 6 Click on the drop arrow for **Show values as**, select **% of Column Total**, then click on **[OK]**

1

	A	B	C	D	E
1					
2					
3	Sum of Price	Column Labels			
4	Row Labels	Jan	Feb	Mar	Grand Total
5	BMW	43,800	34,499	142,340	220,639
6	Ford	92,361	12,680	25,220	130,261
7	GMH	12,400	18,900	22,800	54,100
8	Hyundai	34,500			34,500
9	KIA	12,800	10,500	19,700	43,000
10	Mitsubishi	3,500	8,600	30,700	42,800
11	Nissan		27,600	100,020	127,620

3

Value Field Settings

Source Name: Price

Custom Name: Sum of Price

Summarize Values By: Show Values As

Show values as: % of Row Total

Base field: No, Month, Salesperson, Make, Model, Type

Base item:

Number Format, OK, Cancel

6

	A	B	C	D	E	F	G	H
1								
2								
3	Sum of Price	Column Labels						
4	Row Labels	Jan	Feb	Mar	Grand Total			
5	BMW	13.67%	16.97%	30.38%	22.24%			
6	Ford	28.83%	6.24%	5.38%	13.13%			
7	GMH	3.87%	9.30%	4.87%	5.45%			
8	Hyundai	10.77%	0.00%	0.00%	3.48%			
9	KIA	3.99%	5.17%	4.20%	4.33%			
10	Mitsubishi	1.09%	4.23%	6.55%	4.31%			
11	Nissan	0.00%	13.58%	21.35%	12.86%			

For Your Reference...

To **find** the **percentage of total**:

1. Click in a data value cell
2. Click on the **PivotTable Tools: Analyze** tab, then click on **Field Settings** in the **Active Field** group
3. Click on the **Show Values As** tab, click on **% of row** or **% of column**, then click on **[OK]**

Handy to Know...

- You can select to show a set of values as a percentage by right-clicking on a value in the PivotTable and pointing to **Show Values As** to display a list of options. Select an option to apply it to the set of values.

FINDING THE DIFFERENCE FROM

If you need to compare field values from columns in a table you can use the **Difference From** option. In our case study we have three months of data. Using *Jan* as the base month, we can

use the **Difference From** option to compare the values for the months of *Feb* and *Mar* against the values of *Jan*.

Try This Yourself:

Open File

Before starting this exercise you **MUST** open the file *PivotTable Features_7.xlsx...*

- 1 Click in cell **B5** to activate the PivotTable, then click on the **PivotTable Tools: Analyze** tab
- 2 Click on **Field Settings** in the **Active Field** group to display the **Field Settings** dialog box, then click on the **Show Values As** tab
- 3 Click on the drop arrow for **Show values as**, then scroll down to and click on **Difference From**
- 4 Click on **Month** in **Base field** and ensure **Jan** is selected in **Base item**

The Base field is the field used to compare all other values to, while Jan is the "base item" in the base field against which comparisons are made...
- 5 Click on **[OK]** to see how the values in **Feb** and **Mar** differ from the corresponding base values in **Jan**

1

	A	B	C	D	E
1					
2					
3	Sum of Price	Column Labels			
4	Row Labels	Jan	Feb	Mar	Grand Total
5	BMW	43,800			
6	Ford	92,361			
7	GMH	12,400			
8	Hyundai	34,500			
9	KIA	12,800			
10	Mitsubishi	3,500			
11	Nissan		27,600	100,020	127,620

4

Value Field Settings

Source Name: Price

Custom Name: Sum of Price

Summarize Values By: Show Values As

Show values as: Difference From

Base field: Month

Base item: Jan

Number Format: OK Cancel

5

	A	B	C	D	E	F	G	H
1								
2								
3	Sum of Price	Column Labels						
4	Row Labels	Jan	Feb	Mar	Grand Total			
5	BMW		-9,301	98,540				
6	Ford		-79,681	-67,141				
7	GMH		6,500	10,400				
8	Hyundai		-34,500	-34,500				
9	KIA		-2,300	6,900				
10	Mitsubishi		5,100	27,200				
11	Nissan		27,600	100,020				

For Your Reference...

To **find** the **difference from**:

1. Click in a data value cell, then click on **PivotTable Tools: Analyze > Field Settings**
2. Click on the **Show Values As** tab, then click on **Difference From**, specify the **Base field** and **Base item**, then click on **[OK]**

Handy to Know...

- Using the **Show Values As** tab in the **Value Field Settings** dialog box you can select **% Difference From** which, as the name suggests, shows the *difference from* a base item but expressed as a percentage rather than as a value.

GROUPING IN PIVOTTABLE REPORTS

Sometimes the results of a PivotTable still aren't enough to provide a comprehensive analysis of the data. Further analysis of the data can be completed by grouping within a PivotTable. A

typical use for grouping occurs when dates have been used as one of the PivotTable variables. These dates can be further grouped into months to provide a better analysis of the data.

Try This Yourself:

Open File

Before starting this exercise you **MUST** open the file *PivotTable Features_8.xlsx...*

This PivotTable report is derived from a list of petty cash transactions found in the *Petty Cash Receipts* worksheet. The table sums the transactions by Date (rows) and Description (columns)...

- 1 Click in cell **A5** – this is the first cell with a date in it
- 2 On the **PivotTable Tools: Analyze** tab, click on **Group Selection** in the **Group** group to display the **Grouping** dialog box
- 3 Ensure that **Months** is selected in **By**
- 4 Click on **[OK]** to group the table according to months, based on the dates in the first column

1

	A	B	C	D	E	F
1						
2						
3	Sum of Amount	Column Labels				
4	Row Labels	Entertainment	Kitchen Supplies	Postage	Stationery	Grand Total
5	8/02/2008		34.50			34.50
6	11/02/2008			4.50		4.50
7	14/02/2008	55.99				55.99
8	17/02/2008				22.50	22.50
9	20/02/2008				17.50	17.50
10	23/02/2008	76.00				76.00
11	26/02/2008		32.98			32.98

3

Grouping ? X

Auto

Starting at: 8/02/2008

Ending at: 29/07/2008

By

- Seconds
- Minutes
- Hours
- Days
- Months
- Quarters
- Years

Number of days: 1

OK Cancel

4

	A	B	C	D	E	F
1						
2						
3	Sum of Amount	Column Labels				
4	Row Labels	Entertainment	Kitchen Supplies	Postage	Stationery	Grand Total
5	Feb	131.99	67.48	10.20	40.00	249.67
6	Mar	171.25	37.20	28.43	39.30	276.18
7	Apr	59.80	74.25	32.05	12.90	179.00
8	May	101.30	49.40	23.70	38.40	212.80
9	Jun	114.90	118.80	21.50	25.31	280.51
10	Jul	67.50	23.40	38.50	66.10	195.50
11	Grand Total	646.74	370.53	154.38	222.01	1,393.66
12						

For Your Reference...

To **group a field** in a **PivotTable report**:

1. Click on the field to group
2. On the **PivotTable Tools: Analyze** tab click on **Group Selection** in the **Group** group
3. Select an option in **By** and click on **[OK]**

Handy to Know...

- Not all fields in a PivotTable report can be grouped. The **Group Selection** command will be greyed out when a selected field can't be used for grouping.

CREATING RUNNING TOTALS

A really useful analysis tool within PivotTable reports is the ability to create **running totals** from the PivotTable data. As the name suggests, running totals are cumulatively summed together

and provide a path as to how the grand total is ultimately derived.

Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file *PivotTable Features_9.xlsx...*

- 1 Click in cell **B5** – the first value cell for the **Entertainment** field
- 2 Click on the **PivotTable Tools: Analyse** tab, then click on **Field Settings** in the **Active Field** group to display the **Value Field Settings** dialog box
- 3 Click on the **Show Values As** tab, then click on the drop arrow for **Show values as** and select **Running Total In**
- 4 Ensure that **Date** is selected in **Base field**, then click on **[OK]**

Notice how each value is now cumulatively summed until the value for Jul is equal to what the previous grand total showed

1

	A	B	C	D	E	F
1						
2						
3	Sum of Amount	Column Labels				
4	Row Labels	Entertainment	Kitchen Supplies	Postage	Stationery	Grand Total
5	Feb	131.99	67.48	10.20	40.00	249.67
6	Mar	171.25	37.20	28.43	39.30	276.18
7	Apr	59.80	74.25	32.05	12.90	179.00
8	May	101.30	49.40	23.70	38.40	212.80
9	Jun	114.90	118.80	21.50	25.31	280.51
10	Jul	67.50	23.40	38.50	66.10	195.50
11	Grand Total	646.74	370.53	154.38	222.01	1,393.66
12						

3

Value Field Settings

Source Name: Amount

Custom Name: Sum of Amount

Summarize Values By: Show Values As

Show values as: Running Total In

Base field: Date

Base item:

Number Format

OK Cancel

4

	A	B	C	D	E	F
1						
2						
3	Sum of Amount	Column Labels				
4	Row Labels	Entertainment	Kitchen Supplies	Postage	Stationery	Grand Total
5	Feb	131.99	67.48	10.20	40.00	249.67
6	Mar	303.24	104.68	38.63	79.30	525.85
7	Apr	363.04	178.93	70.68	92.20	704.85
8	May	464.34	228.33	94.38	130.60	917.65
9	Jun	579.24	347.13	115.88	155.91	1,198.16
10	Jul	646.74	370.53	154.38	222.01	1,393.66
11	Grand Total					
12						

For Your Reference...

To **create running totals** in a **PivotTable**:

1. Click on the first value field to select it
2. Click on **PivotTable Tools: Analyse > Field Settings** in the **Active Field** group
3. Click on the **Show Values As** tab and select **Running Total In**, specify the **Base field**, then click on **[OK]**

Handy to Know...

- If your PivotTable contains a grand total row and you then apply a running total, the grand total row will no longer display any values. In order to avoid confusing those viewing your PivotTable, it is recommended that you hide the grand total row.

CREATING CALCULATED FIELDS

The fields that appear in a PivotTable are normally the column headings in the data list. However, you can create **calculated fields** which are *derived* from the column headings in the data

list. For example, if you have a field called *Sales*, and you know that tax is always 10% of *Sales*, you can create a new field called *Sales Tax* which calculates values based on the *Sales* field.

Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file *PivotTable Features_10.xlsx...*

- 1 Click in cell **A5 (Feb)**, then click on the **PivotTable Tools: Analyse** tab
- 2 Click on **Fields, Items & Sets** in the **Calculations** group and select **Calculated Field** to display the **Insert Calculated Field** dialog box
- 3 Type **Tax** in **Name**
- 4 Press **[Tab]** to select the value in **Formula** and type **=Amount*0.1**
This tells Excel to create a new calculated field that takes the value currently in the Amount field and multiply it by 0.1 (10%)...
- 5 Click on **[OK]**

1

	A	B	C	D	E	F
1						
2						
3	Sum of Amount	Column Labels				
4	Row Labels	Entertainment	Kitchen Supplies	Postage	Stationery	Grand Total
5	Feb	131.99	67.48	10.20	40.00	249.67
6	Mar	303.24	104.68	38.63	79.30	525.85
7	Apr	363.04	178.93	70.68	92.20	704.85
8	May	464.34	228.33	94.38	130.60	917.65
9	Jun	579.24	347.13	115.88	155.91	1,198.16
10	Jul	646.74	370.53	154.38	222.01	1,393.66
11	Grand Total					
12						

4

Insert Calculated Field

Name: Tax Add

Formula: =Amount*0.1 Delete

Fields:

- Date
- Description
- Amount

Insert Field

OK Close

5

	A	B	C	D	E	F
1						
2						
3		Column Labels				
4		Entertainment	Kitchen Supplies	Postage		
5	Row Labels	Sum of Amount	Sum of Tax	Sum of Amount	Sum of Tax	Sum of Am
6	Feb	131.99	13.20	67.48	6.75	
7	Mar	303.24	17.13	104.68	3.72	
8	Apr	363.04	5.98	178.93	7.43	
9	May	464.34	10.13	228.33	4.94	
10	Jun	579.24	11.49	347.13	11.88	1
11	Jul	646.74	6.75	370.53	2.34	1
12	Grand Total		64.67		37.05	
13						

For Your Reference...

To create a **calculated field**:

1. On the **PivotTable Tools: Analyse** tab click on **Fields, Items & Sets** in the **Calculations** group, then select **Calculated Field**
2. Type a **Name** for the field and the **Formula** then click on **[OK]**

Handy to Know...

- To edit or delete a calculated field after it has been created, simply use **Fields, Items & Sets > Calculated Field** to display the dialog box again. Choose the calculated field that you want to change from the drop arrow and either make the changes or click on **[Delete]** to delete the field.

PROVIDING CUSTOM NAMES

When PivotTables are created they use default names for their calculated fields and values. As a result you end up with descriptive, but not very elegant, names such as *Sum of Amount*.

Fortunately you can customise these names so that they are more in tune with your requirements and possibly make more sense to those viewing your workbook.

Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file *PivotTable Features_11.xlsx...*

- 1 Click in cell **B5** (**Sum of Amount**), then click on the **PivotTable Tools: Analyze** tab
- 2 Click on **Field Settings** in the **Active Field** group to display the **Value Field Settings** dialog box
- 3 Type **Total** in **Custom Name**, then click on [OK] to rename all **Sum of Amount** columns to **Total**
- 4 Click in cell **C5** (**Sum of Tax**)
- 5 Click on **Field Settings** in the **Active Field** group
- 6 Type **Sales Tax** in **Custom Name**, then click on [OK]

1

	A	B	C	D	E	F
1						
2						
3		Column Labels				
4		Entertainment	Kitchen Supplies		Postage	
5	Row Labels	Sum of Amount	Sum of Tax	Sum of Amount	Sum of Tax	Sum of Am
6	Feb	131.99	13.20	67.48	6.75	
7	Mar	303.24	17.13	104.68	3.72	
8	Apr	363.04	5.98	178.93	7.43	
9	May	464.34	10.13	228.33	4.94	
10	Jun	579.24	11.49	347.13	11.88	1
11	Jul	646.74	6.75	370.53	2.34	1
12	Grand Total		64.67		37.05	
13						

3

	A	B	C	D	E	F
1						
2						
3		Column Labels				
4		Entertainment	Kitchen Supplies		Postage	
5	Row Labels	Total	Sum of Tax	Total	Sum of Tax	Total
6	Feb	131.99	13.20	67.48	6.75	10.20
7	Mar	303.24	17.13	104.68	3.72	38.63
8	Apr	363.04	5.98	178.93	7.43	70.68
9	May	464.34	10.13	228.33	4.94	94.38
10	Jun	579.24	11.49	347.13	11.88	115.88
11	Jul	646.74	6.75	370.53	2.34	154.38
12	Grand Total		64.67		37.05	
13						

6

	A	B	C	D	E	F	G
1							
2							
3		Column Labels					
4		Entertainment	Kitchen Supplies		Postage		
5	Row Labels	Total	Sales Tax	Total	Sales Tax	Total	Sales
6	Feb	131.99	13.20	67.48	6.75	10.20	
7	Mar	303.24	17.13	104.68	3.72	38.63	
8	Apr	363.04	5.98	178.93	7.43	70.68	
9	May	464.34	10.13	228.33	4.94	94.38	
10	Jun	579.24	11.49	347.13	11.88	115.88	
11	Jul	646.74	6.75	370.53	2.34	154.38	
12	Grand Total		64.67		37.05		1
13							

For Your Reference...

To **create** a **custom field name**:

1. Click in the field to change
2. Click on the **PivotTable Tools: Analyze** tab, then click on **Field Settings** in the **Active Field** group
3. Type a new name in **Custom Name** and click on [OK]

Handy to Know...

- You cannot use a custom name that is the same as the name of an existing field – duplicate names are not permitted by PivotTable reports.

CREATING CALCULATED ITEMS

When a field is used as a variable in a PivotTable the resultant groupings are known as **items**. For example, if you have a field called *Months*, the values stored in that field (*Jan*, *Feb*, etc.) are

items of that field. In PivotTables you can actually create **calculated items** based on existing items in a field. For example, you could add two months together, or subtract them from one another, etc.

Try This Yourself:

Open File

Before starting this exercise you **MUST** open the file *PivotTable Features_12.xlsx...*

- 1 Click in cell **B4 (Jan)**, then click on the **PivotTable Tools: Analyse** tab
- 2 Click on **Fields, Items & Sets** in the **Calculations** group and select **Calculated Item** to display the **Insert Calculated Item** dialog box
- 3 Type **Variation** in **Name**
- 4 Press **Tab** to move to **Formula**, then type **=Feb-Jan**
- 5 Click on **[OK]** to create the calculated item
- 6 Point above the heading **Variation** in cell **E4** until the pointer changes to a black arrow, then click once to select the column (or item)
- 7 Point to the border of the selected area so that the pointer changes to a four-headed arrow, click and drag the **Variation** column left to position it between **Feb** and **Mar**, then release the mouse button

1

	A	B	C	D	E
1					
2					
3	Sum of Price	Column Labels			
4	Row Labels	Jan	Feb	Mar	Grand Total
5	BMW	43,800		34,499	142,340
6	Ford	92,361		12,680	25,220
7	GMH	12,400		18,900	22,800
8	Hyundai	34,500			34,500
9	KIA	12,800		10,500	19,700
10	Mitsubishi	3,500		8,600	30,700
11	Nissan			27,600	100,020
					127,620

4

Insert Calculated Item in "Month" ? X

Name: Variation Add

Formula: =Feb-Jan Delete

Fields:

- No
- Month
- Salesperson
- Make
- Model
- Type
- Colour
- Year

Items:

- Jan
- Feb
- Mar

Insert Field Insert Item

OK Close

7

	A	B	C	D	E	F	G	H
1								
2								
3	Sum of Price	Column Labels						
4	Row Labels	Jan	Feb	Variation	Mar	Grand Total		
5	BMW	43,800	34,499	-9,301	142,340	211,338		
6	Ford	92,361	12,680	-79,681	25,220	50,580		
7	GMH	12,400	18,900	6,500	22,800	60,600		
8	Hyundai	34,500		-34,500		0		
9	KIA	12,800	10,500	-2,300	19,700	40,700		
10	Mitsubishi	3,500	8,600	5,100	30,700	47,900		
11	Nissan		27,600	27,600	100,020	155,220		

For Your Reference...

To create a **calculated item**:

1. Click in the table, click on the **PivotTable Tools: Analyse** tab, then click on **Fields, Items & Sets** in the **Calculations** group
2. Select **Calculated Item**, type a **Name** and a **Formula**, then click on **[OK]**

Handy to Know...

- **Calculated items** are much harder to get your head around than **calculated fields**. Just remember that a calculated item is one created using items *within* a specific field, while calculated fields are created *across* one or more fields.

PIVOTTABLE OPTIONS

While there are many techniques and tools available for working with and creating data and values in a PivotTable, there are also a number of options available which allow you to tweak the

PivotTable report and enhance its operation and appearance. Most of these are grouped together in the **PivotTable Options** dialog box.

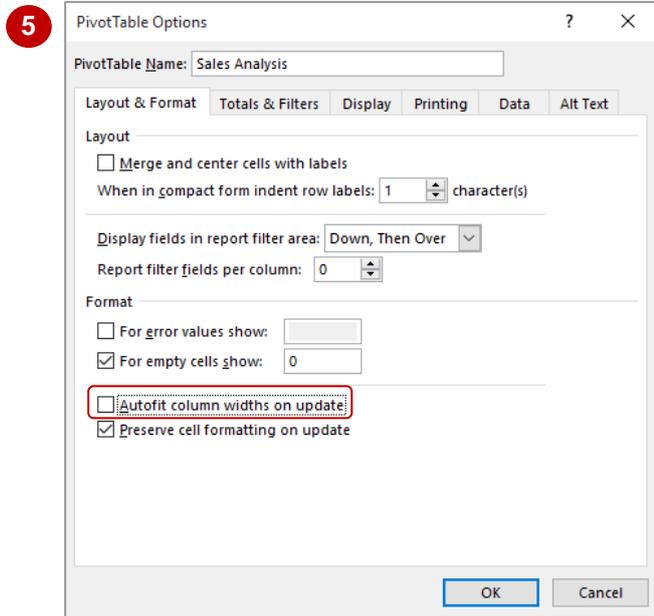
Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file *PivotTable Features_13.xlsx...*

- 1 Click in cell **B4 (Jan)**, then click on the **PivotTable Tools: Analyse** tab
- 2 Click on **Options** in the **PivotTable** group to display the **PivotTable Options** dialog box
- 3 Type **Sales Analysis** in **PivotTable Name** to rename the table
- 4 On the **Layout & Format** tab, click in **For empty cells show**, then type **0**
- 5 Click on **Autofit column widths on update** so it appears unticked (this will stop column widths from changing each time the table is updated)
- 6 Click on **[OK]** to make the changes
- 7 In the **PivotTable Fields** pane, drag the **Make** field from the **ROWS** area, then drag it back again to force an update – notice that the column widths no longer change

If the PivotTable Fields pane is not displayed, click on the PivotTable Tools: Analyse tab, then click on Field List in the Show group



	A	B	C	D	E	F	G	H
1								
2								
3	Sum of Price	Column Labels						
4	Row Labels	Jan	Feb	Variation	Mar	Grand Total		
5	BMW	43,800	34,499	-9,301	142,340	211,338		
6	Ford	92,361	12,680	-79,681	25,220	50,580		
7	GMH	12,400	18,900	6,500	22,800	60,600		
8	Hyundai	34,500	0	-34,500	0	0		
9	KIA	12,800	10,500	-2,300	19,700	40,700		
10	Mitsubishi	3,500	8,600	5,100	30,700	47,900		
11	Nissan	0	27,600	27,600	100,020	155,220		

6

For Your Reference...

To **change options** in a **PivotTable**:

1. Click in the PivotTable to select it
2. Click on **Options** in the **PivotTable** group to display the **PivotTable Options** dialog box
3. Make changes as appropriate and click on **[OK]**

Handy to Know...

- You can access the PivotTable **Options** by right-clicking on the table and selecting **PivotTable Options**.

SORTING IN A PIVOTTABLE

When a PivotTable report is created, the **Row Labels** and **Columns Labels** are alphanumerically **sorted** for you. You can change this sort order if you wish, or even sort according

to the **data values** rather than the row or column labels.

Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file *PivotTable Features_14.xlsx...*

- 1 Click in cell **F5** (the first **Grand Total** value), then click on the **Home** tab
- 2 Click on **Sort & Filter** in the **Editing** group
- 3 Select **Sort Smallest to Largest** to sort the table according to the values in the **Grand Total**
- 4 Repeat step 2 then select **Sort Largest to Smallest** to reverse the order

1

	A	B	C	D	E	F	G	H
1								
2								
3	Sum of Price	Column Labels						
4	Row Labels	Jan	Feb	Variation	Mar	Grand Total		
5	BMW	43,800	34,499	-9,301	142,340	211,338		
6	Ford	92,361	12,680	-79,681	25,220	50,580		
7	GMH	12,400	18,900	6,500	22,800	60,600		
8	Hyundai	34,500	0	-34,500	0	0		
9	KIA	12,800	10,500	-2,300	19,700	40,700		
10	Mitsubishi	3,500	8,600	5,100	30,700	47,900		
11	Nissan	0	27,600	27,600	100,020	155,220		

3

	A	B	C	D	E	F	G	H
1								
2								
3	Sum of Price	Column Labels						
4	Row Labels	Jan	Feb	Variation	Mar	Grand Total		
5	Hyundai	34,500	0	-34,500	0	0		
6	KIA	12,800	10,500	-2,300	19,700	40,700		
7	Mitsubishi	3,500	8,600	5,100	30,700	47,900		
8	Peugot	12,400	19,900	7,500	8,532	48,332		
9	Ford	92,361	12,680	-79,681	25,220	50,580		
10	GMH	12,400	18,900	6,500	22,800	60,600		
11	Renault	21,090	30,599	9,509	5,600	66,798		

4

	A	B	C	D	E	F	G	H
1								
2								
3	Sum of Price	Column Labels						
4	Row Labels	Jan	Feb	Variation	Mar	Grand Total		
5	BMW	43,800	34,499	-9,301	142,340	211,338		
6	Nissan	0	27,600	27,600	100,020	155,220		
7	Volkswagen	45,700	17,900	-27,800	70,122	105,922		
8	Toyota	41,855	22,100	-19,755	43,489	87,689		
9	Renault	21,090	30,599	9,509	5,600	66,798		
10	GMH	12,400	18,900	6,500	22,800	60,600		
11	Ford	92,361	12,680	-79,681	25,220	50,580		

For Your Reference...

To **sort** the **values** in a **PivotTable**:

1. Click on the column to sort
2. Click on the **Home** tab
3. Click on **Sort & Filter** in the **Editing** group
4. Select **Sort Smallest to Largest** or **Sort Largest to Smallest**

Handy to Know...

- More complex and multiple sorts can be done using the **Sort** dialog box which can be accessed using the **Sort** command on the **Data** tab.

NOTES:



CHAPTER 10 PIVOTCHARTS

InFocus

PivotTables create a very convenient and efficient way of analysing and interpreting data from internal lists and external databases. However, the data is presented in a tabular format. If the table is very large and complex it may be difficult to spot trends and patterns. As a consequence Excel combines the ease and convenience of **PivotTables** with its charting operations to provide you with **PivotCharts**.

In this session you will:

- ✓ learn how to create a **PivotChart** shell
- ✓ learn how to define the **PivotChart** structure
- ✓ learn how to change the **PivotChart** type
- ✓ learn how to use the **PivotChart Filter** field buttons
- ✓ learn how to move a **PivotChart** to its own chart sheet.

INSERTING A PIVOTCHART

PivotTables can sometimes become quite complex and large, making the data they contain difficult to understand. It can therefore be useful to have a way of representing the data in a

simpler format. This is where **PivotCharts** are useful. They can be used in conjunction with a PivotTable or even on their own and are created in a similar way to PivotTables.

Try This Yourself:

Open File

Before starting this exercise you **MUST** open the file *PivotCharts_1.xlsx...*

1

Click anywhere in the list of sales

This will enable Excel to determine the fields and records to be used in the PivotChart...

2

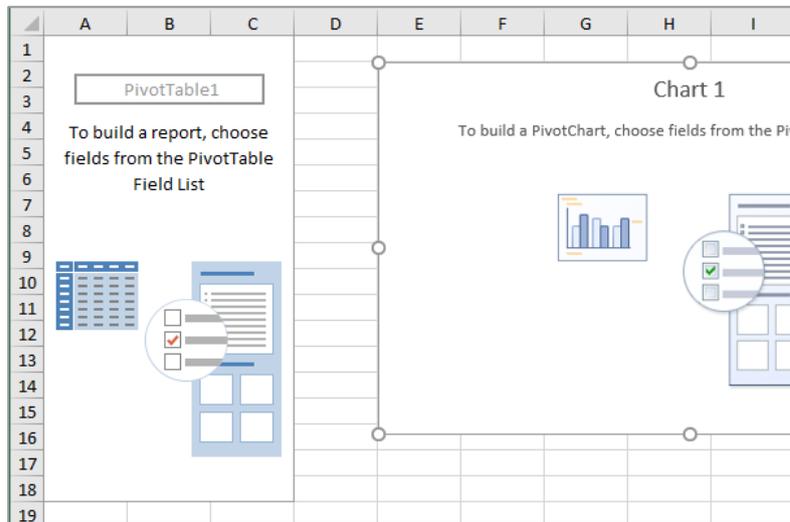
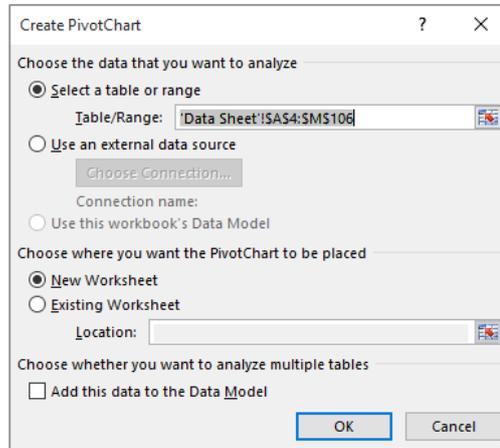
Click on the **Insert** tab, then click on the top half of **PivotChart** in the **Charts** group to display the **Create PivotChart** dialog box

3

Ensure that **Select a table or range** and **New Worksheet** are both selected, then click on **[OK]**

A PivotTable structure and a PivotChart structure will appear in a new worksheet together with the PivotChart Fields pane

2



3

For Your Reference...

To **insert** a **PivotChart**:

1. Click anywhere in the list, click on the **Insert** tab, then click on the upper half of **PivotChart** in the **Charts** group
2. Nominate the location for the table, then click on **[OK]**

Handy to Know...

- The chart appears embedded in the worksheet with the **PivotTable** as a default. It can later be moved to its own chart sheet if required.

DEFINING THE PIVOTCHART STRUCTURE

When you create a PivotTable, the **PivotTable Fields** pane displays automatically and it is by using this pane that you can create the structure of a PivotTable. In the same way when you

create a PivotChart, the **PivotChart Fields** pane displays. You can use this pane in the same way as the **PivotTable Fields** pane to create the structure of a PivotChart.

Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file *PivotCharts_2.xlsx*...

- 1 In the **PivotChart Fields** pane click on and drag the **Price** field to the **Values** area in the **PivotChart Fields** pane and release the mouse button

The *PivotChart* and *PivotTable* will now display the price values...

- 2 Repeat step 1 to position the **Salesperson** field in the **LEGEND (SERIES)** area

- 3 Repeat step 1 to drag the **Month** field to the **AXIS (CATEGORIES)** area

1 PivotChart Fields pane showing the **Price** field being added to the **VALUES** area.

2 PivotChart Fields pane showing the **Salesperson** field added to the **LEGEND (SERIES)** area.

3 The resulting PivotChart showing **Sum of Price** by **Month** (Jan, Feb, Mar) for three salespersons: Hector Smith, Justin Callaghan, and Mary O'Dwyer.

Month	Hector Smith	Justin Callaghan	Mary O'Dwyer
Jan	110,000	40,000	170,000
Feb	60,000	20,000	120,000
Mar	160,000	120,000	180,000

For Your Reference...

To **define** the **PivotChart structure**:

1. In the **PivotChart Fields** pane click on the desired field
2. Drag the field into the **COLUMNS**, **ROWS** or **VALUES** area of the pane as required

Handy to Know...

- The **PivotChart Fields** pane, though similar to the **PivotTable Fields** pane, has one main difference – the areas are named differently. For instance, **Column Labels** becomes **Legend Fields**, while **Row Labels** become **Axis Fields**.

CHANGING THE PIVOTCHART TYPE

Sometimes you may use different types of charts to represent the same data. Or you may decide, for example, that your data would be better displayed in a pie chart rather than a column

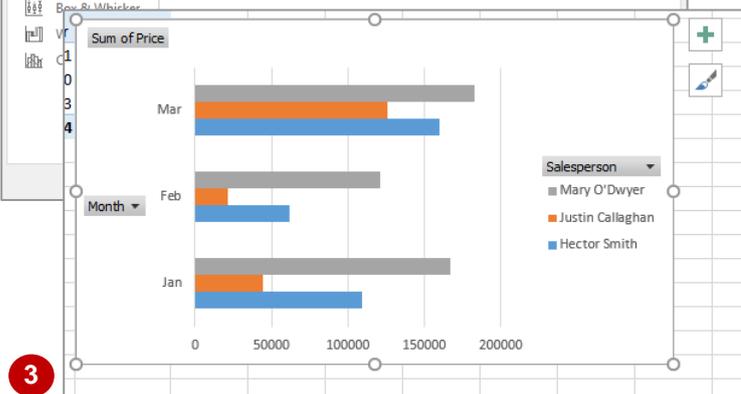
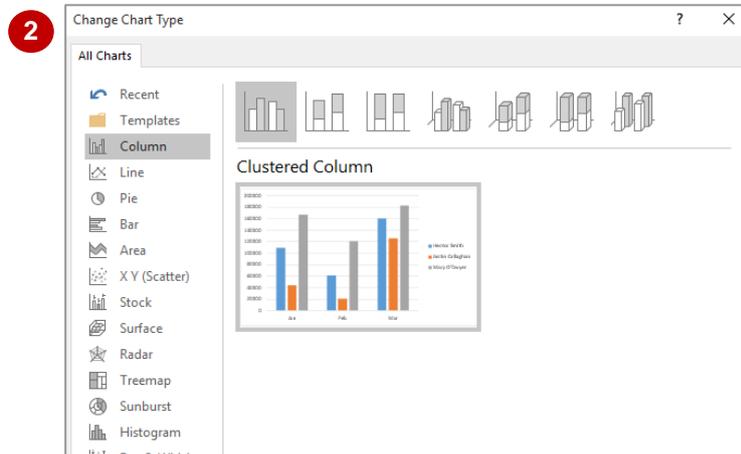
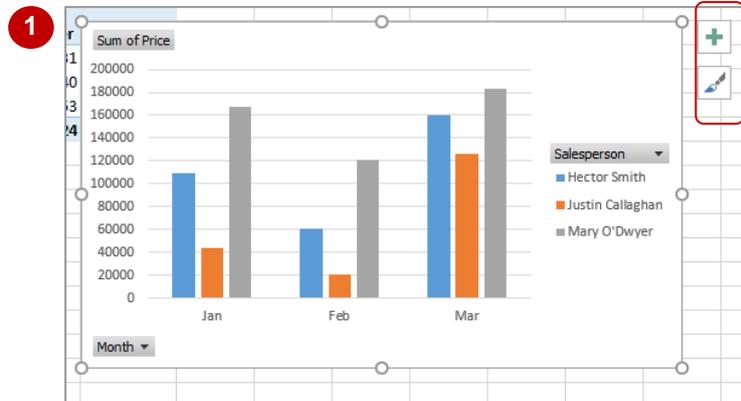
chart. You can easily convert an existing chart to a different chart type. You can also use this feature to test different chart types until you find the one that will best represent your data.

Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file *PivotCharts_3.xlsx...*

- 1 Click on the **PivotChart** to ensure it is selected and to display the **Chart Elements** and **Chart Styles** buttons to the top right of the chart
- 2 Click on the **PivotChart Tools: Design** tab, then click on **Change Chart Type** in the **Type** group to display the **Change Chart Type** dialog box
- 3 Click on **Bar** in the list on the left, then click on **[OK]** to change the PivotChart to a horizontal bar chart



For Your Reference...

To **change** the **chart type**:

1. Click on the chart to select it
2. Click on the **PivotChart Tools: Design** tab, then click on **Change Chart Type** in the **Type** group
3. Click on the desired type, then click on **[OK]**

Handy to Know...

- If you want to change the colour of your chart or the way it appears, you can click on the **Chart Styles** button which appears to the right of a chart when it is selected. Clicking on the **Chart Styles** button displays a gallery of style options you can choose from.

USING THE PIVOTCHART FILTER FIELD BUTTONS

The PivotChart Filter field buttons appear on a PivotChart. These buttons appear next to the axis and legend fields on the actual PivotChart. It allows you to perform both sorting and filtering

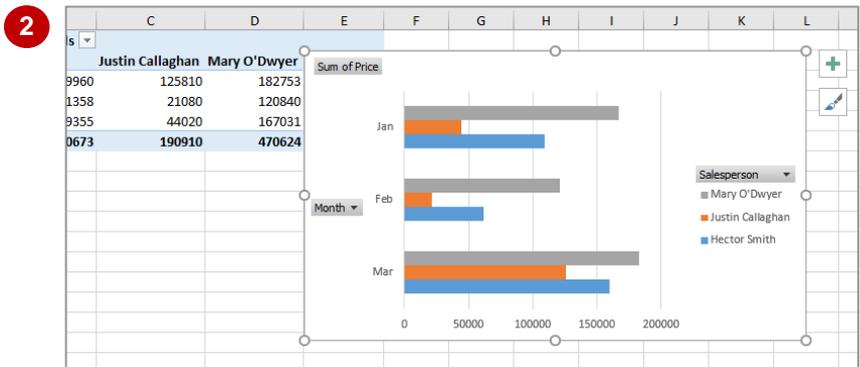
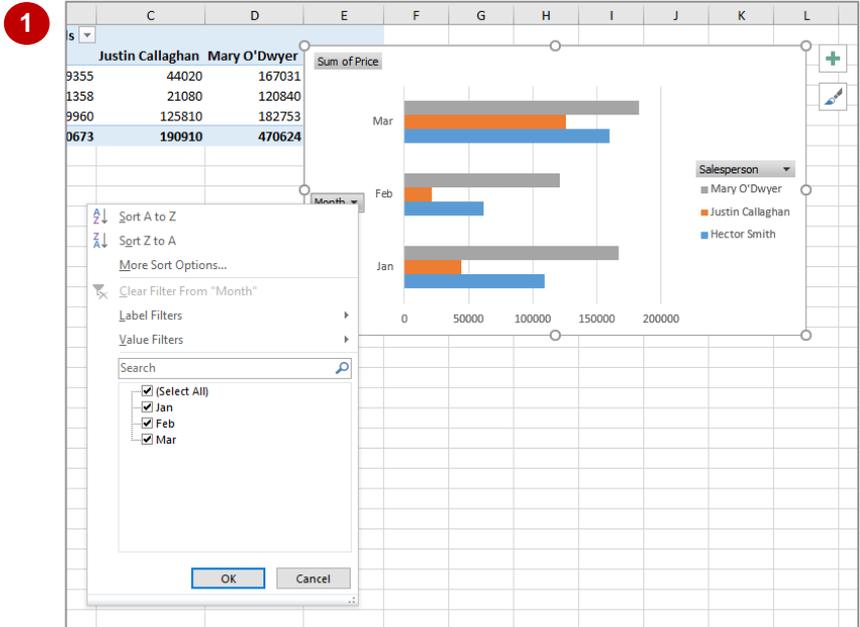
operations on the fields that have been specifically chosen for the **axis** and **legend** fields.

Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file *PivotCharts_4.xlsx...*

- 1 Click on the **Month** filter field button to see a menu of options, as shown
- 2 Click on **Sort Z to A** to see the months so that **Jan** is displayed at the top



For Your Reference...

To use a **PivotChart filter field button**:

1. Click on the appropriate filter field button on the PivotChart
2. Select an option

Handy to Know...

- In addition to performing a sort, you can also use the menus that appear in the **PivotChart Filter field buttons** to perform filtering operations. It's worth spending a few moments playing around with the filters.

MOVING PIVOTCHARTS TO CHART SHEETS

While it is convenient to see both the **PivotTable** and the **PivotChart** in the one sheet, when it comes to printing the chart or adding more detail, it is often better to have the chart in its own

sheet. PivotCharts are just like any other charts (except that their data source comes from a table) and can therefore be moved to and from a worksheet and a chart sheet.

Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file *PivotCharts_5.xlsx*...

1 Right-click on the PivotChart to display the shortcut menu

2 Select **Move Chart** to display the **Move Chart** dialog box

3 Select the text in **New sheet** and type **Sales Chart**

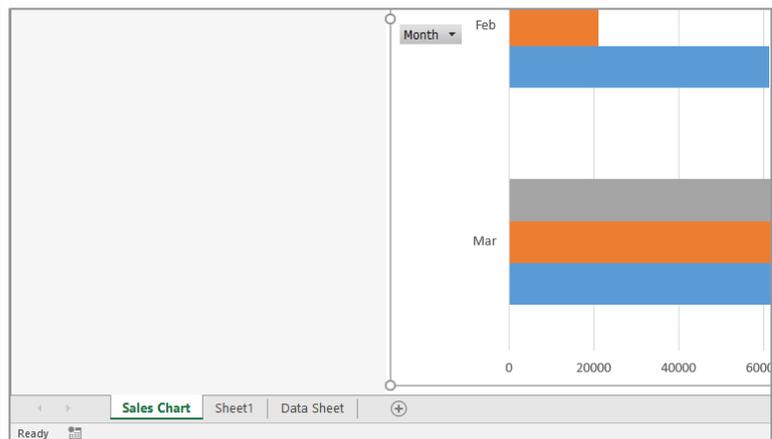
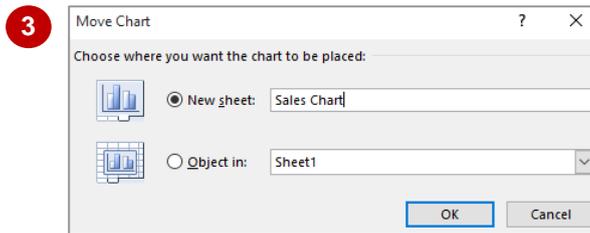
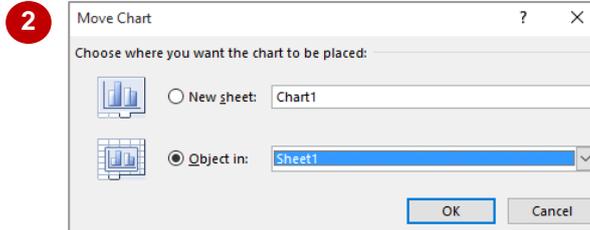
This will become the name of the new chart sheet...

4 Click on **[OK]** to move the chart to its own worksheet

Notice that the PivotTable Fields pane is still visible...

5 Click on the **Sheet 1** worksheet tab to see the PivotTable and the **PivotChart Fields** pane

The PivotTable acts as the data source for the chart



4

	A	B	C	D	E	F	G	H	I
1	Sum of Price	Column Labels							
2	Row Labels	Hector Smith	Justin Callaghan	Mary O'Dwyer	Grand Total				
3	Mar	159960	125810	182753	468523				
4	Feb	61358	21080	120840	203278				
5	Jan	109355	44020	167031	320406				
6	Grand Total	330673	190910	470624	992207				
7									
8									
9									
10									

5

For Your Reference...

To **move** a **PivotChart** to its **own sheet**:

1. Right-click on the PivotChart, then select **Move Chart**
2. Provide a new chart sheet name, then click on **[OK]**

Handy to Know...

- Even when a PivotChart is moved to its own chart sheet, it still retains the same functionality as when it was embedded in the same worksheet as the PivotTable.



Congratulations!

You have now completed Microsoft Excel 2016 - Using as a Database. Microsoft Excel 2016 - Using as a Database was designed to get you to the point where you can competently perform a variety of operations.

We have tried to build up your skills and knowledge by having you work through specific tasks. The step by step approach will serve as a reference for you when you need to repeat a task.

Where To From Here?

The following is a little advice about what to do next:

- Spend some time playing with what you have learnt. You should reinforce the skills that you have acquired and use some of the application's commands. This will test just how much of the concepts and features have stuck! Don't try a big task just yet if you can avoid it - small is a good way to start.
- Some aspects of the course may now be a little vague. Go over some of the points that you may be unclear about. Use the examples and exercises in these notes and have another go - these step-by-step notes were designed to help you in the classroom and in the work place!

Here are a few techniques and strategies that we've found handy for learning more about technology:

- read computer magazines - there are often useful articles about specific techniques
- if you have the skills and facilities browse the Internet, specifically the technical pages of the application that you have just learnt
- take an interest in what your work colleagues have done and how they did it - we don't suggest that you plagiarise but you can certainly learn from the techniques of others
- if your software came with a manual (which is rare nowadays) spend a bit of time each day reading a few pages. Then try the techniques out straight away - over a period of time you'll learn a lot this way
- and of course, there are also more courses and books for you to work through.

Hungry for More?

We live in an ever-changing world where we all need to review and upgrade our skills.

If you have received this course book on a training course why not ask the tutor or trainer for other courses that may be of benefit to you. If you are attending a college ask for one of their brochures.

Alternatively, if you've enjoyed using this course book you can find others that cover a wide range of topics at our web site www.watsoniapublishing.com.

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