Excel: Working with Data

V1.0

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Contents

Introduction

Excel 2016 is often used to store and analyse large data sets. This course will look at tools and techniques that enable and simplify the working with these data sets, both in performing calculations and in filtering the data.

Objectives

On successful completion of this course participants will be able to:

- Define a data list.
- Use advanced techniques to navigate and select data
- Use outlining tools to more conveniently present data
- Create Tables
- Use Structured references in formulas
- Use calculated columns in an Excel tables
- Use basic filtering to extract data.
- Use Advanced filtering to extract data

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Excel: Working with Data

1 Introduction - Databases

a. What is a Database?

It is a collection of information on any one area of interest (eg. a phone book, library catalogue, stock list, student or employee information, patient study results). Based on the employee information example, a database in Excel is composed of a -

field - any single piece of information (eg. employee surname, age or date of birth). This is placed in one column in Excel

record - the collective field information on one employee. A record takes up one row in Excel

header record - normally a row of cells which appear at the top, before the first record, outlining the names for the fields in the list

database (list) - all records, consisting of all necessary information on every employee of the company

Working with lists you can -

edit - use a special data form to add, change or delete records from the list

sort - sort the list into alphabetical, numerical or chronological order

filter - show a subset of records by filtering, using defined criteria, to see just the data you want

sub-total - insert automatic subtotals without creating formulas

analyse - compare and analyse data

report - devise a report from the data in Pivot table or Pivot chart form

b. Do I need Excel?

If the information, laid out in columns, requires complex formatting such as bulleted lists, custom tabs, numbering, or hanging indents, use Word.

If complex calculations, statistical analysis, queries, or charts, are required, use Microsoft Excel. However, if your list entries exceed **255 characters** in length, the size of the database slows Excel's processes, or if the database is so complex it requires too much time performing filters, use Access instead.

For powerful sorting and searching capabilities, use either Access or Excel.

If you need full relational database capabilities, create your list in Access.

2 Guidelines for creating a list on a worksheet

Excel has a number of features that make it easy to manage and analyse data in a list. To take advantage of these features, enter data in a list according to the following guidelines.

a. List size and location

- Avoid having more than one list on a worksheet, because some list management features, such as filtering, can be used on only one list at a time.
- Leave at least one blank column and one blank row between your list and other data on the worksheet. This helps Excel select your list when you sort, filter, or insert automatic subtotals.
- Avoid putting blank rows and columns in the list so that Excel can more easily detect and select the list.
- Avoid placing critical data to the left or right of the list; the data might be hidden when you filter the list.

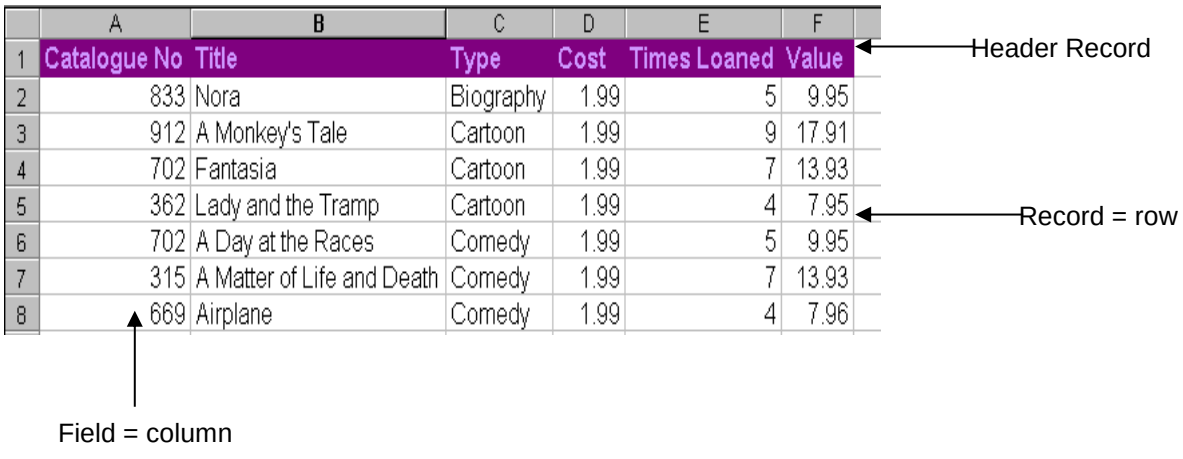
b. Header Record (field names)

- Create field names (column labels) in the first row of your list. Excel uses these labels to create reports and to find and organise data. You can **use letters, numbers and spaces** in these names.
- Use a font, data type, alignment, format, pattern, border, or capitalisation style for field names that is different from the format you assign to the data in your list.
- Use cell borders to insert lines below field names if you want to separate the header record from the data. Don't use blank rows or dashed lines.

c. Row and Column contents

- Start entry for the first record immediately below the Header Record - do not leave a blank row.
- Design your list so that all rows have similar items in the same column.
- Don't insert extra spaces at the beginning of a cell; extra spaces affect sorting and searching.
- Use the same format for all cells in a column.

In Excel, you don't need to do anything special to your list to make it a database. When you perform database tasks, such as finding, sorting, or subtotalling data, Microsoft Excel automatically recognises your list as a database.



3 Entering data onto the list

a. Manually

You can enter information below each field name, pressing the TAB key to move on to the next column, or SHIFT TAB to move back through the columns.

b. Some shortcuts

Multiple cell entry

If you are entering data into the list manually, to type the same data into several cells at once - select the cells in which you want to enter data (they can be adjacent or nonadjacent). Type the data and press CTRL ENTER.

Autocomplete cell entry

If the first few characters you type in a cell match an existing entry in that column, Excel fills in the remaining characters for you. This is effective only in cells that contain text or text and numbers combined. Entries with numbers only, dates or times are not completed.

- To accept the entry, press ENTER. The completed entry exactly matches the pattern of uppercase and lowercase letters of the existing entries.
- To replace the automatically entered characters, continue typing.
- To delete the automatically entered characters, press BACKSPACE.

To turn off automatic completion of entries in columns, choose the File Menu, Options, Advanced, Editing options and deselect the *Enable AutoComplete for cell values* check box

If Excel can't determine the correct entry, you can select an entry. Type at least one character in the cell and then press ALT+↓ to display the list of entries already in the column. You can also click the right mouse button in the cell and choose *Pick From Drop-down List…*, from the Shortcut Menu

Copy down and right

To copy data from the cell above into the current cell	CTRL D
To copy data from the cell to the left into the current cell	CTRL R

Task: Add items to a list

2 Open the 1 – Datalists.xlsx file from the practice folder

3 Select the First Datalist worksheet

4 Navigate to cell A1 (CTRL + Home)

5 Type "Name" in the cell

6 Use the TAB key to complete the cell

7 Type “Sex” in the B1 Cell followed by TAB

8 Type “Age” in the C1 Cell followed by ENTER

9 Complete the table with the following information

	A	B	C
1	Name	Sex	Age
2	Judith	F	41
3	John	M	39
4	Mary	F	18
5	Ian	M	36
6	Robert	M	22
7	Aaron	M	35
8	Sally	F	30
9	Amy	F	37
10	Gavin	M	45
11	Margy	F	25
12			

4 Adding/Removing fields

a. Adding a new field

1 Select the column to the right of where you wish the new field inserted

2 Right click over the selection and choose Insert

or

CTRL + (numeric keypad)

3 Type the field name at the top and then either use the Data Form to input the data to this field for each record, or input directly onto the sheet

If adding in data for an extra field via the form, use the scroll bar to go from record to record, **NOT** Find Prev or Find Next

b. Removing a field

1 Select the column

2 Right click over the selection and choose Delete

or

CTRL - (numeric keypad)

Task: Add a field

1 Select The C column

2 Right click the C column head

3 Select Insert from the drop down menu

4 In cell C1 add the heading “Eye Colour”

5 Complete the column:

	A	B	C	D
1	Name	Sex	Eye Colour	Age
2	Judith	F	Brown	41
3	John	M	Blue	39
4	Mary	F	Blue	18
5	Ian	M	Grey	36
6	Robert	M	Brown	22
7	Aaron	M	Grey	35
8	Sally	F	Brown	30
9	Amy	F	Grey	37
10	Gavin	M	Blue	45
11	Margy	F	Brown	25
12				

5 Adding/Removing Records

a. Adding – Manually

Sit the cursor on the first blank cell below the last record and start typing.

b. Removing – Manually

1 Select the row containing the record, by clicking the row number to the left

2 If you want to delete more than one record, the normal selection methods apply, ie. CTRL click to select non-adjacent row numbers and click on the first row number, SHIFT click on the last row number, to select a number of consecutive rows

3 Click the right mouse button over the selection and choose Delete

or

CTRL – (numeric keypad)

6 Outline (group) data in a worksheet

If you have a list of data that you want to group and summarize, you can create an outline of up to eight levels, one for each group.

Each inner level, represented by a higher number in the outline symbols, displays detail data for the preceding outer level, represented by a lower number in the outline symbols. Use an outline to quickly display summary rows or columns, or to reveal the detail data for each group.

You can create an outline of rows (as shown in the example below), an outline of columns, or an outline of both rows and columns.

a. Use the Auto Outline tool

If your data is already organised with subtotals and totals, you can outline levels to the data using the auto Outline tool.

Task: Use Auto Outline

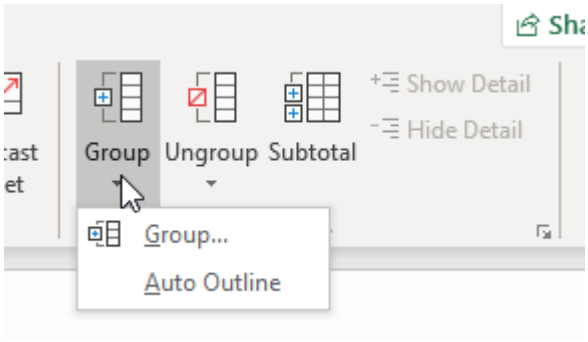
With the 2 – Outline.xlsx file still open:

1 Select the **Auto Outline** worksheet

2 Take a moment to study the sheets structure, pay close attention to rows 98, 218, 329, 504 and 505

3 Place your selection somewhere within the datalist

4 From the **Data** ribbon, select the group menu

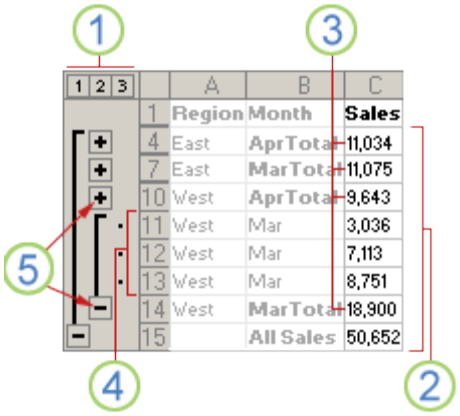


5 Select **Auto Outline**

6 Observe the results

b. Show or hide outlined data

Once you have created an outline, you can now use it to show and hide the outline data. Using the outline controls you may collapse by level, or you can collapse just a single selection of data.



1 To display rows for a level, click the appropriate 1 2 3 outline symbols.

2 Level 1 contains the total sales for all detail rows.

3 Level 2 contains total sales for each month in each region.

4 Level 3 contains detail rows — in this case, rows 11 through 13.

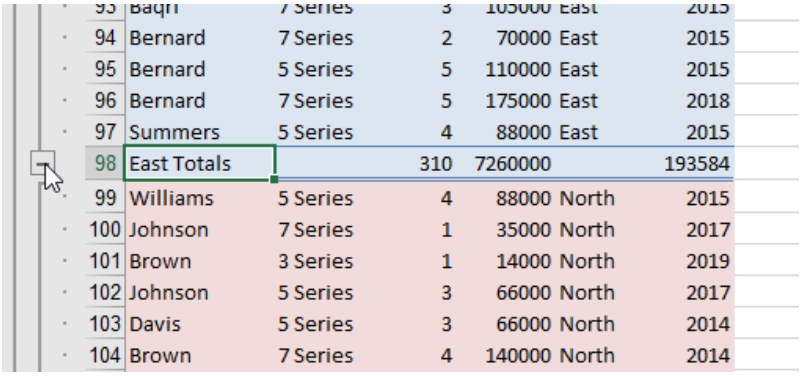
5 To expand or collapse data in your outline, click the + and − outline symbols.

Task: Show and Hide Outline Data

With the Auto Outline worksheet still open:

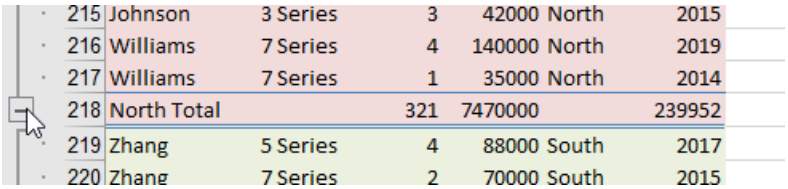
1 Scroll to **row 98** of the worksheet

2 Click the – symbol in the Outline pane to the left



3 Scroll to **row 218**

4 Click the – symbol in the Outline pane to the left



215	Johnson	3 Series	3	42000	North	2015
216	Williams	7 Series	4	140000	North	2019
217	Williams	7 Series	1	35000	North	2014
218	North Total		321	7470000		239952
219	Zhang	5 Series	4	88000	South	2017
220	Zhang	7 Series	2	70000	South	2015

5 Repeat for rows 329 and 504

6 Observe the results

7 At the top of the outline pane, select the No 1 Symbol

8 At the top of the outline pane, select the No 2 Symbol

9 At the top of the outline pane, select the No 3 Symbol

c. The Subtotal Tool

The subtotal tool creates a series of groups including a subtotal in a list or database.

To be able to use the subtotal tool to create groups you must use the sort tools to sort the fields you wish to add subtotals to.

It is generally easier to create a list with subtotals by using the Subtotal command in the Outline group on the Data tab in the Excel desktop application. Once the subtotal list is created, you can modify it by editing the SUBTOTAL function.

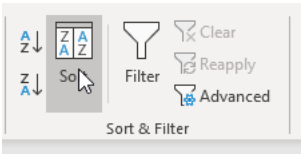
Task: Using the Subtotal Command

1 Open the **2 – Outline.xlsx** practice file

2 Select if necessary, the **Subtotals** worksheet

3 Place the selection anywhere within the datalist (eg cell D10)

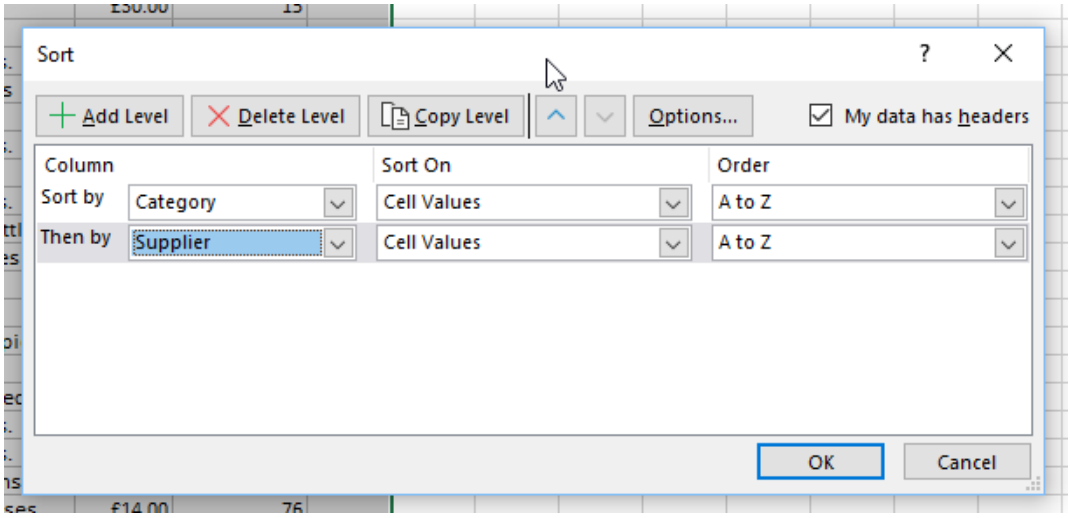
4 From the **Data** ribbon choose **Sort**



5 In the **Sort by** Select **Category**

6 Click **Add Level**

7 Complete the fields as such:

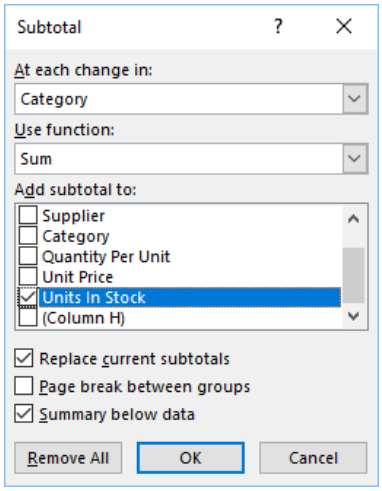


8 Click **OK**

9 From the **Data** ribbon, select **Subtotal**

10 In the **At each change in:** field select **Category**

11 In the **Add subtotal to:** field tick **Units In Stock**



The dialog box should look like this.

12 Click **OK**

13 Observe the result.

14 Ensure your selection is within the datalist

15 From the **Data** ribbon, select **Subtotal**

16 In the **At each change in:** field select **Supplier**

17 In the **Add subtotal to:** field tick **Units In Stock**

18 Untick **Replace current subtotals**

19 Click **OK**

20 Observe the results

21 From the **Data** ribbon, select **Subtotal**

22 Click **Remove All**

d. Create an outline of rows or columns

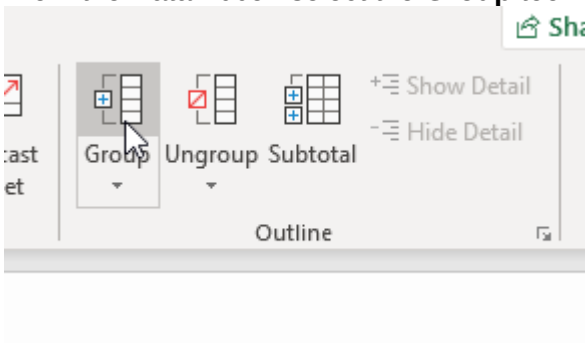
As well as being able to use automatic tools to create outlines, you can also select rows or columns and create an outline from them. To do so simply select the rows or columns that you wish to include in an outline. Then use the Group tool.

Task: Outline by Columns

1 Select the **Outline by Columns** worksheet

2 Highlight columns **D, E, F** and **G**

3 From the Data ribbon select the **Group** tool



4 Observe the result

e. Remove an outline

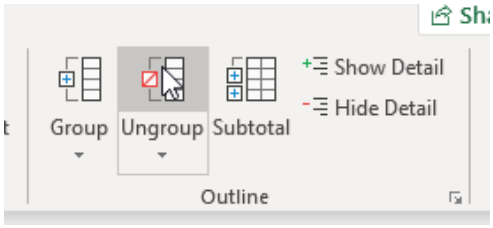
Outlines that have been created by using the Auto Outline or the Group tools can be removed using the clear outline or ungroup tools

Task Use the Ungroup Tool

1 Click on the Outline by Columns worksheet tab

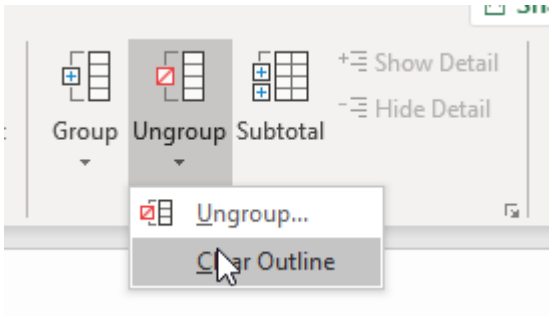
2 Select columns **E** and **F**

3 From the **Data** ribbon select **Ungroup**



Notice that the group has been split in two,

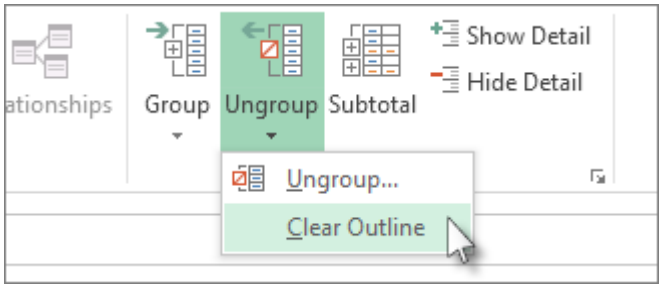
4 Select Clear outline from the Ungroup drop down menu



5 Notice that the Outlines have been entirely cleared from the worksheet

6 Click the **Auto Outline** worksheet.

7 One the **Data** tab, in the **Outline** group, click **Ungroup** and click **Clear Outline**.



Important: If you remove an outline while the detail data is hidden, the detail rows or columns may remain hidden. To display the data, drag across the visible row numbers or column letters adjacent to the hidden rows and columns. On the **Home** tab, in the **Cells**group, click **Format**, point to **Hide & Unhide**, and then click **Unhide Rows** or **Unhide Columns**.

7 Format as Table

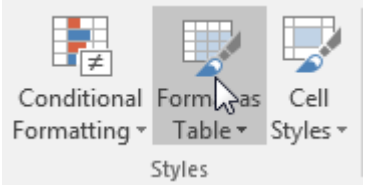
Microsoft added the Format as Table tool in Excel 2007 and have continued to increase it's function in subsequent versions of Excel. The tool aims to make working with large datalists easier. The tool works in conjunction with other tools in Excel such as chart, pivot tables and functions.

One or two tools in Excel such as the Subtotals tool will not work if you have created a table, but you can revert the table back to a normal range if you find this is the case.

a. Creating a Table

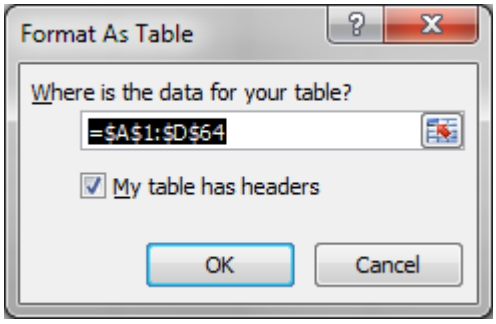
1 Begin by clicking in to the datalist that you wish to convert to a table

2 From the **Home** ribbon, select **Format as Table**



3 Choose a Table Style that is visually close to your requirements

4 A dialogue box will appear. Double check that Excel has correctly identified the extents of your datalist and that you have or do not have headers



Click **OK**

5 The table will have been created and given the name Table1 (if this is the first table created in the document)

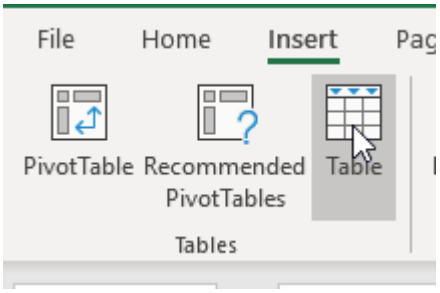
Task: Creating Tables

1 Open the **3 – Working with Tables.xlsx** workbook from your practice files folder

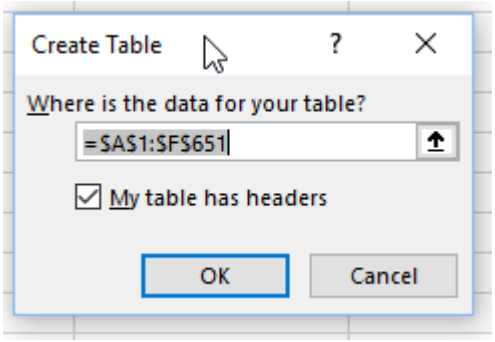
2 Select the **Create Table** worksheet tab

3 Place your selection anywhere within the datalist on the worksheet

4 From the **Insert** ribbon, select **Table**



5 Check the dialog box that appears to ensure that Excel has correctly completed the details. The dialog should look like this:

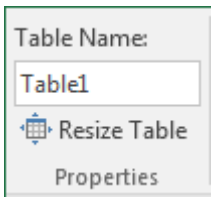


6 Click **OK**

7 Observe the table

b. Changing the Table Name

1 In the **Design** ribbon (If the tab is not displaying, click one of the cells inside your table) click into the box marked **Table Name**



2 Type the new name for your table. The name you choose should have no spaces (use the underscore instead if you like) and should not begin with a number or symbol. Hit **Enter** once you have finished.

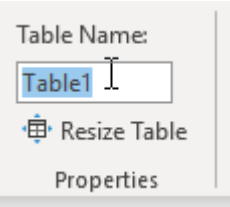
Use the following rules for table names:

- **Use valid characters** Always start a name with a letter, an underscore character (_), or a backslash (****). Use letters, numbers, periods, and underscore characters for the rest of the name.
- **Don't use cell references** Names can't be the same as a cell reference, such as A100 or R100C1.
- **Don't use a space to separate words** Spaces can't be used in the name. You can use the upper case letters, underscore character (_) or full stops (**.**) as word separators. For example, studentName, student_name or student.name
- **Use unique table names**

Task: Rename a Table

1 With the table you have just created.

2 Within the **Design** ribbon, click into the **Table Name:** control



3 Type **petition_data**

c. Adding Data to Tables

Adding data to tables is done in the same way as we add data to standard datalists. However data added to Tables will automatically become part of your table. This offers several advantages to you:

- Formatting of the new data will be done automatically
- Calculations based on Table fields will automatically update to include your new data
- Columns including formulas will be copied into new records
- Charts based on Tables will automatically redraw with your new data included
- Pivot Tables, although requiring a refresh will now include your new data
- AutoFilters will be automatically applied to the Table
- When scrolling the Column Headers, will change from the column letters to the Field names

	Sales Person	Type	Region	Month	Year	Units	Sales
10	Susan	Printer	East	Sep	2008	1	230
11	Susan	Monitor	East	Jan	2008	4	1600
12	Fred	Monitor	North	Sep	2008	12	4800
13	Bill	System Unit	North	Sep	2008	30	900
14	Fred	Mouse	South	Nov	2009	5	225
15	Fred	Keyboard	West	Nov	2008	7	315
16	Bill	Keyboard	East	Apr	2009	23	690

This is not a complete list of the benefits that tables offer.

Task: Adding Data to a Table

1 With the **petition_data** table that you have created:

2 With your selection anywhere within the table, use the **CTRL +** ↓ shortcut

3 Navigate to cell **A650**

4 Input the following data:

York Central,	York	E14001061	England	Rachael Maskell MP	3

York Outer,	York	E14001062	England	Julian Sturdy MP	3

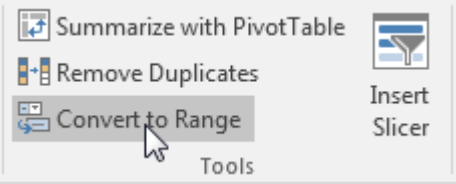
5 Notice the Table expands to include the new data

d. Removing a table

Tables including their data can be deleted like any other data in Excel, but if you need to retain the data but remove the table this can also be done.

1 Click anywhere inside the table

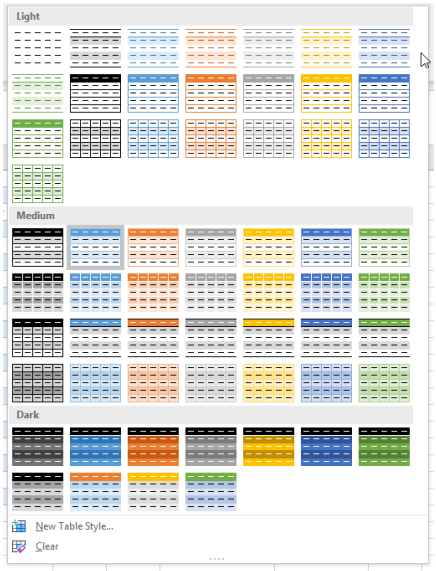
2 From the Design ribbon, click Convert to Range



You will notice that although the table is removed, the formatting remains.

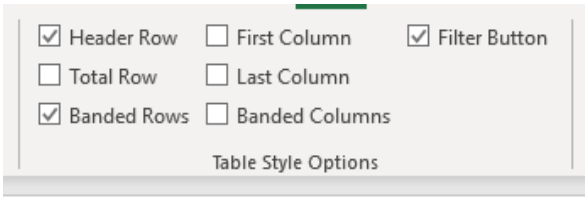
8 Table Styles

You can modify the appearance of a table using Table styles. Unlike manually formatting cells, table styles are automatically applied to the entire table. If further rows or columns are added to the table, the style will also format them.



To change your table style use the **Table Styles** gallery found in the **Design** Ribbon

The **Table Style Options** can be used to tailor the appearance of your table further, You can add emphasis to the First or Last Columns, apply banded rows and even add an automatically calculated **Total Row**



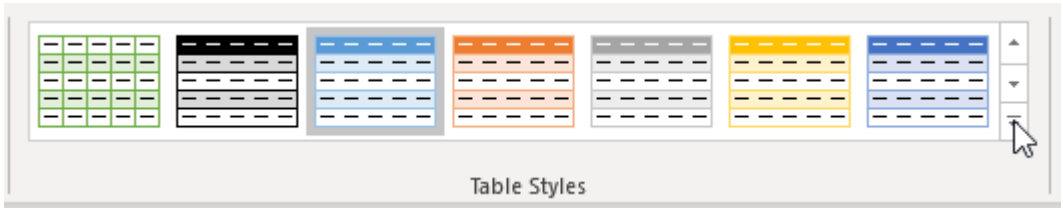
Task: Modify Table Styles

With the **petition_data** table already open:

1 Click anywhere in the table

2 Select the **Design** ribbon

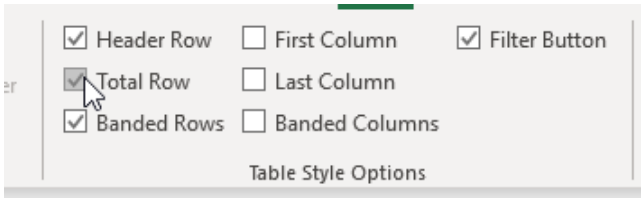
3 Press the expand control to the right of the Table Styles gallery control



4 From the gallery that appears, select a **Table Style** that you like

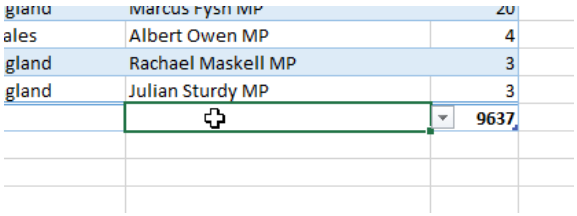
5 From the **Table Style Options**, select different tick boxes and observe the changes to your **Table**

6 Tick the **Total Row**

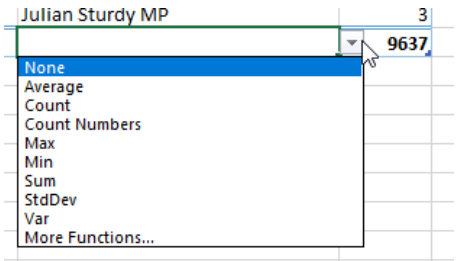


7 In row **652** Observe the **Sign** Column has a total

8 Select the Cell in the Total Row in the MP column



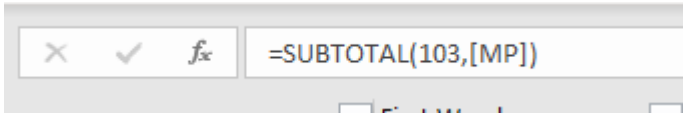
9 Press the drop down button that has appeared to the right of the cell



10 From the menu that has appeared, select **Count**

11 Observe the result

12 Look in the **formula bar** at the formula that Excel has created



Note: The **Subtotal** formula performs a calculation based on the **visible** cells within the MP column. Should a filter be applied to this table, the answers in the **Total** row will be the totals for the filtered results!

9 Using structured references with Excel tables

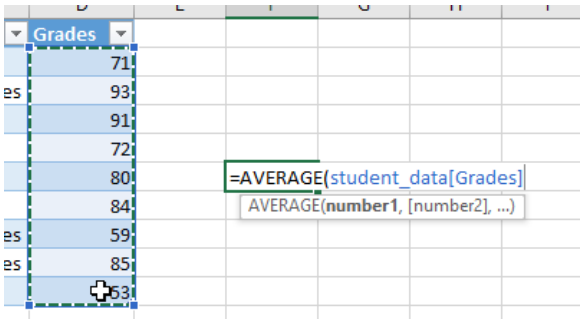
Every Table created in Excel has a unique name, either created by Excel or by you the user. Each **field** (column heading) within that table must also be unique. You can create formulas that use those unique **Table** and **Field** names both within your table or anywhere else within your workbook. These are called **Structured References**

For example:

A calculation using cell references	A calculaton using structured references
=AVERAGE(D2:D36)	=AVERAGE(student_data[Grades])

The cells being referred to by structured references adjust whenever you add or remove data from the table. This makes them an incredibly powerful and flexible way of constructing formulas!

The easy way to create a structured reference when writing a formula is to select the table cells you want to reference instead of typing their cell reference in the formula.



Task: Create a Formula Using Structured References

With the **3 – Working with Tables.xlsx** practice file still open:

1. Open the **Structured References** worksheet
2. Select any cell within the datalist there
3. Use the **CTRL + T** keyboard shortcut to create a table
4. Check the settings in the dialog box that appears
5. Click OK
6. Within the Design ribbon, click the **Table Name:** control
7. Change the name of the table to **stock_list**
8. Use the **Enter** key

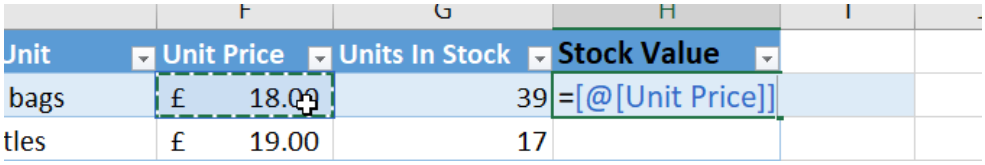
9 Select Cell **H1**

10 Type **Stock Value** and then **Enter**

Notice the new column is created in your table

11 In Cell H2 type **=**

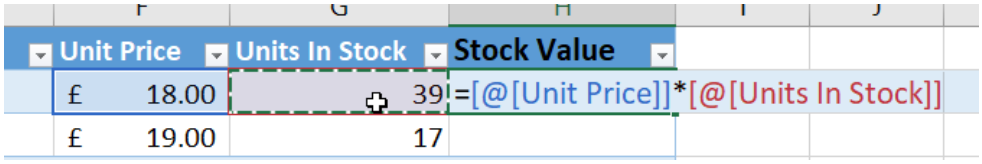
12 Use your mouse to click on cell **F2**



Note the structured cell reference that is created

13 Type ***

14 Use your mouse to click on cell **G2**



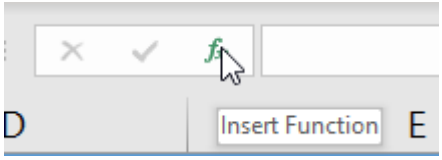
Note the formula that is created

15 Type **Enter**

Excel automatically creates a calculated column and copies the formula down the entire column for you, adjusting it for each row!

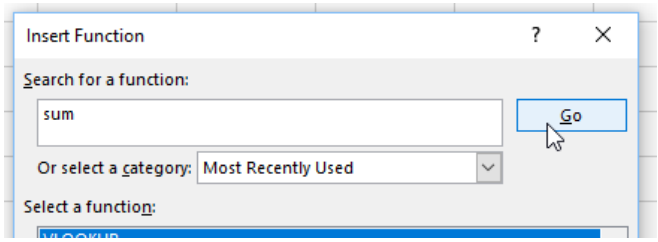
16 Select Cell **J1**

17 In the formula bar, select the **Insert Function** tool **(*fx*)**



18 In the **Search for a function:** box, replace the text with the word **SUM**

19 Click **Go**



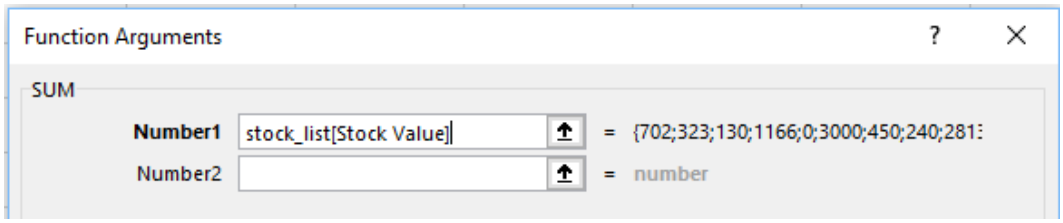
20 Check that **SUM** is highlighted in the **Select a function** list below

21 Click **OK**

22 In the **Function Arguments** dialog box click into the **Number1** field

23 Select **Cell H2**

24 Use the **CTRL + SHIFT +** ↓ keyboard shortcut to select the column



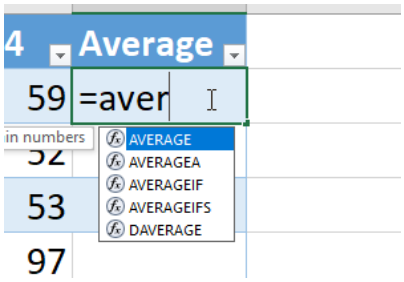
Note the structured reference that has been created

25 Click **OK**

26 Select the **Structured References Range** worksheet

27 Select cell **H2**

28 Type **=Aver**



Notice the intellisense box that appears

29 Click **TAB** on your keyboard

30 Select cells **D2 to G2**

31 Type **)**

32 Hit the **ENTER** key

10 Sorting data

a. Sort order

Excel uses specific sort orders to arrange data according to the value, not the format, of the data. In an ascending sort, this is the order -

- Numbers are sorted from the smallest negative number to the largest positive number
- Dates are sorted from the earliest date to the latest date
- Text, and text that includes numbers, is sorted in this order:
- 0 1 2 3 4 5 6 7 8 9 ' - (space) ! " # $ % & ( ) * , . / : ; ? @ [\ ] ^ _ ` { | } ~ + < = > A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
- In logical values, FALSE is placed before TRUE
- All error values are equal
- Blanks are always placed last

In a descending sort, Excel reverses the order of everything except blank cells, which are always sorted last.

b. Quick sort on one field

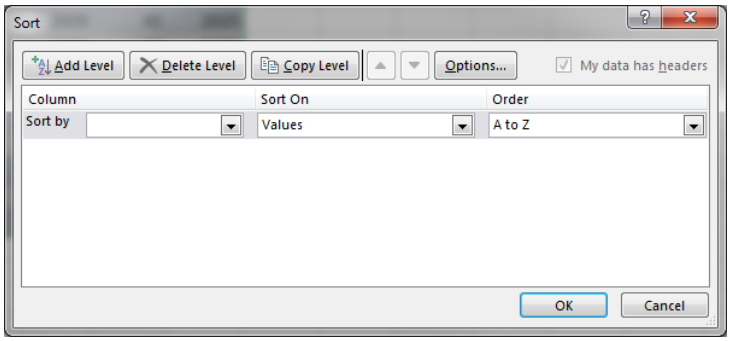
Sit the cursor anywhere in the relevant field data, choose the Data tab, Sort & Filter group and click either  or 

 You can also access single level sorting whilst working with autofilter on (explained on Page 24)

c. Sorting on more than one field

Sit your cursor anywhere in the list -

1 Choose **Data** tab, **Sort & Filter** group, **Sort** button 



2 Excel automatically puts the first field name in the **Sort by** box. Choose the field name to perform the first key field sort on, from the drop down list

3 From **Sort *On*** you can select Values, Cell Colour, Font Colour or Cell Icon

4 From **Order** click either **A to Z** or **Z to A**

5 If required, select the second key field to sort on. For example, if surname and forename fields are separate in your list you may wish to sort by surname and then have the forenames sorted within that listing in order also

6 Where you have the field names at the top of the list you are sorting, you must ensure that *My data has headers* is selected at the top of the dialogue box

7 Click **OK**

11 Filtering data

By filtering a list, you can display just the rows that meet the criteria you specify. For example, in a list of salespeople and value of goods sold, you can filter out the names of the salespeople who sold more than £5,000 worth of goods. There are two ways to filter a list in Excel - using the Filter command or the Advanced Filter command, both found on the Data tab.

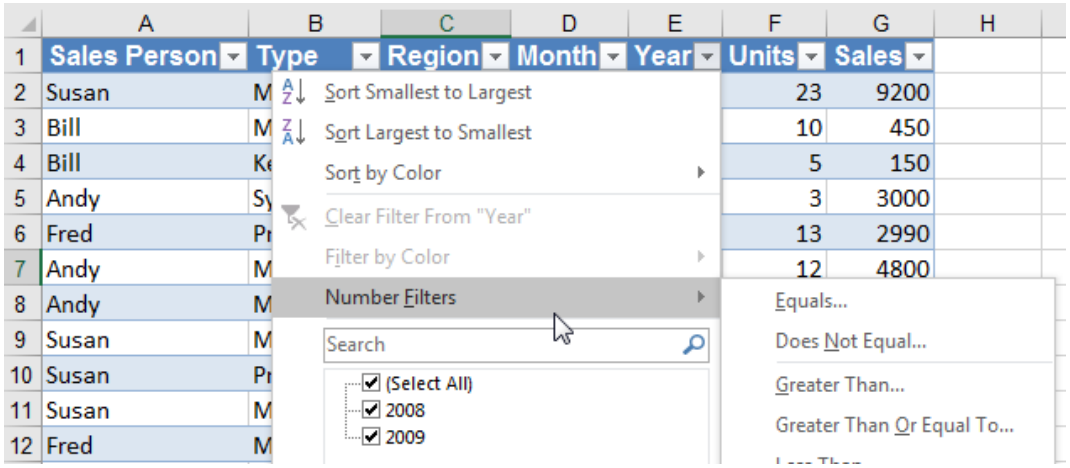
When you filter a list, if you do not wish to see some of the columns, select them, right click and choose *Hide*.

a. Using Autofilter

1 Choose **Data** tab

2 On **Sort & Filter** group click 

3 The field names will then appear with drop down arrows beside them -



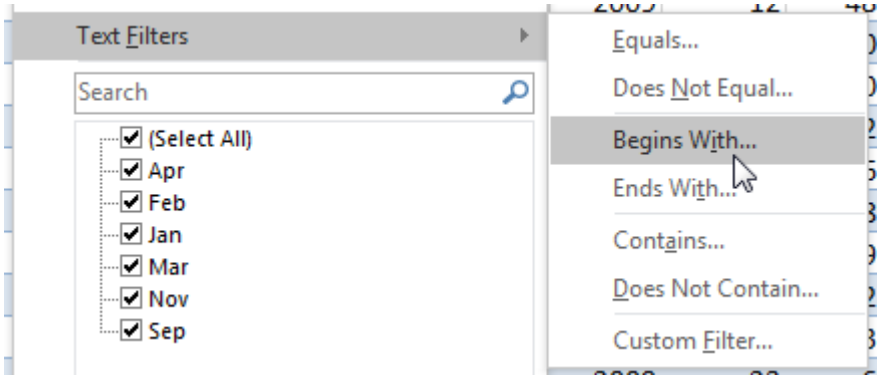
If you click on the arrow beside a field name you wish to filter records from, you will see listed –

- *Sort A to Z* or *Z to A,* for textual columns and
- *Sort smallest to largest* or *largest to smallest* for numerical content or *Sort by Colour*

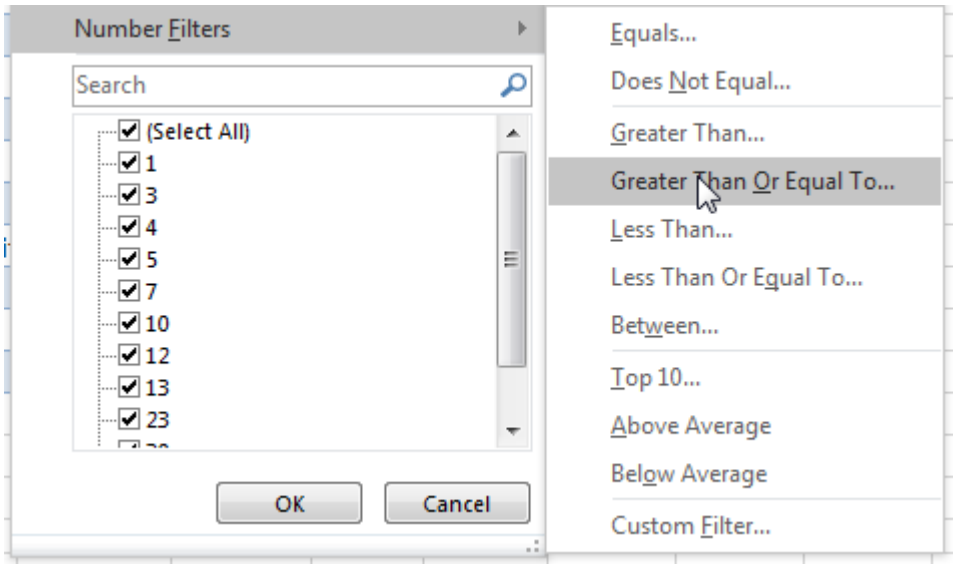
4 At the bottom, all individual values for that field are checked

5 To filter on a specific entry for a field, de-select all and only select the entry you require

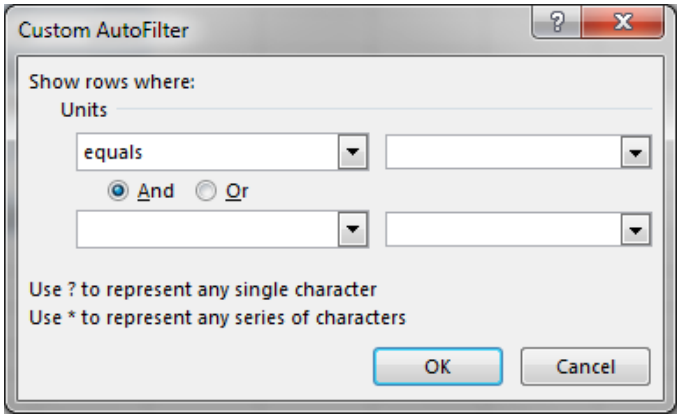
6 Depending on whether the column (field) content is textual or numerical you will also see –



Or



7 These options allow you to perform filters on your data, using a selected comparison operator itemised on each list, or perform a custom filter –



wildcard options	?	single character
	*	any series of characters

8 To display rows that meet two conditions, enter the comparison operator, value and then click the **AND** option and enter the next comparison operator and value

9 To display rows that meet either one condition or another, enter the comparison operator, value and then click the **OR** option and enter the next comparison operator and value

10 Once you click **OK** the list will only display those records adhering to the selected comparison criteria. The filtered row (record) numbers will be displayed at the left in blue, rather than the usual black –

	A	B	C	D	E	F	G
1	Sales Person	Type	Region	Month	Year	Units	Sales
2	Susan	Monitor	West	Sep	2008	23	9200
3	Bill	Mouse	West	Jan	2008	10	450
4	Bill	Keyboard	North	Jan	2008	5	150
5	Andy	System Unit	North	Mar	2008	3	3000
6	Fred	Printer	South	Mar	2008	13	2990

and the field you filtered on will show the filter icon - 

Note: When ever you insert a Table in Excel, a filter will be applied automatically to the table.

b. Returning to All Records

Once you have filtered records and wish to return to viewing all records, you should click each of the filter icon arrows displayed and choose **Clear Filter From** *"xxx"* (where "xxx" is the field name)

c. Switching off Autofilter

1 Choose **Data** tab

2 On the **Sort & Filter** group click **Filter** button again to switch off

This can also be used to remove the filters from numerous fields

Task: Using a simple Filter

1 Open the **4 – Filters.xlsx** practice file

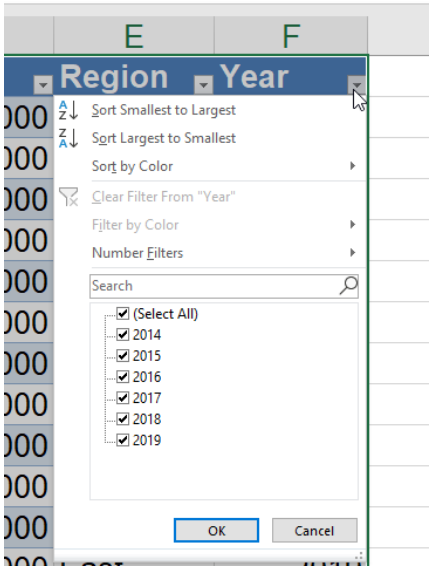
2 Select the **Simple Filter** worksheet

3 Select any cell within the datalist

4 Use the **CTRL + T** keyboard shortcut to create a table

5 Click **OK** after checking the **Insert Table** dialog box is correct

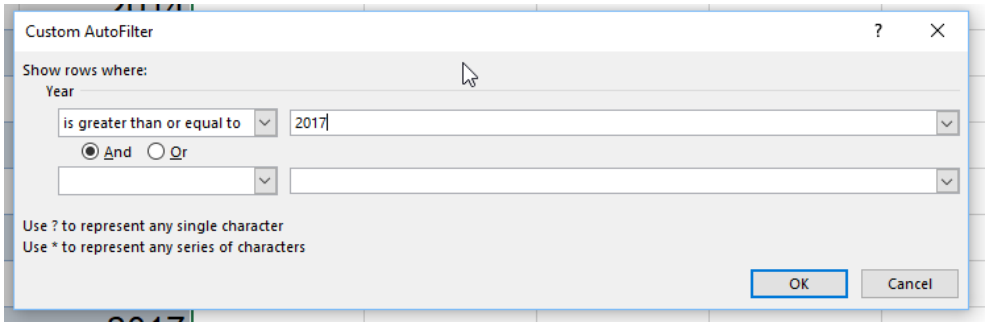
6 Select the **Year** filter control



7 Select **Number Filters**

8 Select Greater Than or Equal To

9 In the first row type 2017 in the empty field



10 Click **OK**

11 Select the **Car Type** Filter control

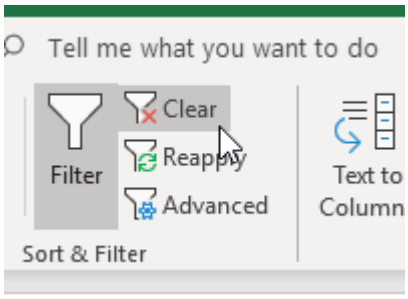
12 Untick **Select All**

13 Tick **3 Series**

14 Click **OK**

15 Select the Data Ribbon

16 From the **Sort & Filter** group select **Clear**

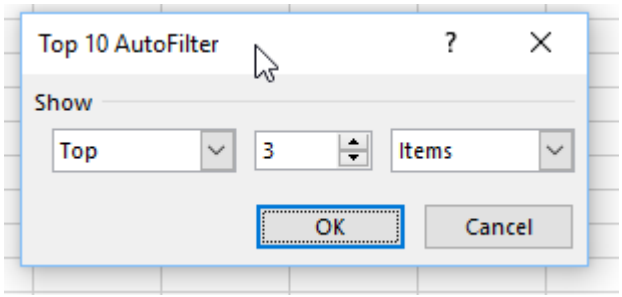


17 Select the **Sales** filter control

18 Select **Number Filters**

19 Select **Top 10**

20 Edit the dialog box to ask for the top 3 items



21 Observe the result.

Why is Excel returning more than 3 search results?

d. Using Advanced Filter

The Advanced Filter command filters your list, as Autofilter does, but it does not display arrows next to the field names for criteria selection. Instead, you type the criteria in a criteria range on your worksheet. Use the Advanced Filter command with criteria in two or more columns, with three or more conditions in a single column, or to apply calculated values as your criteria.

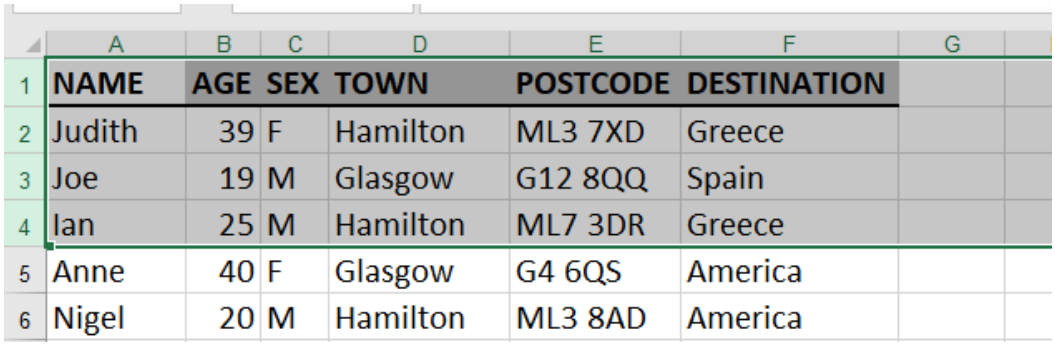
To extract filtered records you need to set up a criteria range and an extract range somewhere on the same sheet as the list.

Task: Use an Advanced Filter

With the **4 – Filters.xlsx** practice file currently open:

1 Select the **Advanced Filter** worksheet

2 Select the first 4 rows of your list



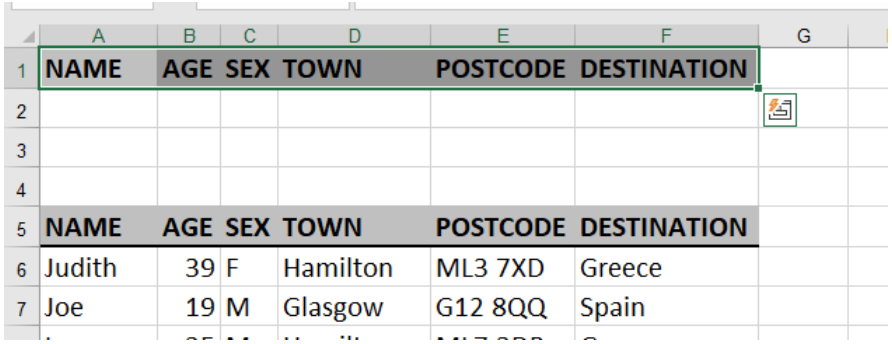
	A	B	C	D	E	F	G
1	NAME	AGE	SEX	TOWN	POSTCODE	DESTINATION	
2	Judith	39	F	Hamilton	ML3 7XD	Greece	
3	Joe	19	M	Glasgow	G12 8QQ	Spain	
4	Ian	25	M	Hamilton	ML7 3DR	Greece	
5	Anne	40	F	Glasgow	G4 6QS	America	
6	Nigel	20	M	Hamilton	ML3 8AD	America	

3 **Right click** on the selected rows and choose **Insert**

4 Select cell **A5**

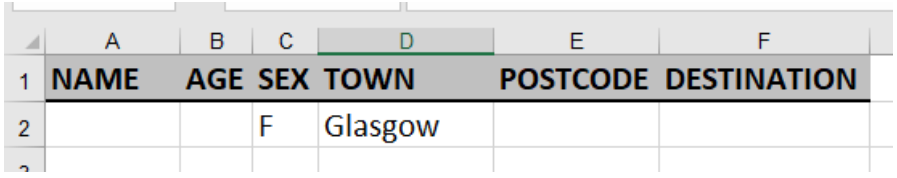
5 Use the **CTRL + SHIFT +** → keyboard shortcut to select the headers

6 Move your mouse to the thick green line and CTRL drag the selection (copy them) to row 1 (this is your criteria area)



	A	B	C	D	E	F	G
1	NAME	AGE	SEX	TOWN	POSTCODE	DESTINATION	
2							
3							
4							
5	NAME	AGE	SEX	TOWN	POSTCODE	DESTINATION	
6	Judith	39	F	Hamilton	ML3 7XD	Greece	
7	Joe	19	M	Glasgow	G12 8QQ	Spain	

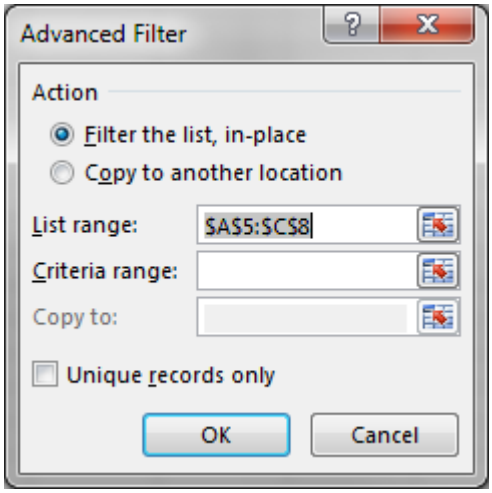
7 Below the criteria field names type the relevant criteria:



	A	B	C	D	E	F
1	NAME	AGE	SEX	TOWN	POSTCODE	DESTINATION
2			F	Glasgow		

8 Click cell **D7**

9 Choose **Data** tab, **Sort & Filter** group, **Advanced** 



10 Click **Copy to Another Location**

11 Where necessary select the relevant cells on your worksheet to enter the reference information into either the **List range**, **Criteria range** or **Copy to** boxes

12 Click **OK** to extract the records (which meet the criteria set up in the criteria range) to the extract area –

e. Examples of criteria for Advanced Filter

To find records that contain an exact value, type the text, number, date, or logical value in the cell below the criteria label. For example, if you type ML3 7XD below a Postcode label in the criteria range, Excel displays only rows that contain the postcode value ML3 7XD.

When you use text as criteria, Excel finds all items that begin with that text. For example, if you type the text 'Ju' as a criterion under a Name field, Excel finds Judith, Julie and Justin. To match only the specified text, type the formula -

="=text"

where *text* is the text you want to match, eg ="=Jude"

To find text values that share some characters but not others, use a wildcard character. A wildcard character represents one or more unspecified characters,

wildcard options	?	single character
	*	any series of characters

eg -

Sm?th finds Smith and Smyth

*gow finds Linlithgow, Lesmahagow and Glasgow

fy91~? finds fy91?
a ~ (tilde) followed by ?, *, or ~ finds an actual question mark, asterisk, or tilde

To specify multiple criteria for different columns, enter all criteria in the same row of the criteria range

eg -

Age	Sex	Destination
>40	F	Greece

will display only rows where women, over the age of 40 travelled to Greece, whereas -

eg -

Age	Sex	Destination
>40		
	F	
		Greece

will display rows that contain anyone over 40 in the age column, or any subjects who are women from the sex column, or anyone who has travelled to Greece

To specify AND/OR relationships in the same criteria range, type the criteria in separate rows

eg.

Age	Sex
<20	F
>40	M

displays the rows that contain women younger than 20 or the rows of men over 40

Destination
Greece
Spain
America

will display rows that contain people who have travelled to Greece, Spain or America

Exercises

1 Practical: Populating a datalist

1 Open **Practical 1.xlsx**

2 In the sheet named **Practical 1**, type the following -

3 Make the headings 12 point, bold

	A	B	C	D	E	F
1	**Sales Person**	**Type**	**Region**	**Month**	**Units**	**Sales**
2	Susan	Monitor	West	Sep	23	9200
3	Bill	Mouse	West	Jan	10	450
4	Bill	Keyboard	North	Jan	5	150
5	Andy	System Unit	North	Mar	3	3000

Note - autocomplete cell entry activates as you type. If the system senses you are about to repeat an item previously typed in a column, it will offer to complete the entry. To accept, simply move to the next cell you want to type in, by whatever means you prefer (cursor right, tab, mouse). If the entry is to be different from what comes up, keep typing.

4 Type the following records using the Data Form (see page 5 of the notes for how to add the Data Form button to the Quick Access Toolbar), clicking New to get a blank record and using the TAB key to move from field to field -

6	Fred	Printer	South	Mar	13	2990
7	Andy	Monitor	West	Mar	12	4800
8	Andy	Mouse	East	Mar	45	2025
9	Susan	Mouse	South	Feb	23	1035

5 Once complete, back at the worksheet, select the Units column and insert a new column before it

6 Head it up Year and type the following entries, either manually or via the form

Year
2008
2008
2008
2008
2008
2009
2009
2009

7 Now, add the remaining records by ALT dragging them from the sheet named Extras - Practical 1

8 Put your name in the Header area of the sheet and the page number in the Footer and print the sheet for your own use in the following practicals, then re-save the book

2 Practical: Sorting Data

1 In the **Practical 2.xlsx** book perform the following sorts:

Single level by
- Sales in ascending order

Multi-level by
- Sales Person
- Year
- Region

all in ascending order

Multi-level by
- Type
- Units
- Sales

all in ascending order

2 Now, perform the following autofilters, returning to show **ALL** records after each filter -

- Records showing **Monitors** sold
- Records showing **Susan's** sales
- Records showing **2009's** sales
- Records showing **Sep 2008's** sales
- Records showing **Keyboard** sales in the **West**

3 Once you have done all filters, switch Autofilter off and re-save the book

3 Practical: Custom Autofilter

1 In the **Practical 3.xlsx** book perform the following custom autofilters, returning to show **ALL** records after each filter:

- Records showing the top **3 Sales**
- Records showing **Units** sold between **10** and **20** inclusive
- Records showing **Sales** of **3,000** or more, **or 300** or less
- Records showing the **bottom 15%** of **Sales**
- Records showing **below average Sales** for **2008**

2 Again, once you have done all filters, switch Autofilter off

3 re-save the book

4 Practical: Subtotals

1 In the **Practical 4.xlsx** book sort the data into ascending order by:

- Region
- Sales Person

2 On the sorted data produce a sub-total table showing **Total Sales** at each change in **Region**

3 Without removing the first sub-total display, add into the table a sub-total showing Average Units sold in each Region

4 Remove all sub-totals on this list, and re-sort the data into ascending order by -

- Sales Person
- Type

5 Produce a sub-total table showing Total Sales for each Sales Person

6 Add into this table Total Units sold by each Sales Person

7 Remove all sub-totals

5 Practical: Advanced Filter

1. In the **Practical 5.xlsx** book set it up to perform an advanced filter
2. Put the **Sales Person** and **Sales** field names in the **Copy to** (Extract) area
3. Filter out -

- **A** Sales in the **West** in **January 2008**
- **B** **Susan's** sales of **Monitors** or **Printers** in **2008**

7 Useful Shortcut keys

Using keyboard shortcuts can help you become more efficient when creating documents in Microsoft applications. Most keyboard shortcuts require you to use two or more keys at the same time. To use a keyboard shortcut first press and hold down the modifier key or keys (i.e. SHIFT, CTRL, ALT) and then press the corresponding standard key on your keyboard.

Function	**Shortcut**
Go to "Tell me what you want to do"	ALT+Q
Open	CTRL+O
Save	CTRL+S
Close	CTRL+W
Cut	CTRL+X
Copy	CTRL+C
Paste	CTRL+V
Select all	CTRL+A
Bold	CTRL+B
Italic	CTRL+I
Underline	CTRL+U
Cancel	Esc
Undo	CTRL+Z
Re-do	CTRL+Y
Left/Right Arrow	Move one cell to the left or right
Ctrl+Left/Right Arrow	Move to the farthest cell left or right in the row
Up/Down Arrow	Move one cell up or down
Ctrl+Up/Down Arrow	Move to the top or bottom cell in the column
Tab	Go to the next cell
Shift+Tab	Go to the previous cell
Ctrl+End	Go to the most bottom right used cell
F5	Go to any cell by pressing F5 and typing the cell coordinate or cell name.
Home	Go to the leftmost cell in the current row (or go to the beginning of the cell if editing a cell)
Ctrl+Home	Move to the beginning of a worksheet
Page Up/Down	Move one screen up or down in a worksheet
Alt+Page Up/Down	Move one screen to the right or left in a worksheet
Ctrl+Page Up/Down	Move to the previous or next worksheet
Shift+Left/Right Arrow	Extend the cell selection to the left or right
Shift+Space	Select the entire row
Ctrl+Space	Select the entire column
Ctrl+Shift+Space	Select the entire worksheet