

A *PivotTable* tool is found in Excel that allows you to analyse data in lists. Lists allow you to record data – this could be a list of daily sales, a list of songs in your music collection, a list of petty cash purchases over the last three months, or whatever. 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 records, trying to manually analyse the data and extract useful information can be tedious. *PivotTable Reports* provide a way for automatically analysing the data found in lists.

In this session you will:

- ✓ gain an understanding of pivot tables in **Excel**
- ✓ learn how to create a **PivotTable** shell
- ✓ learn how to drag fields into a **PivotTable** shell
- ✓ learn how to filter the data in a **PivotTable** report
- ✓ 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**.

UNDERSTANDING PIVOT TABLES

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

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

1 The List

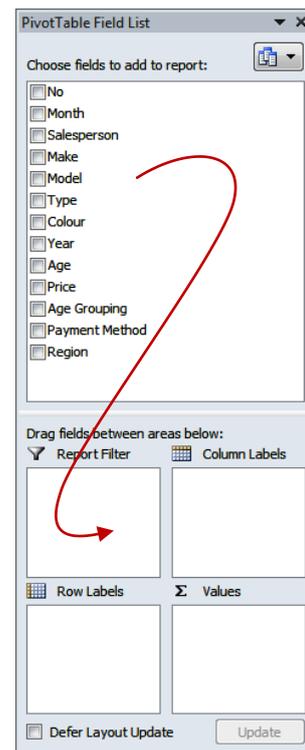
The following list shows the column or **field** names across the top of the list. Each row in the list is equivalent to one record. Our example actually holds 102 records.

No	Month	Salesperson	Make	Model	Type	Colour	Year	Age	Price	Age Grouping	Payment Method	Region
1	Jan	Mary O'Dwyer	Toyota	Corolla	Sedan	Red	1988	22	3,500	26-35	Cash	South
2	Jan	Justin Callaghan	BMW	3 Series	Sedan	Silver	2003	7	15,900	46-55	Credit Card	East
3	Jan	Hector Smith	Toyota	Celica	Coupe	Yellow	2001	9	12,500	36-45	Credit Card	South
4	Jan	Mary O'Dwyer	Ford	Explorer	SUV	Silver	2002	8	43,211	46-55	Bank Cheque	South
5	Jan	Mary O'Dwyer	Hyundai	Elantra	Sedan	White	2001	9	15,600	26-35	Personal Cheque	East
6	Jan	Justin Callaghan	Ford	Fiesta	Sedan	Green	2000	10	2,050	25 or less	Cash	East
7	Jan	Hector Smith	BMW	Z3	Coupe	Silver	2000	10	11,000	36-45	Credit Card	South
8	Jan	Hector Smith	Toyota	Corolla	Sedan	White	1999	11	2,300	25 or less	Bank Cheque	South
9	Jan	Mary O'Dwyer	Toyota	Activa	Wagon	Yellow	2001	9	3,900	26-35	Cash	South
10	Jan	Mary O'Dwyer	KIA	Mini	Sedan	Red	2005	5	12,300	Over 55	Bank Cheque	North
11	Jan	Mary O'Dwyer	Volkswagen	Toureg	SUV	Silver	2008	2	43,200	46-55	Credit Card	North
12	Jan	Justin Callaghan	Mitsubishi	Lancer	Sedan	Red	2001	9	3,500	25 or less	Bank Cheque	North

2 Asking the Question

Pivot tables 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 in sales has been made by each salesperson over the three months of data in the list.

The question is phrased by dragging the relevant column headings (known as **fields**) into special areas created in the **PivotTable** pane. The **PivotTable** pane appears when you tell Excel you wish to insert a pivot table, or when an existing pivot table is selected.

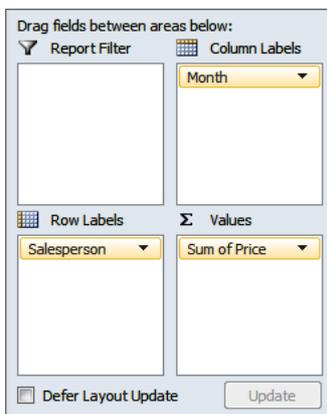


3 Obtaining the Answer

Once relevant column fields have been dragged into the fields area, Excel will use the data corresponding to the headings from the list to perform an analysis and answer the question.

In the example below, the **Salesperson** field has been dragged to the **Row Labels** area, and the **Month** field has been dragged to the **Column Labels** area.

As soon as the **Price** field was dragged to the **Values** area, the pivot table summed all of the price amounts by month and salesperson and also created grand totals as shown. We now know that Hector Smith made 61,358 in the month of February.



	A	B	C	D	E
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					
10					

CREATING A PIVOTTABLE SHELL

PivotTables perform their analytical operations in a defined structure that resembles a table. The PivotTable structure can be placed either in the current worksheet or in a new sheet in the

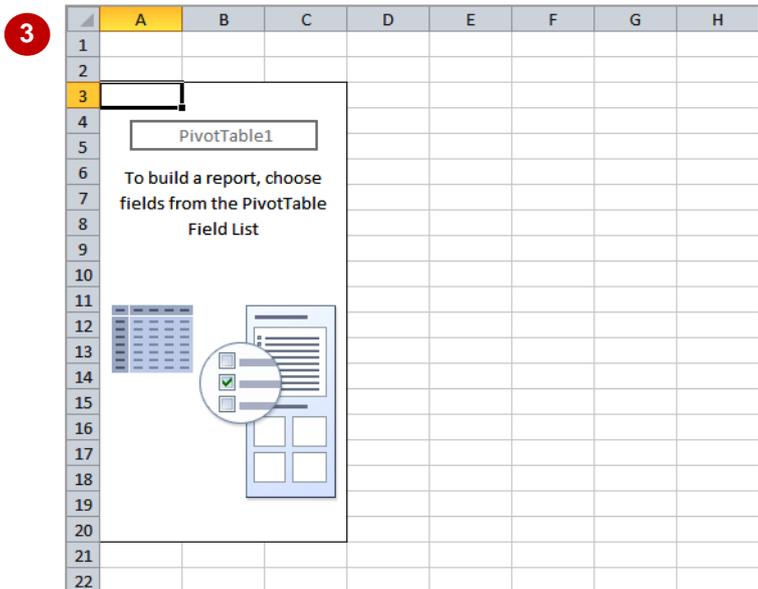
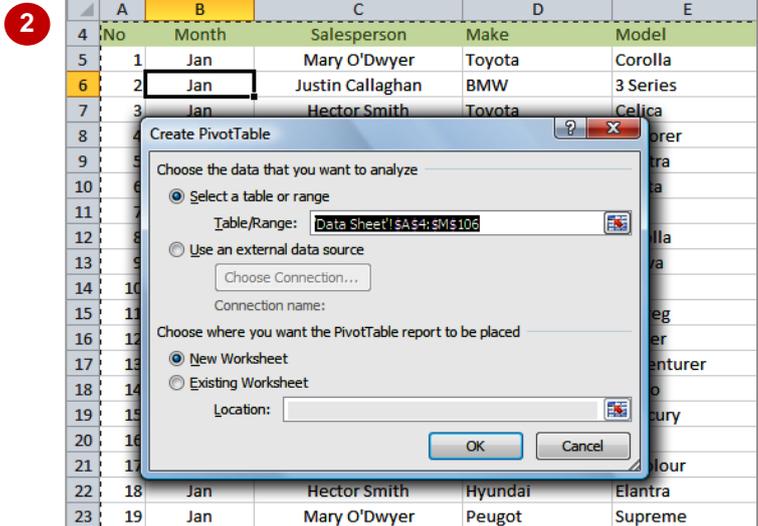
workbook. When the structure, which we'll refer to as a *shell*, is selected a **PivotTable** pane will appear showing the fields that can be dragged into the shell for use in analysis.

Try This Yourself:

Open File

Before starting this exercise you **MUST** open the file *E839 Pivot Tables_1.xlsx...*

- 1 Click anywhere in the list of sales – this will enable Excel to determine the fields and records that can be used in the pivot table
- 2 Click on the **Insert** tab of the **Ribbon** and click on **PivotTable**  to display the **Create PivotTable** dialog box
This dialog box is used to specify where to place the PivotTable...
- 3 Ensure that **Select a table or range** and also **New Worksheet** are both selected, then click on [OK] to display a new sheet with a *PivotTable* shell and the *PivotTable* pane



For Your Reference...

To **create** a **PivotTable shell**:

1. Click anywhere in the list
2. Click on the **Insert** tab of the **Ribbon** and click on **PivotTable** 
3. Nominate the location for the table and click on [OK]

Handy to Know...

- It is usually best to place the pivot table in a separate worksheet away from the main list to avoid accidentally losing data from the list when working with the table, and to avoid disrupting the table when working with the list.

DROPPING FIELDS INTO A PIVOTTABLE

Pivot tables work by analysing two or more variables – these variables are usually the fields from a list. Once a PivotTable shell has been constructed the **variables** (*fields*) required for the

analytical operation can be dragged to the shell using the **PivotTable pane** that appears when the PivotTable shell is selected.

Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file *E839 Pivot Tables_2.xlsx...*

1 Move the mouse pointer onto the **Month** field in the **PivotTable pane** until the mouse pointer appears with four arrows

2 Hold down the left mouse button and drag the **Month** field to the **Column Labels** area in the pane

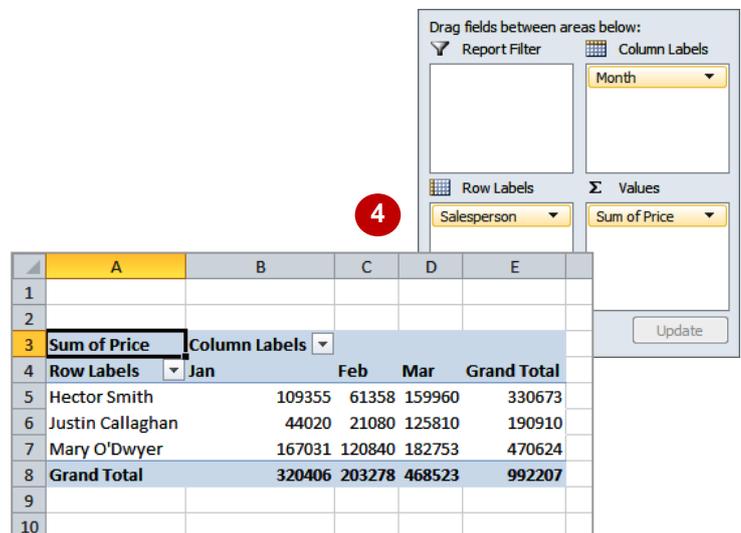
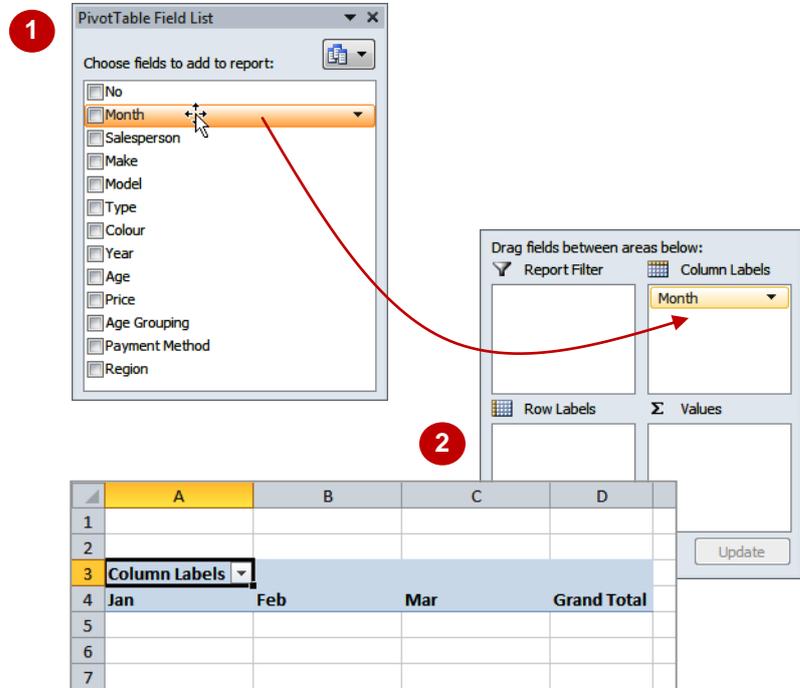
The months will now appear as columns in the shell...

3 Drag the **Salesperson** field to the **Row Labels** area in the pane

The salesperson names will now appear in the left column of the shell...

4 Drag the **Price** field to the **Values** area in the pane

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



For Your Reference...

To **drop fields** into a **PivotTable shell**:

1. Click on the desired field in the **PivotTable pane**
2. Drag the field into the **Column Labels**, **Row Labels**, or **Values** area of the pane as required

Handy to Know...

- You can also place fields into a PivotTable shell by double-clicking them in the **PivotTable pane**. This method is less precise than dragging and is not recommended until you are really comfortable with PivotTable operations.

FILTERING A PIVOTTABLE REPORT

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

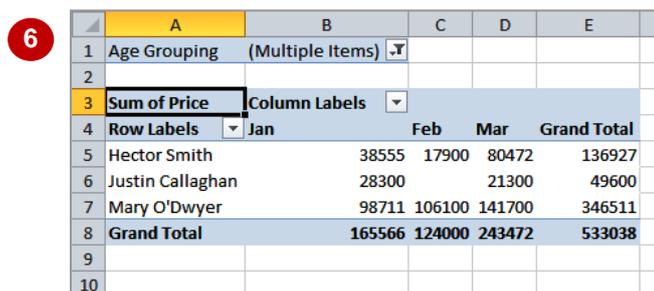
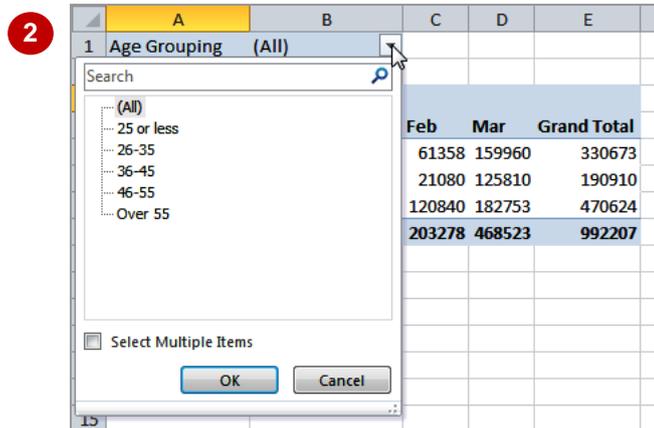
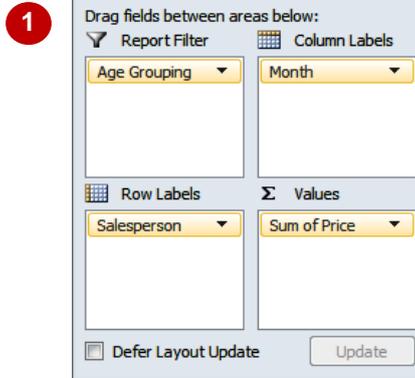
by applying a **filter**. This can be done by dragging an additional variable (field) to the **Report Filter** area in the PivotTable pane.

Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file *E839 Pivot Tables_3.xlsx...*

- 1 Move the mouse pointer to the **Age Grouping** field in the PivotTable pane and drag the field to the **Report Filter** area of the pane
- 2 Click on the drop arrow  that has appeared to the right of **Age Grouping (All)** in the worksheet – a list of all values in the field will now appear
- 3 Click on **25 or less** then click on **[OK]** to see the summed sales for customers aged 25 or under
- 4 Repeat step 3 for some of the other age groupings
- 5 Click on the filter button  at the right of **Age Grouping** to see the filter list and click on **Select Multiple Items** until it appears with a tick
- 6 Click on the options until both (and only) **46 – 55** and **55 or over** appear with a tick, then click on **[OK]**



For Your Reference...

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

1. Drag the filter field to the **Report Filter** area
2. Click on the filter drop arrow  in the PivotTable report
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**. In the example above if you clicked on the drop arrow for **Column Labels** you would see the names of the months (*Jan, Feb, Mar*).

CLEARING A REPORT FILTER

Report filters provide another dimension to PivotTable reports 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, or, if you no longer need to retain the filter, remove the entire filter field from the **Report Filter** area.

Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file *E839 Pivot Tables_4.xlsx*...

1 Click on the filter button  at the right of **Age Grouping** in the worksheet, to see the filter list

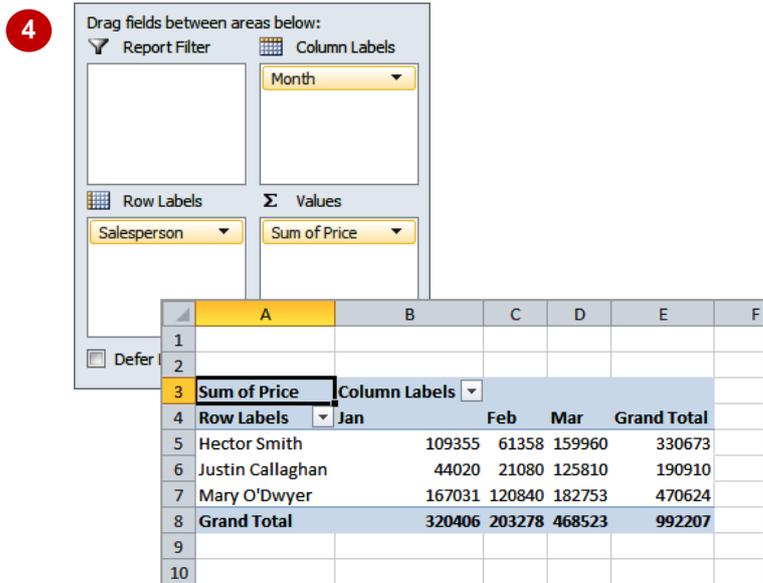
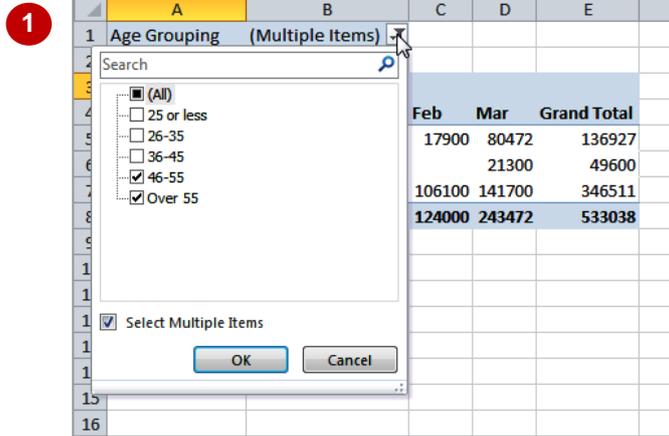
2 Click on **Select Multiple Items** until it appears without a tick

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 Move the mouse pointer to the **Age Grouping** field in the **Report Filter** area in the **PivotTable** pane and drag the field listing back to the **Field** list at the top of the pane

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 filter button  at the right of the filter field in the table
2. Click on **All**
3. Click on **[OK]**

Handy to Know...

- You can also remove **Row Labels** and **Column Labels** by dragging them out of their respective areas in the **PivotTable** pane.

SWITCHING PIVOTTABLE LABELS

PivotTables are all about asking questions of the data in a list. However, the game is far from over once you've created a PivotTable. At any time you can modify the **Row** or **Column Labels**

essentially asking 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 *E839 Pivot Tables_5.xlsx*...

- 1 Move the mouse pointer to **Salesperson** in the **Row Labels** area of the PivotTable pane and drag the field up into the fields listing at the top of the pane

Notice now how only the **Column Label totals** are left in the table...

- 2 Drag the **Payment Method** field, from the field list in the PivotTable pane, to the **Row Labels** area

You should now see sales by **Payment Method** over the three months...

- 3 Drag the **Payment Method** field up to the field listing, then drag **Make** from the field listing to the **Row Labels** area

You should now see the sales by **Make of vehicle** over the three months

1

	A	B	C	D	E	F
1						
2						
3						
4		Jan	Feb	Mar	Grand Total	
5	Sum of Price	320406	203278	468523	992207	
6						
7						
8						

3

	A	B	C	D	E	F
1						
2						
3	Sum of Price					
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						

For Your Reference...

To **modify the structure** of a PivotTable:

1. Click on a field in either the **Row** or **Column Labels** area and drag it to a different location in the PivotTable pane

Handy to Know...

- Wondering what **Defer Layout Update** on the PivotTable 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 super large lists which may take a while to recalculate.

FORMATTING A PIVOTTABLE REPORT

PivotTable reports can be cryptic creatures 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 **Design** tab of the **Ribbon** you can really jazz up a PivotTable report and in the process make it more understandable.

Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file *E839 Pivot Tables_6.xlsx*...

1 Click on the **PivotTable Tools: Design** tab of the **Ribbon**, then click on **Banded Rows** in the **PivotTable Style Options** group until it appears with a ticked

Coloured bands should now appear in the PivotTable...

2 Click on the **Banded Columns** command to apply column bands in the PivotTable

3 Remove the tick from both **Banded Rows** and **Banded Columns** to remove the banding

4 Move the mouse pointer over various options in the **PivotTable Styles** group – the PivotTable displays a preview of that style

5 Once you have found a style that you are satisfied with, click on it to apply it to the PivotTable

1

	A	B	C	D	E	F
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						

2

	A	B	C	D	E	F
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						

4

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
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														

For Your Reference...

To **format** a **PivotTable** return:

1. Click on the **Design** tab of the **Ribbon**
2. If you want bands, click on the relevant banding command until it is ticked
3. Choose a **PivotTable Style**

Handy to Know...

- You can also use the standard formatting options for worksheets rather than apply a global style or banding.

UNDERSTANDING SLICERS

While it's an odd sounding name a **Slicer** is really just 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.

What Is A Slicer

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**.

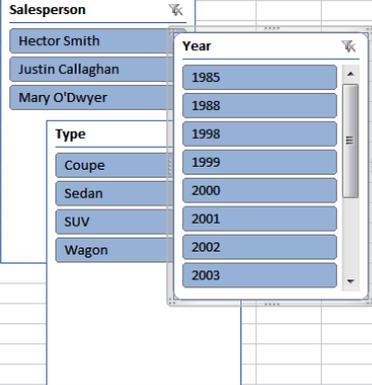
	A	B	C	D	E	F	G	H
1								
2								
3	Sum of Price	Column Labels						
4	Row Labels	Jan	Feb	Mar	Grand Total			
5	BMW	11000	29419	33940	74359			
6	Ford	32100	2540	9000	43640			
7	GMH	12400		14500	26900			
8	Hyundai	18900			18900			
9	KIA	500	2000	19700	22200			
10	Mitsubishi		4300	5700	10000			
11	Nissan		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								
18								
19								
20								



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
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											
19											
20											
21											
22											
23											
24											
25											
26											



In the example above three **Slicers** have been created – one **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

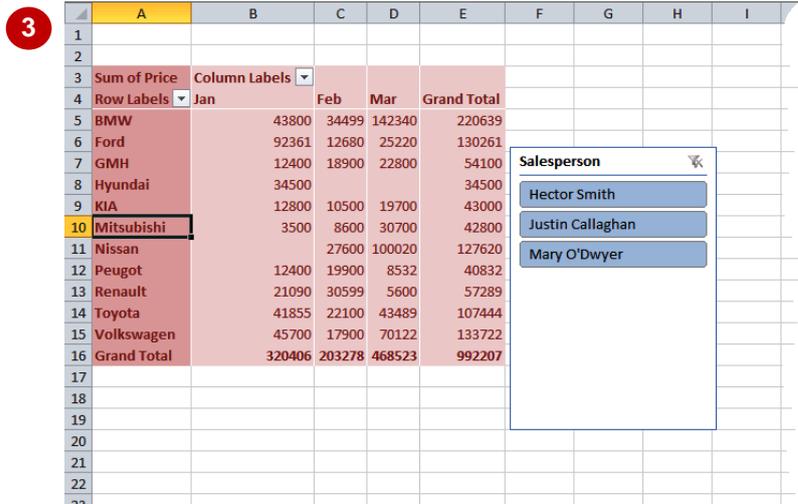
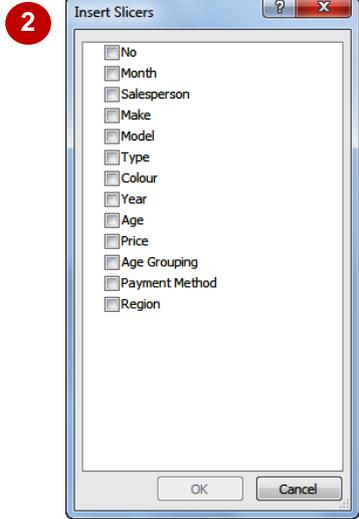
comprising of a rectangle and special filter buttons. **Slicers** are inserted into the worksheet from the **Slicer** command on the **Insert** tab of the **Ribbon**.

Try This Yourself:

Open File

Before starting this exercise you **MUST** open the file *E839 Pivot Tables_7.xlsx...*

- 1 Click anywhere in the **PivotTable** in the worksheet
- 2 Click on the **Insert** tab on the **Ribbon** and click on **Slicer** to display the Insert **Slicers** dialog box
- 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**
- 5 Click on **Mary O'Dwyer** to see only the sales made by her
- 6 Click on the **Clear Filter** button  to see all of the sales again



For Your Reference...

To insert a **Slicer**:

1. Click anywhere in the **PivotTable**
2. Click on the **Insert** tab and click on **Slicer**
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 the **[Ctrl]** key and click on subsequent samples.