Spreadsheets: Organising and Displaying Data

IT Learning Programme

How to Use this User Guide

This handbook accompanies the taught sessions for the course. Each section contains a brief overview of a topic for your reference and then one or more exercises.

Exercises are arranged as follows:

- A title and brief overview of the tasks to be carried out;
- A numbered set of tasks, together with a brief description of each;
- A numbered set of detailed steps that will achieve each task.

Some exercises, particularly those within the same section, assume that you have completed earlier exercises. Your teacher will direct you to the location of files that are needed for the exercises. If you have any problems with the text or the exercises, please ask the teacher or one of the demonstrators for help.

A number of conventions are used to help you to be clear about what you need to do in each step of a task.

In general, the word press indicates you need to press a key on the keyboard. Click, choose or select refer to using the mouse and clicking on items on the screen.

Names of keys on the keyboard, for example the Enter (or Return) key are shown like this ENTER.

Multiple key names linked by a + (for example, CTRL+Z) indicate that the first key should be held down while the remaining keys are pressed; all keys can then be released together.

Words and commands typed in by the user are shown `like this`.

Labels and titles on the screen are shown **like this**.

Drop-down menu options are indicated by the name of the options separated by a vertical bar, for example **Home** tab **|Copy**. In this example you need to select the option **Copy** from the **Home** tab from the Ribbon. To do this, choose the **Home** tab from the Ribbon; move the cursor to **Copy** button; when **Copy** is highlighted, click the mouse button again.

A button to be clicked will look **like this**

The names of software packages are identified *like this*, and the names of files to be used **like this**.

Software Used

Excel 2010
Windows 7

Files Used

Data1.xlsx
Colour Filters.xlsx
Fallrain.xlsx
Histograms.xlsx
Ohms Law.xlsx
xy_scatter2.xlsx
Crystall Ball Shares.xlsx
Charts.xlsx
Class Attendance
Regional Scores.xlsx

Revision Information

Version	Date	Author	Changes made
1.0	15 September 2011	Ian Miller	Office 2010
1.1	19 September 2011	Ian Miller	Added Sparkline charts
1.2	5th June 2014	Tanya Smith	Combine Charts and filtering, subtotals and consolidation of data
2.0	31 July 2015	Traci Huggins	Updated for Office 2013

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Contents

Exercises

1 Introduction

Welcome to the course *Spreadsheets: Organising and Displaying Data*.

This booklet accompanies the course delivered by Oxford University IT Services, IT Learning Programme. Although the exercises are clearly explained so that you can work through them yourselves, you will find that it will help if you also attend the taught session where you can get advice from the teachers, demonstrators and even each other!

If at any time you are not clear about any aspect of the course, please make sure you ask your teacher or demonstrator for some help. If you are away from the class, you can get help by email from your teacher or from help@it.ox.ac.uk.

1.1. What you should already know

We expect you to have a level of experience in *Excel* that would be gained from attending the *Office: Fundamentals* course.

You should be able to open and navigate around a workbook using the mouse and scrollbars, use the help function, add data to cells, and select and amend such data. You should also be able to save a worksheet.

The computer network in IT Services may differ slightly from that which you are used to in your College or Department; if you are confused by the differences, ask for help from the teacher or demonstrators.

By the way, did we say that you can ask for help from the teachers or demonstrators ☺!

1.2. What you will learn

At the end of this session you will have learned how to work using

You will learn some advanced charting techniques including plotting non-adjacent areas and inserting new data into an existing chart. You will also learn how to create a mixed type chart using a secondary axis.

You will learn how to create histograms that show the distribution of data: histograms are commonly used to summarise data

Topics covered are:

- Working with ranges and tables of data
- Filtering your data
- Subtotal and group your data
- Charting non-adjacent worksheet areas and charting filtered data
- Working with mixed chart types
- Formatting charts
- Charting on a secondary axis
- Adding data series
- Creating histograms and sparklines

These notes deal with *Excel 2013*. Having worked through these notes, you should also be able to adapt to earlier versions (for example, *Excel 2010*), and also to later

releases, since most of the basic principles hold true regardless of the version of the software.

1.3. What is *Excel*?

Excel 2013 is part of the *Microsoft Office 2013* package. Spreadsheets allow you to present and analyse data in a wide variety of ways and Microsoft *Excel* is perhaps the world's most popular spreadsheet application.

1.4. Where can I get a copy?

If you have a copy of Microsoft Office 2013, then you already have a copy of *Excel 2013*. If you are unable to find it on your computer, it may not have been installed and you should talk to your IT support contact (or the IT Services Help desk).

If you are a member of staff, you can obtain a copy of *Microsoft Office 2013* from the IT Services shop. Students can obtain a Microsoft Student Licence, but this must be bought through a Microsoft Authorised Education Reseller; the IT Services shop can direct you to a suitable reseller.

2 Ranges and Tables in Excel

2.1. Working with a range

2.1.1. What is a range?

It is likely that until now you have been working with a range or ranges of data in Excel. A range consists of a group of cells which are grouped together, they are usually rectangular in shape. For example cells A1, A2, A3, B1, B2, B3 the range of these cells would be A1:B3, see Figure 1

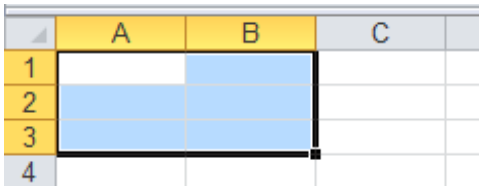


Figure 1: Range of cells

Ranges and named ranges only expand or contract when rows are inserted or deleted from the middle of the data and not when added to the end. Data remains static.

Any formulas or charts linked to a range or named range would need to be adjusted to accommodate future changes.

2.2. Working with a table

2.2.1. Introducing tables

This section introduces you to a special form of tabular data, similar to a database, which in Excel is called a table. In earlier versions of Excel they were known as lists; tables are the evolution of that feature with a few added benefits.

We will cover basic procedures to manipulate, manage, sort, summarise and otherwise analyse data held in the table.

2.2.2. What is a table?

Tables were introduced in Excel 2007 and 2010. They are a new way of working with tabular data. They are particularly useful when working with data which expands and contracts over time, also known as 'dynamic data'. The differences are that tables have additional functionality and are more helpful in appearance than ranges.

By converting your range of data to a table you will ensure that when further data is added it will still include it as part of the data set. In contrast to where ranges and named ranges only expand or contract when rows are inserted or deleted from the middle of the data and not when added to the end, hence why tables are considered a preferred option when working with an expanding data set.

A table comprises a series of columns and rows containing related data, such as a set of client names and addresses. A table can be used as a database, in which rows are records and columns are fields. By default, tables display rows in alternating colours to distinguish data. The first row (header row) of the table usually contains the column labels and is differentiated in some way. For example, the headings might be emboldened or set in a different font and filter arrows appear, see Figure 2 below

	A	B	C	D
1	Surname	First Name	House Number	Post Code
2	Smith	Andrew	1	OX1 2NJ
3	Jones	John	3	OX4 2YR

Figure 2: Table view 1

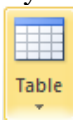
Excel makes reference to headings to summarise data in tables and when rows of data are longer than the page you can see the headings move to replace the column letters, see Figure 3

	Surname	First Name	House Number	Post Code
4	Smith	Andrew	5	OX1 2NJ
5	Jones	John	7	OX4 2YR
6	Belcher	Sam	9	OX1 2NJ
7	Mitchell	Paul	11	OX4 2YR

Figure 3: Table view 2

The data contained in a table may consist of either text or values (typed directly in by the user) or calculated values (formulas). The data is arranged in rows, otherwise known as records.

2.2.3. Convert your range to a table

To create a table in Excel 2007 or 2010, select any cell within your range of tabular data. Select the **Insert** tab and then select the 

icon from the **Tables** group. The following dialog box will appear, see Figure 4.

Alternatively using the keyboard select <CTRL>+<T>

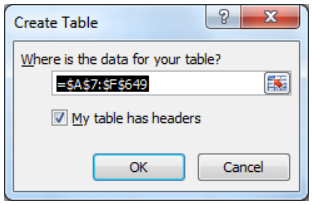


Figure 4: Create Table dialog box

Select the **My table has headers** check box if your selection includes headers. Select **OK**

A table has now been created. The appearance of your range of data will change to alternate coloured column and filter arrows will appear in the header row, see Figure 3 and Figure 4 above.

At the top of your screen a new ribbon option will also have appeared named **Table Tools,Design**.

2.2.4. Format your table

Once you have formatted your data as a table, you can change the appearance using **Table Styles**.

Click anywhere within your table and from the **Table Tools Design** tab select a style from the **Table Styles** tab. See Figure 5

Figure 5: Table Styles tab

2.2.5. Add a total row

Tables have a built in facility to add a total row.

Click anywhere inside the table and from the **Table Tools Design** tab select **Table Styles Options**. Point and click in the box to insert a tick by **Total Row** See Figure 6

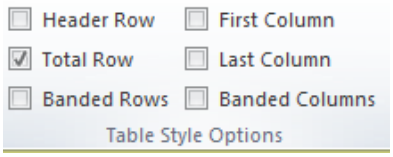


Figure 6: Table Style Options

Totals will now appear, by default in the right-most column. The default calculation for number values will be SUM and for text values COUNT.

To change the total from SUM to a different option, click in a cell in the total row. A drop down arrow will appear. Select an alternative calculation function from the list. See Figure 7

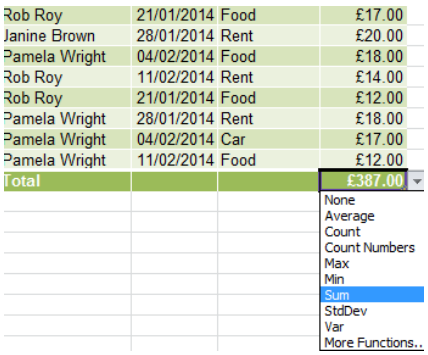


Figure 7: Table totals

2.2.6. Convert a table back to a range

It is advisable that before converting a table back into a range the table formatting is removed.

To achieve this click anywhere inside the table.

Click **Table Tools | Design | Table Styles | More | Light**. See Figure 8

Figure 8: Remove Table Styles

To then convert your table back to a range, click anywhere inside the table and from the **Table Tools Design** tab select **Tools | Convert to Range**. See Figure 9

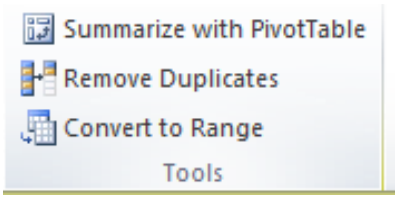


Figure 9: Convert to Range

Exercise 1: Convert a Range of data to a Table

Now look at this exercise (page 53)

3 Filtering Data To Show A Subset

Rather than working with the entire list, you may wish to work with a subset. Excel provides a simple way to show a subset of data in a list through the **Data | Filter** options. When this is selected, drop-down arrows appear at each column label. The AutoFilter feature is now active, and criteria can be specified (by selecting from the suggested available values) to produce a subset of the list.

Remember if you have already converted your range to a table the filter arrows will be available to you without needing to add them from the Data menu. All other filter options will then be the same as working with a range.

You may like to bear in mind the following points when filtering a list.

- Filtering the list finds a subset of the data without moving or sorting it.
- Rows not matching the filter are hidden.
- A list may be filtered according to the values contained in certain columns. For example, you may like to view records whose **Company Name** is Hardcopy Stores
- A list may be progressively filtered to produce a smaller subset each time, until the final subset is obtained. For example, you may like to view records whose **Company Name** is PerfectWord and whose **Amount** is greater than £2500.

3.1. AutoFilter

To use Excel's AutoFilter feature to filter your data, place the cell pointer within the list and choose **Data | Sort & Filter | Filter**.

Excel analyses your list and adds drop-down arrows to the field names in the header row. By selecting a drop down arrow above a field the filter list options will change according to the data type in the field you have selected.

Click the drop down arrow in the field of date you would like to filter. Uncheck the **Select All** check box and check a box or boxes you would like to filter on. Click the **OK** button.

Alternatively use the filters made available to you according to data type in the field you are filtering on. The AutoFilter options available are **Text filters**, **Number filters** or **Date filters**. See Figure 10**Error! Reference source not found.**

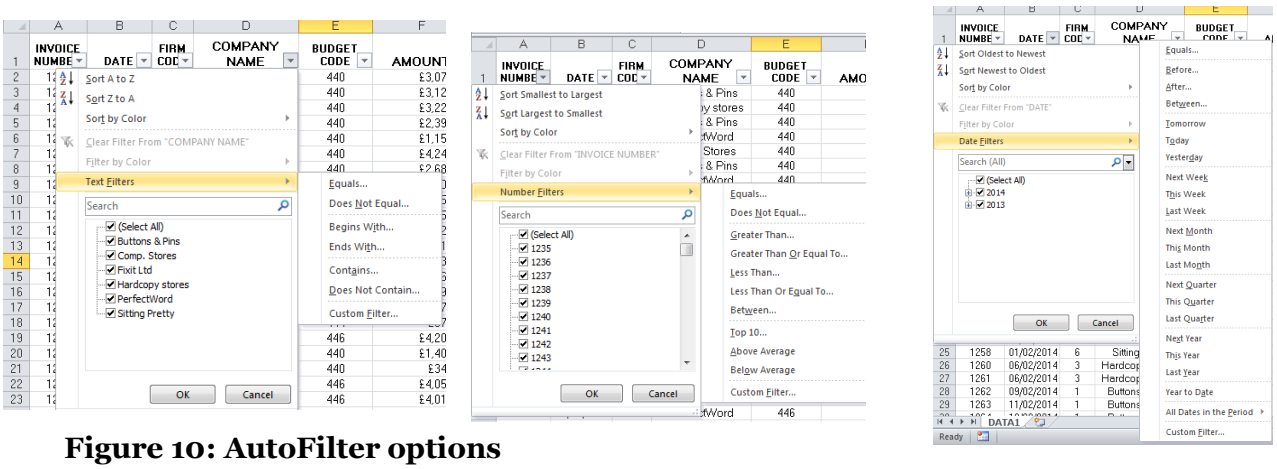


Figure 10: AutoFilter options

On selecting an option available from the lists in Figure 10 a **Custom AutoFilter** dialog box will made available for you to type in your criteria. See Figure 11

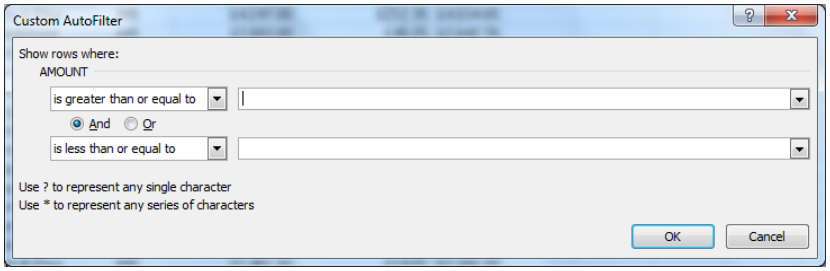


Figure 11: Custom AutoFilter dialog box

Alternatively if no relevant option is available on the AutoFilter facility then select Custom Filter from the AutoFilter dropdown menu, which is located at the bottom data type autofilter submenu. See Figure 10

3.2. Filter by selection

There is a time saver facility which is available for filtering your data and this is called filter by selection. With two clicks you can filter your data.

Click into the field that you would like to filter and locate the value that you would like to filter on, for example **Hardcopy Stores**, right click and select **Filter | Filter by Selected Cell's Value**. See Figure 12

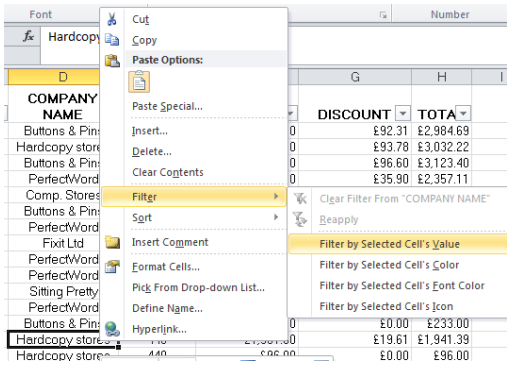


Figure 12: Filter by Selected Cell's Value

3.3. Top 10 AutoFilter

This facility is available on **Number Filters**. The name is slightly misleading however as it will filter both the highest and lowest or varying numbers of either items or percentage in the selected field.

Click the drop down arrow to filter a number field, select **Number Filters** from the list and then select **Top 10** on the fly out menu. The below dialog box will appear. See Figure 13

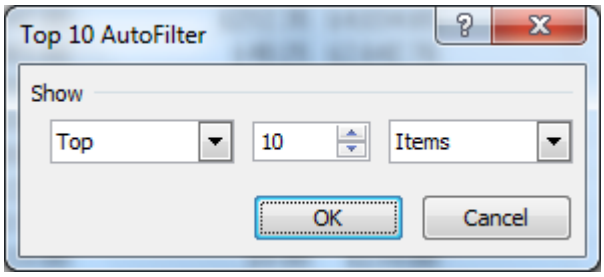


Figure 13: Top 10 AutoFilter

Select Top or Bottom from the Show list, then select the number you would like to display and select either Items or Percent from the final list. Click on OK

Exercises 2 & 3: Using AutoFilter, Filter by Selection

Now look at this exercise (page 56 & 61)

3.4. Filter by colour

If you have applied different cell or font colours or a conditional format, you can filter by the colours in your data.

To filter by colour, click into the data select **Data |Sort and Filter,**

The AutoFilter feature is now active and drop-down arrows will appear above the column headers.

Select the drop down arrow for the column you want to filter by.

Select **Filter by Colour** then select either **Filter by Cell Colour** or **Filter by Font Colour.**

The types of colour options made available will depend on the types of formats you have applied. See Figure 14

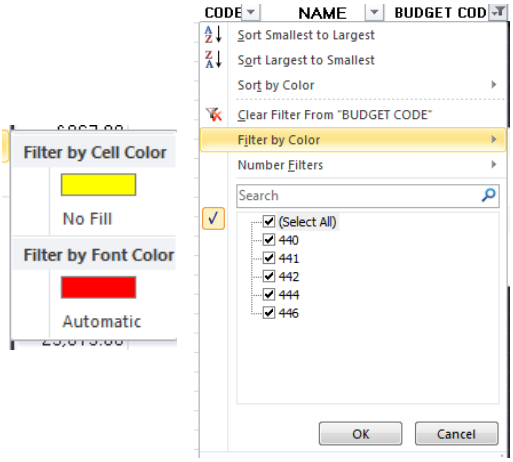


Figure 14: Filter by Colour

Exercise 4: Filter by Colour

Now look at this exercise (page 63)

3.5. Clear filters

When a column of data has been filtered a filter icon will appear above the column header. See Figure 15. To clear the filters from

Figure 15: Filter icon

To clear filters from a particular field select the column filter heading and select **Clear Filter From "Amount"** (Field Name). See Figure 16

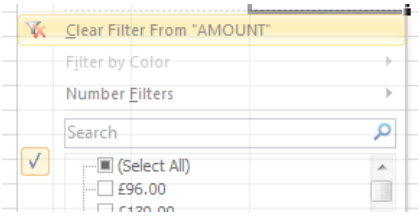


Figure 16: Clear Filter from column

To clear all the filters which have been applied, select **Data | Sort & Filter | Clear** from the ribbon. See Figure 17

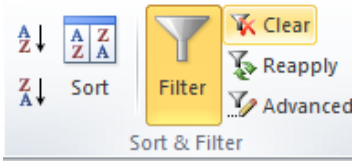


Figure 17: Clear all filters

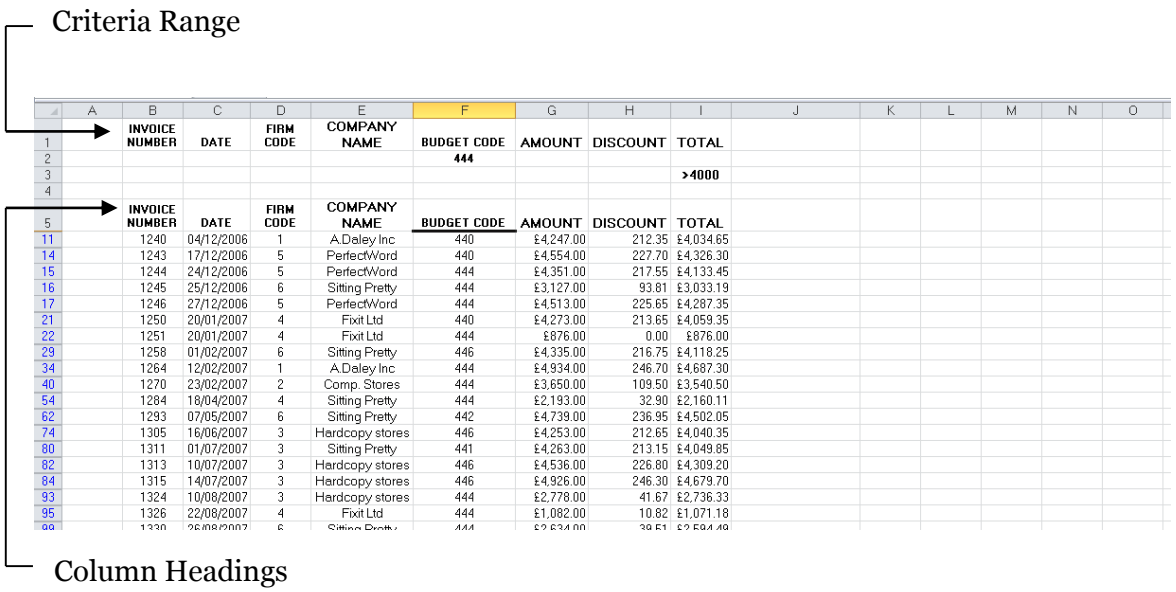
3.6. Apply an advanced filter

The advanced filter command allows you to filter the list using complex criteria. This command does not display drop down filter arrows in each column label. Instead, search values have to be typed into a *criteria range*. Also, filtered records (that is, those records matching the search criteria specified in the criteria range) may be copied to a new location.

3.6.1. Setting up a criteria range

The criteria range is a separate area of the worksheet containing your search criteria. It is usual to place the criteria range above the list but this is not compulsory. Do not place the criteria range to left or right of the list as it may be hidden when the list is filtered.

The top row of the criteria range contains the names of columns in the list that you wish to search. The search values appear immediately underneath the column name. A completely blank row in the criteria range will cause no records to be filtered. A common method of inputting criteria headings is to copy the original column headings, thus avoiding typing mistakes. See Figure 18



	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1		INVOICE NUMBER	DATE	FIRM CODE	COMPANY NAME	BUDGET CODE	AMOUNT	DISCOUNT	TOTAL						
2						444									
3									>4000						
4															
5		INVOICE NUMBER	DATE	FIRM CODE	COMPANY NAME	BUDGET CODE	AMOUNT	DISCOUNT	TOTAL						
11		1240	04/12/2006	1	A.Daley Inc	440	£4,247.00	212.35	£4,034.65						
14		1243	17/12/2006	5	PerfectWord	440	£4,554.00	227.70	£4,326.30						
15		1244	24/12/2006	5	PerfectWord	444	£4,351.00	217.55	£4,133.45						
16		1245	25/12/2006	6	Sitting Pretty	444	£3,127.00	93.81	£3,033.19						
17		1246	27/12/2006	5	PerfectWord	444	£4,513.00	225.65	£4,287.35						
21		1250	20/01/2007	4	Fixit Ltd	440	£4,273.00	213.65	£4,059.35						
22		1251	20/01/2007	4	Fixit Ltd	444	£876.00	0.00	£876.00						
29		1258	01/02/2007	6	Sitting Pretty	446	£4,335.00	216.75	£4,118.25						
34		1264	12/02/2007	1	A.Daley Inc	444	£4,934.00	246.70	£4,687.30						
40		1270	23/02/2007	2	Comp. Stores	444	£3,650.00	109.50	£3,540.50						
54		1284	18/04/2007	4	Sitting Pretty	444	£2,193.00	32.90	£2,160.11						
62		1293	07/05/2007	6	Sitting Pretty	442	£4,739.00	236.95	£4,502.05						
74		1305	16/06/2007	3	Hardcopy stores	446	£4,253.00	212.65	£4,040.35						
80		1311	01/07/2007	3	Sitting Pretty	441	£4,263.00	213.15	£4,049.85						
82		1313	10/07/2007	3	Hardcopy stores	446	£4,536.00	226.80	£4,309.20						
84		1315	14/07/2007	3	Hardcopy stores	446	£4,926.00	246.30	£4,679.70						
93		1324	10/08/2007	3	Hardcopy stores	444	£2,778.00	41.67	£2,736.33						
95		1326	22/08/2007	4	Fixit Ltd	444	£1,082.00	10.82	£1,071.18						

Figure 18: Advanced filter set up

3.6.2. Apply an advanced filter with complex AND/OR criteria

Comparison criteria are created by entering the values that you are looking for immediately underneath the column heading in the criteria range. When the list is filtered, each record in the list is compared to the value(s) that has been entered in the criteria range. Records not matching the search criteria are hidden. For example, if you were searching the list for records with a **Budget Code** of **440 OR 444** the criteria range might look like this. See Figure 19

Budget Code
440
444

Figure 19: OR criteria example

Alternatively, if you were searching for invoices with a **Budget Code** of **440 OR 444** where **Budget Code 444** has an **Amount** field greater than **£4000**, the criteria range would look like this. See Figure 20

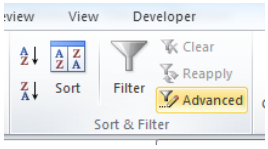
Budget Code	Amount
440	
444	>4000

Figure 20: AND criteria example

Bear in mind the following guidelines when searching for records.

- Criteria are entered immediately underneath the appropriate column heading in the criteria range
- If the search contains two criteria that must be satisfied (a logical **AND** condition) then the criteria are entered in the same row
- If the search contains two criteria, either of which may be satisfied (a logical **OR** condition) then the criteria are entered in different rows (one below the other).

To filter data on the criteria in Figure 20. Enter the criteria in to the criteria range. Click inside your list range and select **Data | Sort & Filter | Advanced**.



The Advanced Filter dialog box will appear. See Figure 21

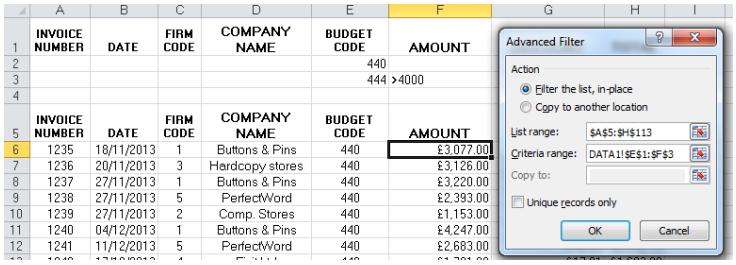


Figure 21: Advanced Filter dialog box

The list range will already be defined because you clicked into this on your previous step. Click into the **Criteria range** text box and select the range which contains your criteria, in this case it is E1:F3. Click **OK.**

The data will have now filtered according to the set criteria.

Exercise 5: Using the Advanced filter

Now look at this exercise (page 64)

3.6.3. Extract unique records in the same worksheet using an advanced filter

A very useful feature of the advanced filter facility is its ability to extract unique values from a list. This can create a master list of, for example Company Names and it is also a way to check for spelling mistakes in a list if the unique list is then sorted.

To extract unique records and copy them to the same worksheet. Click into the table/range of data and select **Data | Sort and Filter | Advanced filter.**

You then have an option to **Filter the list in-place** or **Copy to another location**. Select **Copy to another location**

The **List range** is the column of data you would like to locate a unique set of records from. The **Criteria range** can be left blank.

In the **Copy to** text box click into a cell in your existing worksheet and the cell reference will be inserted for you.

Add a tick to the **Unique records only** check box and click the **OK** button. See Figure 22

A unique list of **Company Names** will be placed into cell J1 and below.

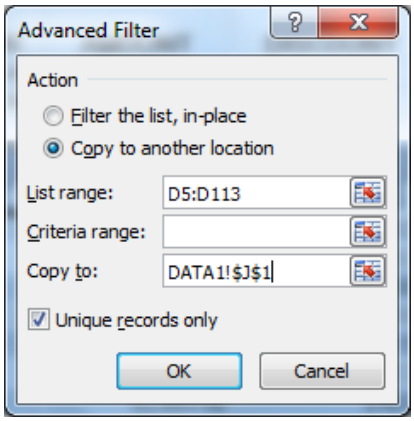


Figure 22: Filter unique records only – same worksheet

3.6.4. Extract unique records to a different worksheet using an advanced filter

If you want to copy a list of unique values to a different worksheet Excel will only allow you to filter the data on the active worksheet from where the advanced filter is activated.

Click into the worksheet where you would like your list to be placed. Select **Data | Sort and Filter | Advanced filter.** The Advanced Filter dialog box will appear.

Select **Copy to another location**

The **List range** is the column of data you would like to locate a unique set of records from. You will now need to click into the worksheet where your list is located and select the relevant column of data which holds the field of data you are filtering on.

The **Criteria range** can be left blank.

Select the **Copy to** text box and the worksheet you originally selected will open. Click into a cell in this worksheet and the worksheet and cell reference will be inserted for you.

Add a tick to the **Unique records only** check box and click the **OK** button. See Figure 23

A unique list of **Company Names** will be placed into worksheet **Sheet1**, cell **A1** and below.

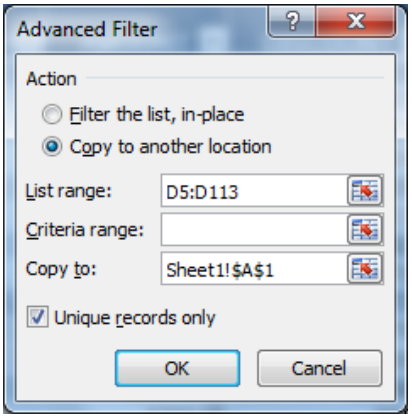


Figure 23: Filter unique records only – different worksheet

Exercise 6: Using Advanced Filter to Extract a unique records list

Now look at this exercise (page 64)

4 Summarize your Data

4.1. Subtotals

The **Subtotals** feature is used to summarise data in a range. Excel calculates subtotal values by using a summary function, such as Sum or Average and is not restricted solely to adding up information. You can display subtotals using more than one type of calculation in a range at a time.

In addition to providing subtotal calculations about the immediately preceding section, Excel also allows *Grand Totals* for the whole range. Grand Total values are derived from detail data, not from the values in the subtotal rows. For example, if you use the summary function Average, the Grand Total row displays an average of all detail data in the range, not an average of the values in the Subtotal rows. Excel recalculates Subtotal and Grand Total values automatically as you edit detail data.

You do not need to enter formulas as subtotals are automatically inserted into the range for you. Once subtotalled, you can use the **outline** feature see section 4.1.5, to hide or show various levels of detail in the range.

It may be useful to bear in mind the following guidelines when subtotalling a range:

- The data to be subtotalled must be organised as a list with labelled columns
- Carefully plan how the data is to be subtotalled, as the information has to be sorted before subtotals are applied
- When subtotalling, you must specify the following:
  - what columns are to be grouped;
  - the summary function(s) to be used;
  - what values are to be summarised.

4.1.1. Sorting the data

Before a range can be subtotalled it has to be sorted appropriately. The subtotals are inserted whenever the value in a specified field changes. To find the total sum of sales for each Company Name you would first need to sort the Company Name field before applying the subtotals.

You can also apply nested subtotals so the range must be sorted by the most important field first followed by the second.

4.1.2. Subtotal a range

Ensure you are working in a range of data and not a table. Click within your data and look at the ribbon on the top of your screen. Check that the **Table Tools** ribbon is not visible. If it is convert your table to a range using section 6 as a guide.

Sort your data according to your subtotal requirements, see section 4.1.1

Click into your range of data and click **Data | Outline | Subtotal**

The **Subtotal** dialog box will appear. See Figure 24

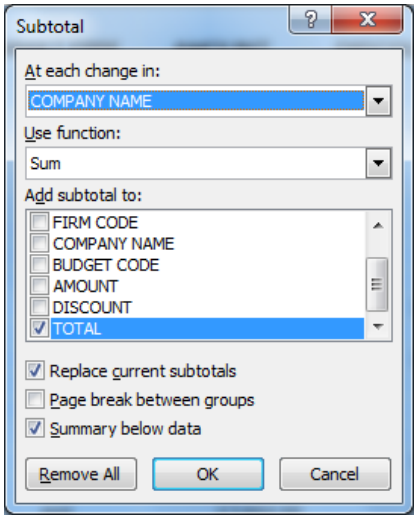


Figure 24: Subtotal dialog box

Tell Excel which column of repeating data you want to add subtotals to in the **At each change in.**

In the **Use function** select a relevant function from the list, for example, Sum, Count, Average.....

Click the check boxes alongside the relevant field names which you would like Excel to perform the previously selected function on.

Ensure Replace current subtotals is selected, which will replace any previously existing ones.

Click on **OK**

4.1.3. Nested subtotals

You may need to subtotal on more than one field and use a different function for each subtotal. To achieve this you need to ensure your data is sorted according to what you are subtotalling by.

For example, to analyse the value of total sales for a company and then count each budget code per company, the range would be sorted by **Company Name** and followed by **Budget Code.**

Perform your initial subtotal as per section 4.1.2. For example **at each change in Company Name sum** the **Total** column.

Add a nested subtotal. For example the count of budget code per Company Name

Click into your range of data and click **Data | Outline | Subtotal**

The **Subtotal** dialog box will appear. See Figure 24

At each change in choose the second field name that you want to subtotal by in this example it would be **Budget Code**.

In the **Use function** select a relevant function from the list, for example, Sum, Count, Average.....

Click the check boxes alongside the relevant field names which you would like Excel to perform the previously selected function on.

Uncheck the **Replace current subtotals** check box. This is the box which will ensure you do not overwrite the subtotals you initially applied.

Click on **OK**

4.1.4. Remove subtotals

To remove subtotals choose **Data | Subtotal** from the **Outline** category and click on **Remove All** to remove your subtotals.

Exercise 7: Subtotalling data in a range

Now look at this exercise (page 69)

4.1.5. Hide and Show Detail

When subtotals have been applied, Excel displays the outline symbols, down the left-hand side of the sheet see Figure 25, so that the organisation of the data is visible. Clicking on the various outline levels allows all the data to be shown including subtotals, the various levels of subtotals only, or collapses the data down so that only the grand total shows. A brief summary is presented below.

- Row level number buttons: Click to display relevant levels of data in an outline.
- Hide Detail box: This appears at the end of a level bar whose detail is displayed. Click this symbol to hide the detail data.
- Show Detail box: This appears besides a summary row whose detail is hidden. Click this symbol to show the detail data.
- The dots indicate the rows containing data.

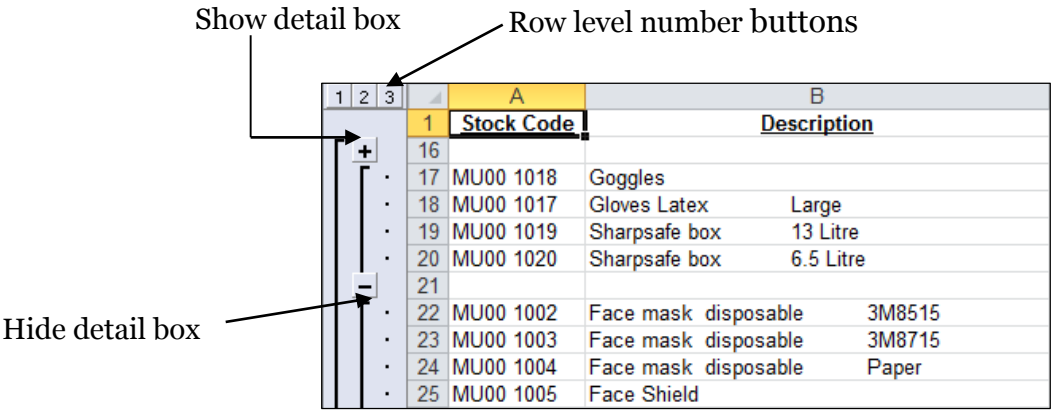


Figure 25: Subtotals details view

Exercises 8: Hiding and showing subtotal detail

Now look at this exercise (page 73)

4.2. Consolidate a range or table of data

Section 4.1 looks at using Excels Subtotals feature to summarise a range of data. Subtotals will not however work with a table.

Data consolidation will allow you to summarise data in a range or a table, as well as provide greater control over formatting your subtotal data.

You also do not need to pre-sort your data before using this feature.

If you are working with a range ensure all subtotals are removed. See section 4.1.4.

Click into the cell where you would like the summary to appear. This can be on the sheet containing the data or a new worksheet.

Click on **Data | Data Tools | Consolidate**. (Figure 26)

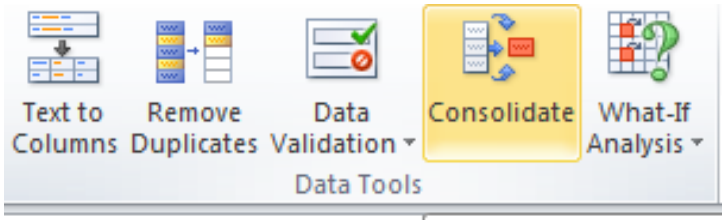


Figure 26: Data Tools Consolidate button

The **Consolidate** dialog box is displayed. (Figure 27)

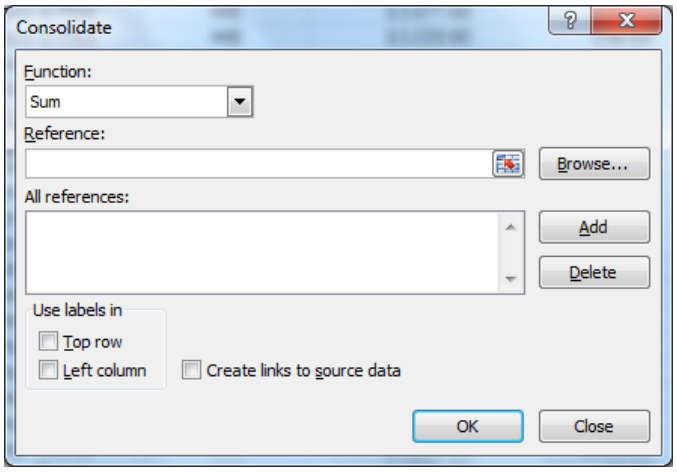


Figure 27: Consolidate dialog box

Select a relevant function from the **Function** drop down list, the default is **Sum**.

Click into the **Reference** text box and select a range to consolidate. The left most column of data will be the field which you are summarising, for example **Company Name** and the right most column will be the final field which contains the data you would like to summarise.

Check the two check boxes **Top row** and **Left column** and click on **OK** Your data will summarise similar to the example in Figure 28

Figure 28: Consolodated data view 1

You will see that it has summarised all fields which were selected, some of which you will not require. Delete fields which are not needed.

To insert additional totals alongside your summary, for example to count the number of sales per company. Select a cell next to your current summary, E1, and repeat the process, this time selecting **Count** from the **Function** menu.

Once again a surplus number of columns counting your data will appear, delete the columns which are not required. You can also amend column headings with your own text. Your summary may then look similar to below. (Figure 29)

	A	B	C	D	E	F
1		AMOUNT	DISCOUNT	TOTAL	Number of sales	
2	Buttons & Pins	£31,863.00	£1,072.08	£30,790.93	13	
3	Comp. Stores	£15,214.00	£341.02	£14,872.98	6	
4	Fixit Ltd	£52,492.00	£1,626.93	£50,865.08	20	
5	Hardcopy stores	£101,663.00	£2,837.91	£98,825.09	43	
6	PerfectWord	£27,892.00	£1,006.92	£26,885.09	10	
7	Sitting Pretty	£41,014.00	£1,504.15	£39,509.86	16	
8						

Figure 29: Consolodated data view 2

Exercise 9: Consolidate data

Now look at this exercise (page 74)

5 Charts

5.1. Using charts

A chart is a graphic representation of worksheet data and is particularly useful for 'spotting' trends or visualising relationships within your data.

In *Excel*, data already set out in a worksheet can be presented as a chart, whether the cells contain constant values or calculations. A chart may be created as a new sheet in a workbook (a *chart sheet*) or as an *embedded* chart on the same sheet as your workbook data. An embedded chart is useful because both the chart and the data may be viewed at the same time.

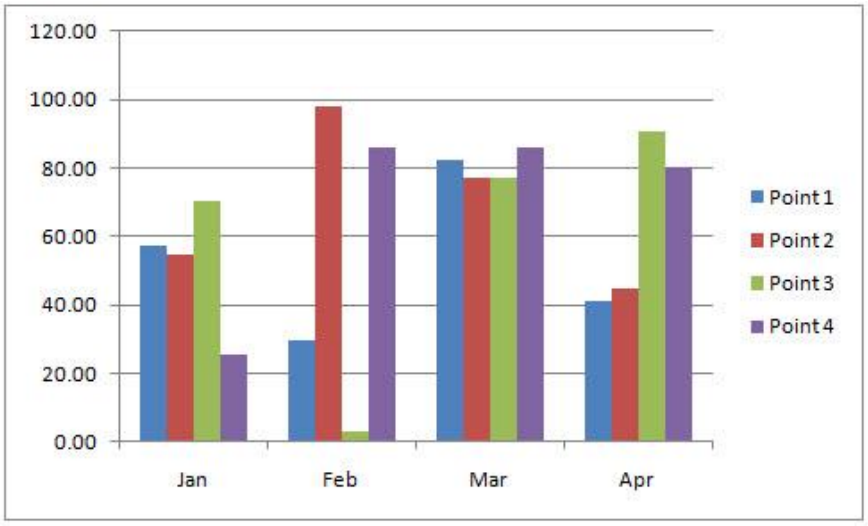


Figure 29: A column chart

5.2. Creating a Chart from Worksheet Data Using the Charts Tools

The simple procedure to create a chart is to pre-select the data and choose the appropriate chart type from the **Quick Analysis Tool** to the **right** of the chart. Every chart type category has several sub-types, so it is interesting to explore what is available.

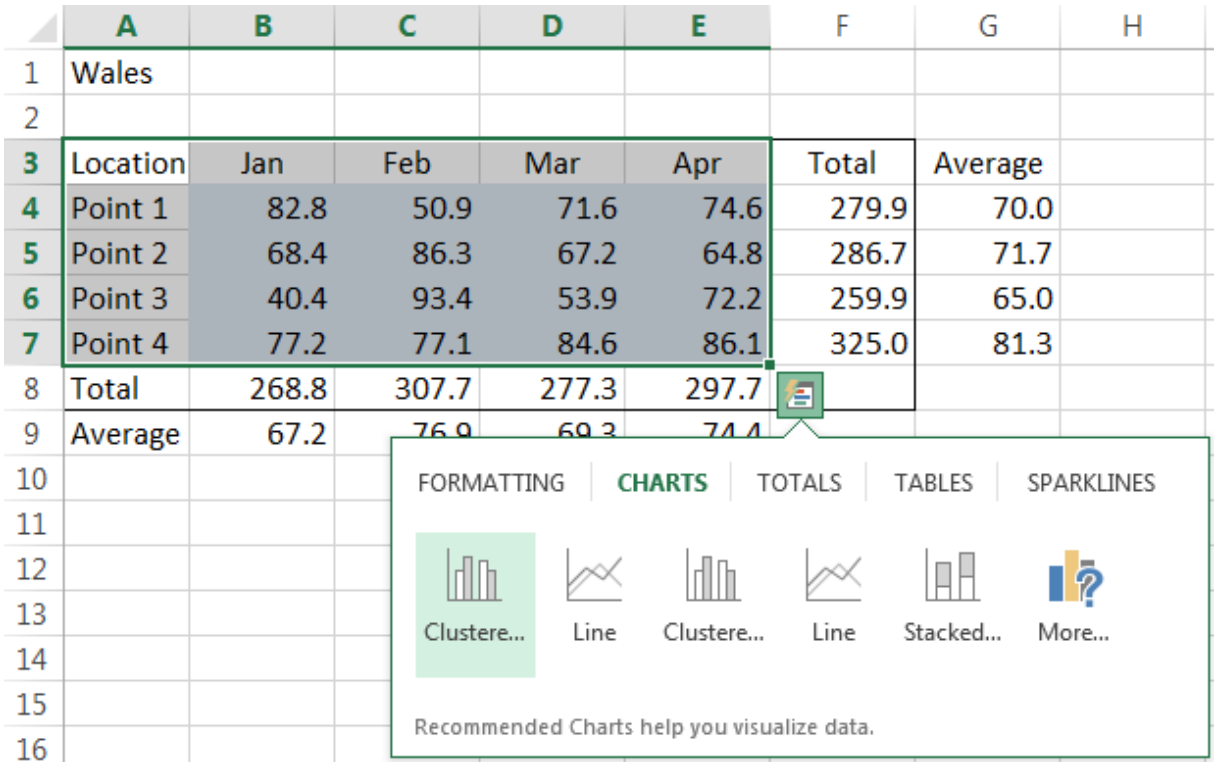


Figure 30: Select the data to be plotted and the chart type

5.3. Keystroke F11 for Creating a Chart

A useful keystroke if you are creating a number of charts is F11. First select the range(s) of data to be included, and then press F11. A simple chart is immediately created on a new chart sheet, based on the selected data, using all the default settings.

5.3.1. Exercise 10: Creating charts

Now look at this exercise (page 69).

5.4. The Chart Tools for Working on Chart Objects

Once a chart has been created, two additional ribbon tabs appear on the toolbar 1. These are **Design**, **Layout** and **Format** tabs. Each tab contains several options to customise a chart.

Figure 31: Chart ribbon tabs

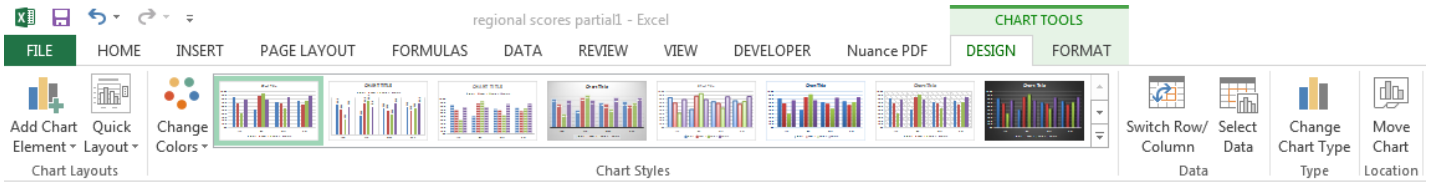


Figure 32: Chart Design tab

From the **Chart Design** tab, you have the option to change the chart type, chart data, chart style as well as the location. You are also able to add chart elements to the chart i.e. Title, legend and data labels, you can move the chart location (so that the chart is on its own data sheet rather than embedded into the data sheet.

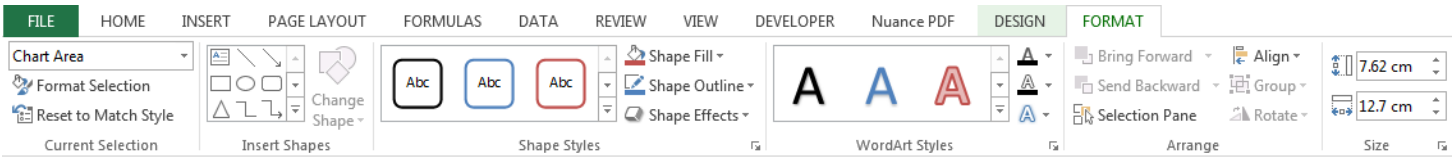


Figure 34: Chart Format tab

The Chart Format tab, contains more options to format the chart objects, i.e. change the size of the height and the width of the chart, change the colours of the bars/segments of the chart, allowing individual chart objects can be altered. In addition, chart annotation can be performed easily, e.g., add textbox, arrow or picture to the chart.

5.5. Rearranging the Chart

The **Chart Design** tab of the ribbon has some useful tools for changing the overall appearance of a chart.

is used to move a chart between being embedded on a worksheet or having its own chart sheet.

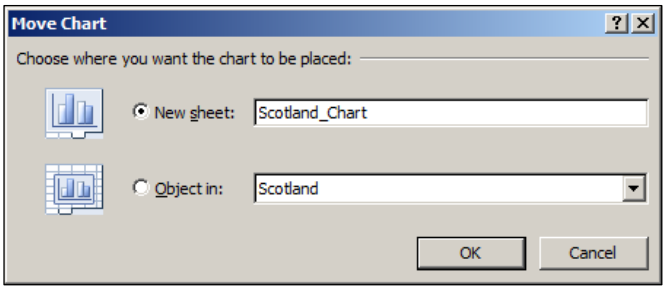


Figure 35: The Move Chart dialog

Chart type 

is used for changing between bar chart, column chart, line chart, pie chart etc. Different chart types are suitable for different kinds of data, so it is worth experimenting to find the type that presents your data best.

Switching the data series between row and column 

may make the chart easier to understand.

A variety of chart styles and colour schemes are available, in the Styles gallery. Even more colour schemes are shown if you click :

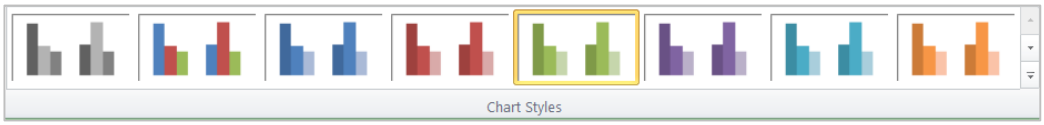


Figure 36: Chart Styles Gallery

Exercise 11: Rearranging the chart

Now look at this exercise (page 79).

6 Working on Individual Chart Objects

A chart is made up of many parts or objects, such as the axes, titles, data series (made up of data points), plot area etc.

To know the name of each object, move the mouse pointer over the object and wait a moment: a yellow ScreenTip will appear.

These can usually be rearranged or formatted separately. Simply select any object on the chart and click Format Selection on the **Chart Tools | Format Selection** tab of the ribbon. The **Format Plot Area Options** dialog box contains valuable options that belong to the chosen object. Remember that you are changing the appearance, not the values plotted.

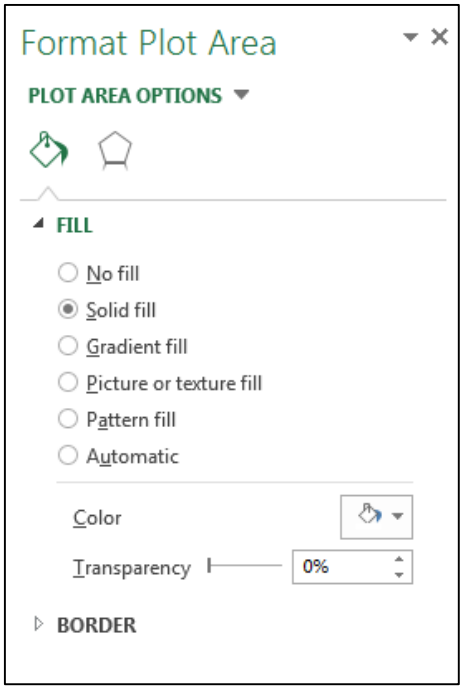


Figure 37: The Format Chart Area dialog

6.1. Selecting On a Chart

Once selected, a chart object can normally be edited, moved, resized, formatted or deleted.

6.1.1. Selecting Parts of a Chart

To select any chart object, simply position the mouse pointer over the object and click once. Blue object handles appear to indicate that the object has been selected.

The name of the part currently selected is also displayed in the Chart Elements drop-down control at the left end of the **Layout** and **Format** tabs of the ribbon Plot Area. Elements like the chart title, the legend, and the axis titles can all be selected using this Chart Elements control.

6.1.2. Selecting a Data Series or a Data Point

Click once on a data line or one of the columns, bars etc. to select a whole data series. Just a few blue handles appear to indicate which series has been selected. Click again

to select an individual data point. More handles appear on the selected data point only.

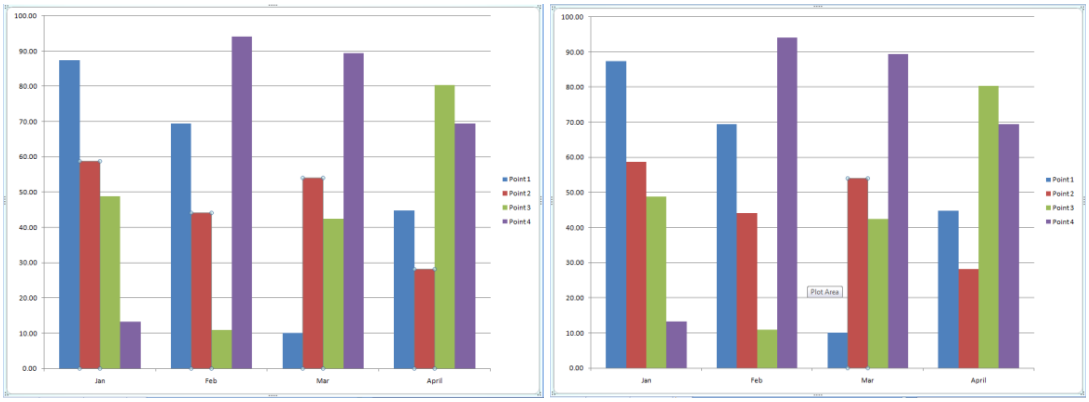


Figure 38: Blue handles show a series selected then one data point selected

Deselecting a Chart Object

To deselect the chart object, either press ESCAPE or click away from the object. Beware that another object may then be selected by accident.

6.2. Moving a Chart Object

Some chart objects can be moved by selecting then dragging. Beware that individual data points can also sometimes be dragged - the values set in the worksheet are adjusted accordingly.

6.3. Resizing a Chart Object

Some chart objects such as the legend can be resized by dragging black handles.

6.4. Deleting A Chart Object

Once an object has been selected, pressing DELETE will delete the object. If you delete something by accident, immediately undo.

6.4.1. Exercise 12: Selecting and resizing chart object

Now look at this exercise (page 80).

7 Formatting a Chart

7.1. Formatting Parts Of A Chart

Excel has very powerful chart formatting facilities. You can change the appearance of the entire chart or various parts of the chart to suit your requirements. For example, you can change the font, size, appearance, colour of the text, colour and pattern of shading to your chart titles, axes, data point and so on. Some ideas are presented below.

7.1.1. Formatting Using the Formatting Buttons

The formatting buttons on the **Home** tab of the ribbon may already be familiar. Use the ScreenTips and Help to learn about any which are unfamiliar. As with any *Windows* formatting action, first select the object to be changed, then click the chosen tool.

These buttons become available as appropriate, depending on the selected chart object. For example, a data column can have its fill colour changed, whereas the text of a title can have extensive font formatting with changes to typeface, font size and colour, bold or italic faces, alignment and so on.

7.1.2. Formatting Using the Format Tab of the Ribbon

The **Chart Format** tab appears along with the **Chart Design**, when a chart or part of a chart is selected. This offers further formatting options.

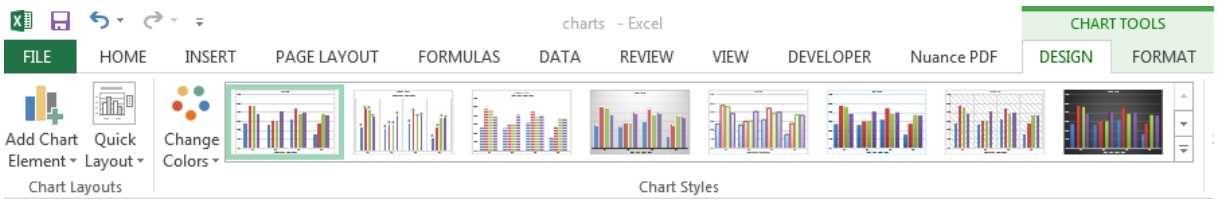


Figure 39: Shape Styles

7.1.3. Formatting Using the Format Dialogs

Further options are found in the **Format** dialogs. The options vary, depending on the chart part that is selected. There are several ways to display the relevant **Format** dialog:

- double-click part of a chart to show the relevant **Format** dialog which appears to the right had side of the chart
- right-click part of a chart to show a context menu including the command to **Format** [***the kind of object selected***]
- select part of a chart and click Format Selection on the **Format** tab

When the dialog is displayed, confirm that its title shows the part of the chart you intended to work on. Then choose a category from the list on the left, and make changes to the settings shown on the right.

7.1.4. Exercise 13: Formatting the chart

Now look at this exercise (page 81).

7.2. Controlling the Axis Scale

When a chart is created, *Excel* chooses each axis scale i.e. the maximum and minimum values shown on the axis. These values may not be appropriate, especially if you are creating a set of charts which are to be compared. You can set the values on the axis scale, using the **Axis Options** from the **Format Axis** command.

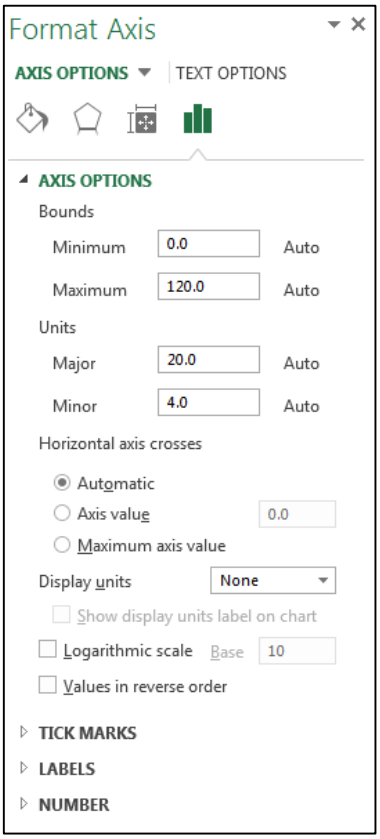


Figure 40: Setting an axis scale

7.3. Labelling Parts of a Chart

Once the chart has been plotted, the next step is to label it. Depending on the type of chart, any of the following might be appropriate: chart title, legend, category and value axis labels, data labels, and annotations.

Labelling (chart title, labels on the horizontal and vertical axes, the legend and many other labels) can be added from the **Layout** tab of the ribbon.

A chart title usually appears at the top centre of a chart. Each axis should also usually have a title, specifying what is plotted and, preferably, the units.

7.3.1. Exercise 14: Making a chart more readable

Now look at this exercise (page 83).

7.3.2. Data Labels

Data labels display data values or text next to each data point on the chart. These are shown using **Add Chart Element | Data Labels | More Options** on the **Chart Design** tab of the ribbon.

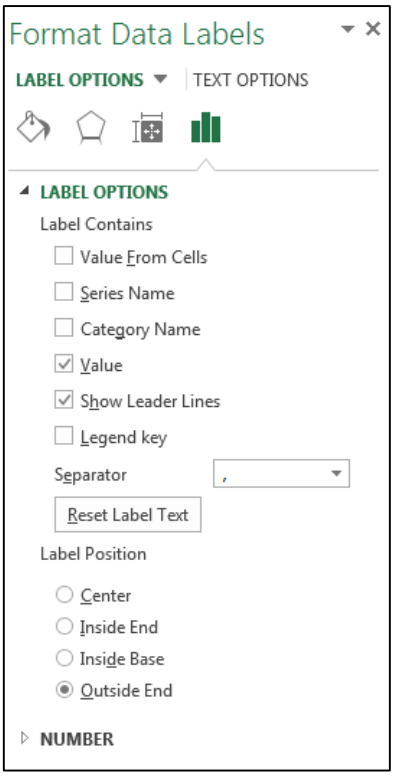


Figure 41: The Format Data Labels Dialog

7.3.3. A Legend

A legend is a list of the data series shown in a chart, with the colours or line styles that represent each.

To insert a legend, click **Add Chart Element | Legend | More Options** from the **Design** tab of the ribbon and select the preferred position of the legend. To delete the legend, simply select it and press DELETE. To format and customise a legend, select the legend and click Format Selection on the **Chart Format** tab of the ribbon.

7.3.4. Data Table

A data table is a table showing the values plotted, shown alongside the chart. A data table can be shown/hidden using **Add Chart Element | Data Table | More Options** on the **Design** tab.

7.3.5. Gridlines

Some charts are easier to understand if gridlines are shown. You can insert/remove the gridlines using **Add Chart Element | Gridlines | More Options** on the **Design** tab, select **No Line** from the **Format Major Gridlines** on the right hand side of the chart.

7.3.6. Exercise 15: More chart options

Now look at this exercise (page 76).

8 Working With Data Series in a Chart

8.1. Axes Options

Add Chart Element | Gridlines | More Options on the Design tab gives you control over the vertical axis and/or the horizontal axis. A labelled axis is usually needed, to give value to the chart data points, but you have a choice over where the labels are drawn.

8.1.1. Axes on a Chart: Naming?

Various conventions are used for naming the axes of a chart.

Excel specifies the main axes of a chart as "horizontal" and "vertical". These are sometimes referred to as the "X" axis and "Y" axis respectively.

In a chart such as a column chart, the categories (labels) are shown along the horizontal axis and the values (numbers) are shown vertically. However if the same chart is converted to a bar chart, the categories appear stacked vertically and the values are plotted horizontally across the page.

Of course some chart types, such as a pie chart, do not have axes in this sense at all.

8.2. Plotting Non-Adjacent Areas

The worksheet data used to plot a chart is typically contained in one contiguous range on the worksheet. However it is possible for a chart to draw data from several non-adjacent areas, even from different worksheets.

A new chart can be created which draws data from 2 or more non-contiguous (separate) ranges, provided the ranges are all on the same worksheet.

The procedure is:

1) Select one range of cells
2) Hold CTRL and select another range of cells on the same worksheet
3) Use the Insert tab of the ribbon to insert one of the chart types

8.2.1. Exercise 16: Plotting non-adjacent ranges

Now look at this exercise (page 87).

8.3. Inserting More Data into an Existing Chart

Once a chart has been plotted, you can extend the chart to include new data . This is useful if you wish to draw together data from other worksheets and show it all together in one chart.

On the Design tab of the ribbon you have an icon called **Select Data** which displays a dialog where you can add additional data series (and edit or remove them). This is also the place to adjust if necessary the labels for the horizontal axis, or to edit the range where these labels are to be found.

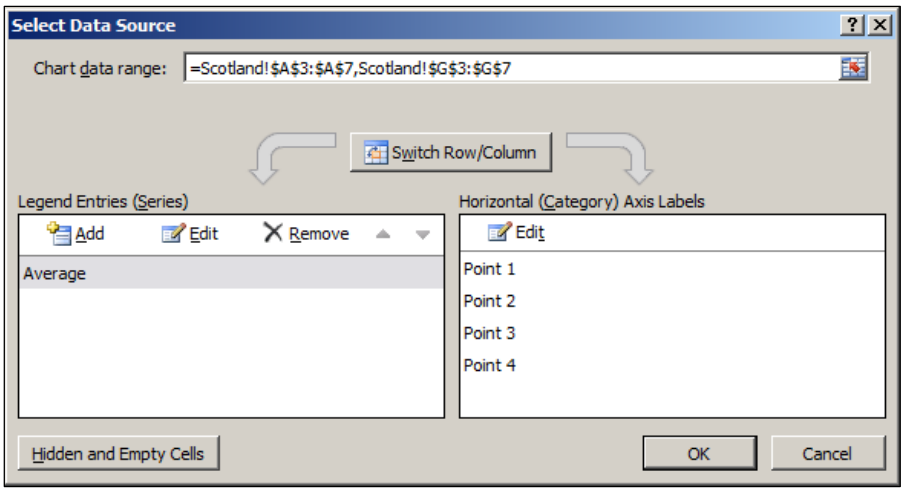


Figure 42: The Select Data Source dialog

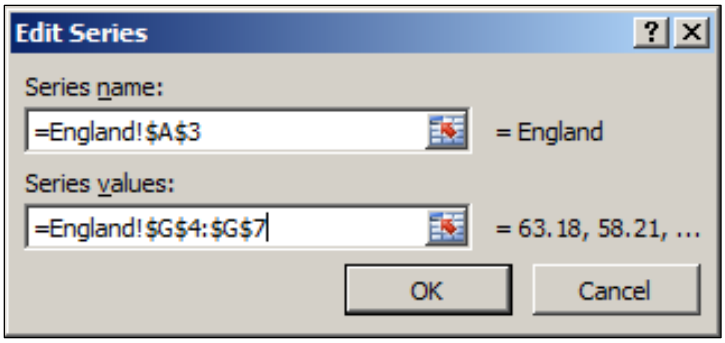


Figure 43: Adding A New Data Series

8.4. Adding a Data series by Copy/Paste

An alternative method of adding extra data to an existing embedded chart is to select the extra range of cells on the worksheet, then **Copy** and **Paste** them onto the chart.

8.5. Deleting a Data Series

To remove an unwanted data series from a chart, select the appropriate data series on the chart and press DELETE. If you make a mistake, immediately press CTRL + Z or choose **Undo**. The data remains in the worksheet.

8.5.1. Exercise 17: Adding more non-adjacent ranges

Now look at this exercise (page 88).

8.6. A Chart with Mixed Types

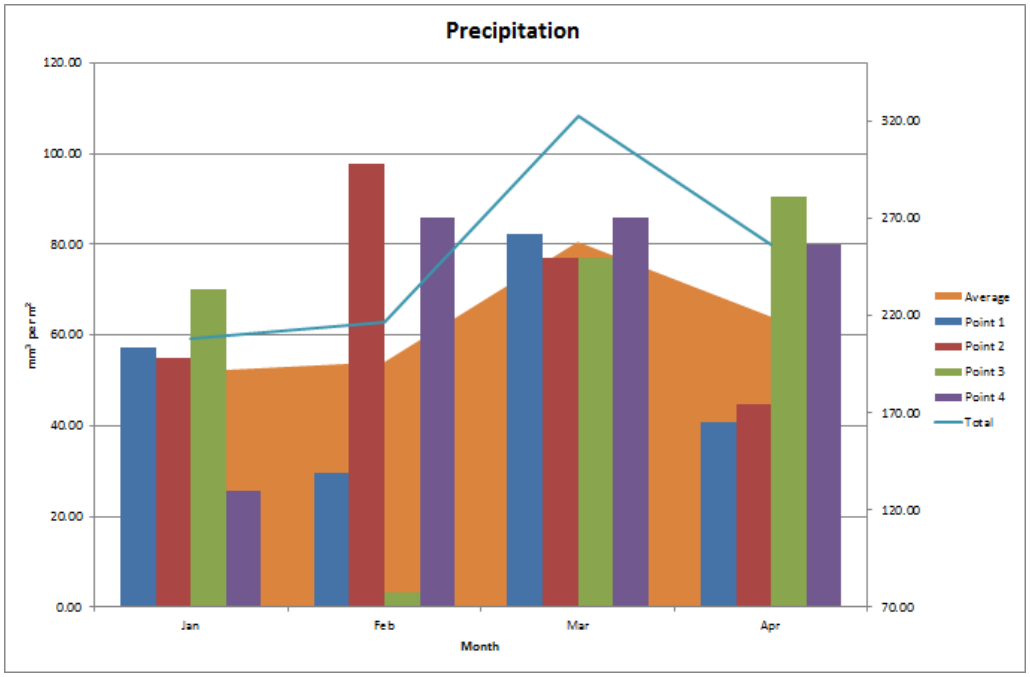


Figure 44: A Chart with Mixed Types

A chart can combine two or more types of chart, so it illustrates different types of information simultaneously. For example, one data series can be shown in columns and another data series appears as a line *on the same chart*.

This is a good way of making one data series stand out, especially if it is a different *kind* of data from the rest.

This is done by selecting the data series on the chart, then changing the chart type using 

on the **Chart Design** tab of the ribbon.

8.6.1. Exercise 18: A chart with mixed types

Now look at this exercise (page 91).

8.7. Secondary Axis on a Chart

If one data series on a chart has values that are quite different from the other series, or if it is a different kind of quantity, then the primary vertical axis is not suitable. A secondary axis allows one series to be plotted over a different range from the main chart.

The setting for a secondary axis is in the Format Data Series dialog, in the **Series Options** category.

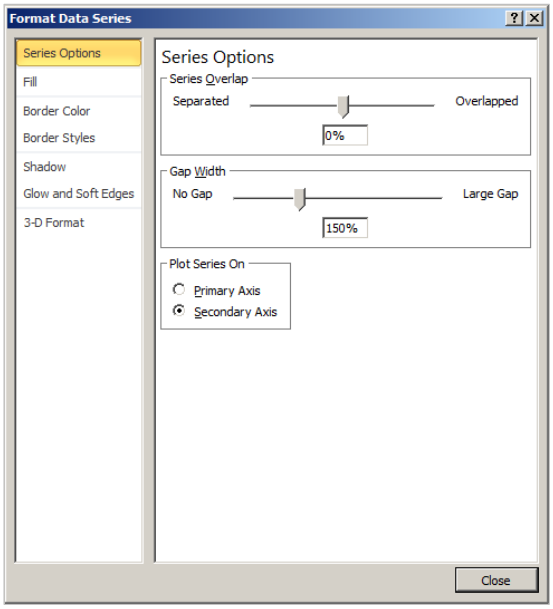


Figure 45: The Format Data Series dialog

Such a data series would usually be presented with a different chart type, so that it stands out from the rest of the data series.

It is usually important then to specify a suitable vertical axis scale, and alter the legend to make the series clear.

8.7.1. Exercise 19: A combination chart with a secondary axis

Now look at this exercise (page 93).

9 Charts With Lines

One of the tricky questions with charting is the distinction between a Line chart and an XY Scatter chart. The key difference is the treatment of the (X) category data axis.

A Line chart treats the X axis data as non-numeric, category information equally spaced out along the horizontal axis. This is good for category data such as text labels (text values like Qtr1, Qtr2, and Qtr3) but can produce unexpected results when the X values consist of numbers.

A Scatter chart has two value axes, showing one set of numerical data along the X-axis and another along the Y-axis. It plots each value as a single data point, so the points appear at uneven intervals, maybe in clusters.

9.1. When to Use a Line Chart

A Line chart can display several categories of data, set against a common scale. As a general rule, you may want to use a Line chart if your data has non-numeric X-values. For numeric X-values, consider using a Scatter chart.

For example, Figure 46 shows the number of times certain courses were run at IT Services in the years 2003 and 2004. The horizontal axis shows the types of courses run; the course types are evenly spaced along the horizontal axis. The figures for the years 2003 and 2004 are shown as separate series, so they can be compared. This line chart is easy to read and shows clearly the important data including the course titles shown on the horizontal axis.

Line charts display lines joining a set of data points, with or without data markers. Unlike Scatter charts, Line charts can even be displayed with a 3D visual effect.

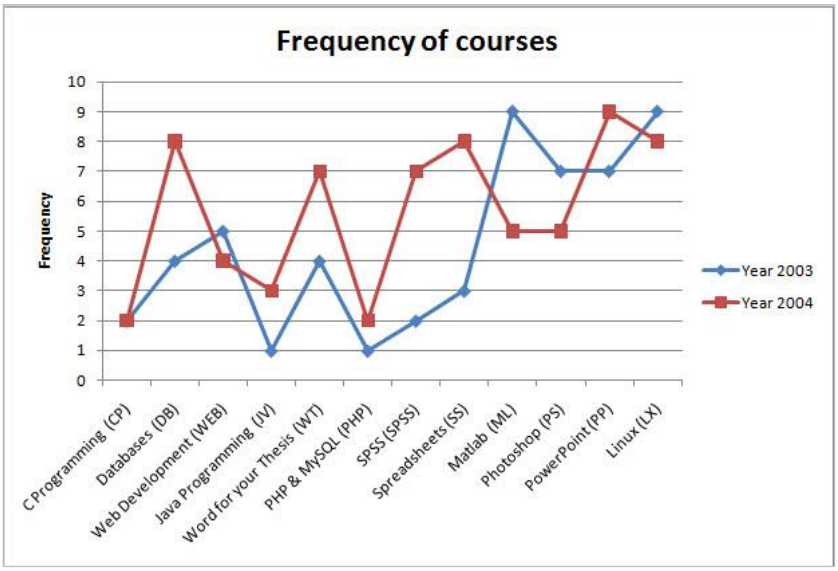


Figure 46: Line chart

9.1.1. Exercise 20: Create a line chart

Now look at this exercise (page 95).

9.2. When to Use a Scatter Chart

Scatter charts are commonly used for displaying and comparing numeric values such as scientific, statistical, and engineering data. The more data included in a Scatter chart, the better the comparisons that can be made.

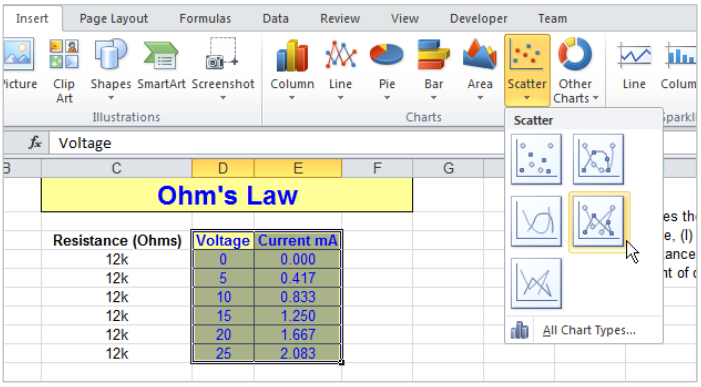


Figure 47: Creating a Scatter Chart

A Scatter chart can be used to show similarities between large sets of data. Rather than showing the differences, a Scatter chart can point out interesting similarities.

In the example shown in Figure 48, the same data has been plotted (as used in) but as pairs or grouped sets of values. In this example the paired data is numeric data, the number of courses run in the two years 2003 and 2004. Each point represents a different course.

If a data point lies on the diagonal line from (0, 0) to (10, 10), the y = x line, then it represents a course that was run the same number of times in both years.

Data points lying below the line were run more often in 2003 and points above the line were run more often in 2004.

In a scatter chart the independent scales can be adjusted to reveal more information about the data values.

(Exercise 12 below gives the steps for drawing a line y=x onto a data chart.)

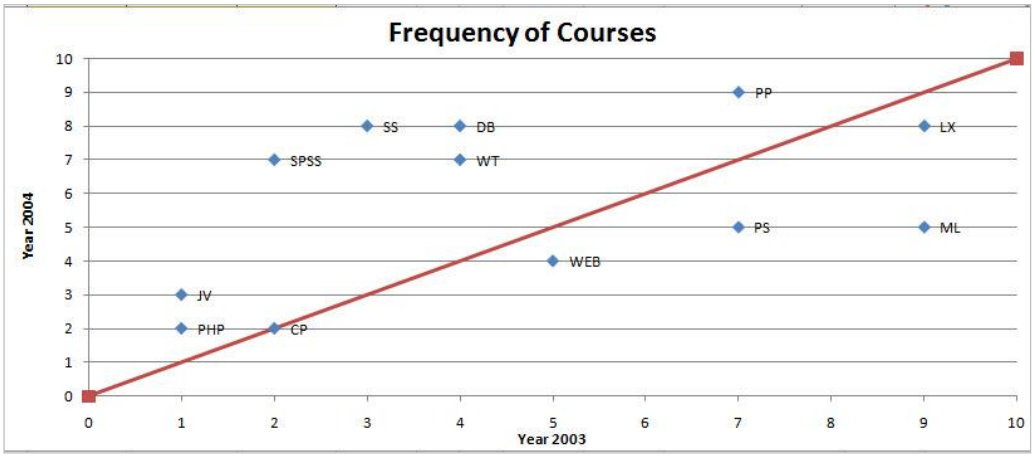


Figure 48: Scatter chart

9.2.1. Exercise 21: Create a basic scatter chart

Now look at this exercise (page 96).

9.2.2. Exercise 22: Create another scatter chart

Now look at this exercise (page 98).

9.2.3. Exercise 23: Improve the scatter chart with a line (*Optional*)

Now look at this exercise (page 99).

10 Histograms

A histogram is a chart that shows a visual impression of the **distribution of data** across categories and is commonly used to summarise a long list of data.

Histograms are usually drawn with vertical columns. The horizontal axis is organised into data ranges, and each column shows the number of data points falling into each range. For example, data of family incomes could be grouped into £5,000 intervals, and show the number of households whose income falls in each range.

10.1. Common histogram shapes

When you create a histogram it will probably be defined by one of four overall shapes:

- Symmetric
- Skewed right (positively skewed)
- Skewed left (negatively skewed)
- Multiple peaks

We will look at these types below

10.2. Planning the data for a histogram

We have said a histogram shows a visual impression of the distribution of data or how many observations (data points) fall in various ranges of values. So first you have to decide what your range of values (bin ranges) are.

A good way to choose bin ranges is to divide the range of values (smallest - largest) into equally spaced categories. One example could be to work with all IQ values between 49 and 168. So bin values for this could be like those in Figure

	A	B	C
1	ID	IQ	Bin
2	1	56	60
3	2	137	70
4	3	50	80
5	4	125	90
6	5	141	100
7	6	153	110
8	7	156	120
9	8	138	130
10	9	72	
11	10	62	
12	11	88	
13	12	62	
14	13	51	
15	14	92	
16	15	60	
17	16	74	
18	17	123	
19	18	100	
20	19	109	
21	20	115	
22			

Figure 50: Histogram data

Note that the bin numbers must be entered in ascending order and although ranges do not have to be evenly spaced, beware as unequal ranges can be misleading to the audience.

If you don't enter bin numbers on the worksheet the Histogram tool automatically creates evenly distributed bin intervals however, these bins may not be useful so it is recommended that you use your own bin numbers.

10.3. Create a Histogram

Before a histogram can be created you will need to install the **Data Analysis ToolPak**. To install this please follow the instructions in section

- To create the Histogram, click into your data and select **Data | Analysis | Data Analysis | Histogram** then click **OK** and the Histogram dialog box will appear, see Figure

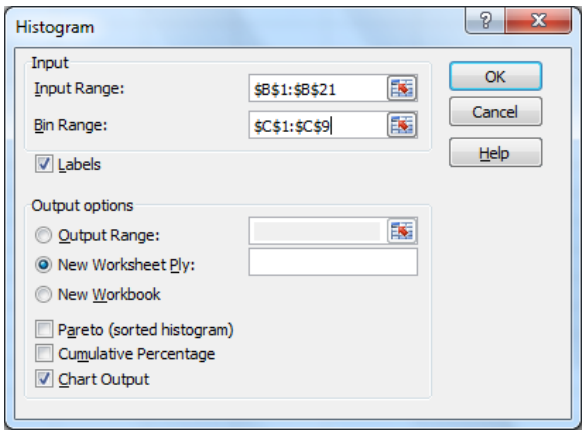


Figure 51: Histogram dialog box

- The **Input Range** relates to the input data that you want to analyse in the example we are using here it relates to the IQ values in column B.
- The **Bin Range** relates to a range that contains an optional set of boundary values that define the bin ranges. In this example the values are in column C.
- If the first row or cell in the column of your input range contains labels, select the **Labels** check box.

In **Output options**, there are three further options. If **Output Range** is selected, a cell reference is required of where you want the histogram frequency data and chart to be placed.

- Click into the **Chart Output** check box and then select **OK**

Your data will then be summarised as a frequency table and a histogram chart. See Figure

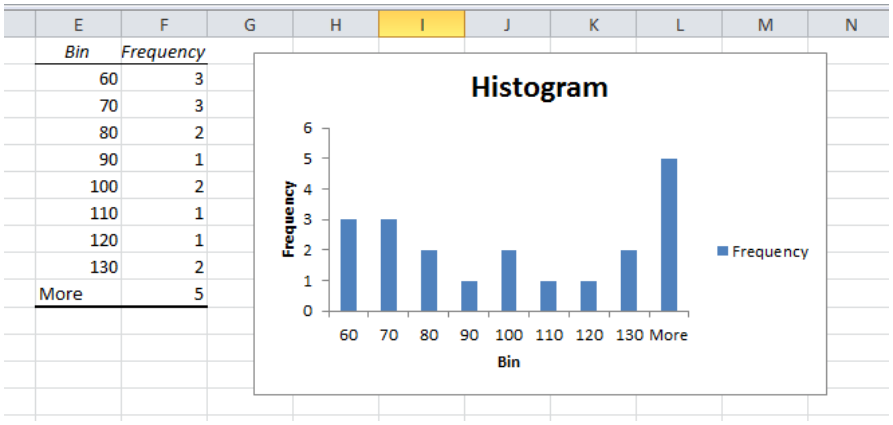


Figure 52: Histogram frequency table and chart

The Histogram data analysis tool works on a list of data values, grouping them into ranges. It counts the frequency of data points in each bin range, and optionally presents the result in a chart. Note that these frequency counts are not dynamic: if the data changes, you must re-run the Histogram analysis.

10.4. Analysis ToolPak

Before you can use the Histogram tool, you will need to install the **Analysis ToolPak Add-in**.

Click on the **File** tab then select **Options** in the left panel, see Figure

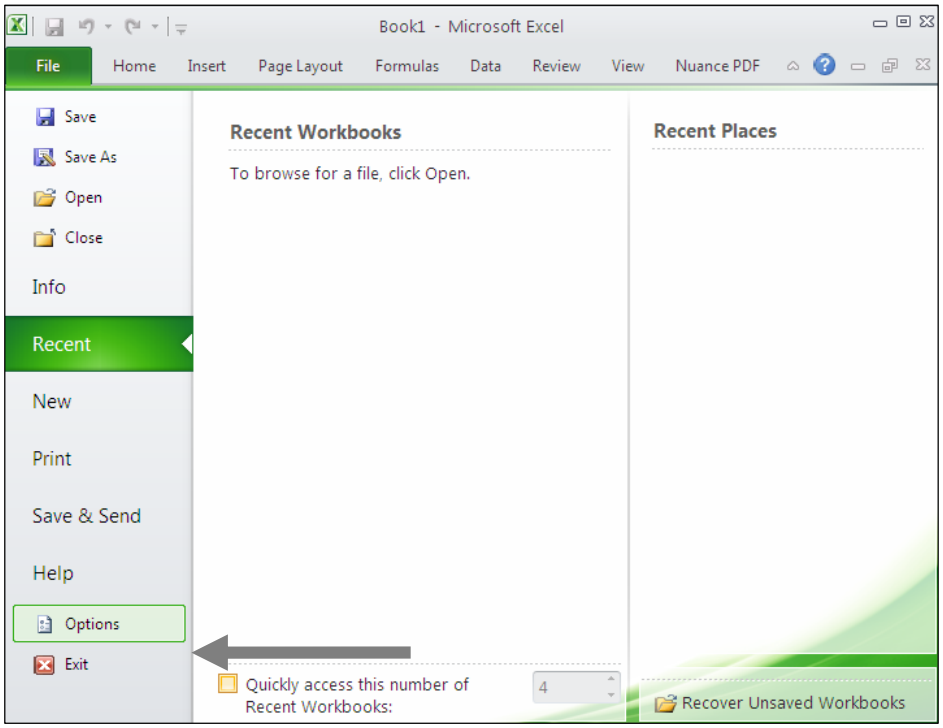


Figure 53: File Options screen

Select **Add-Ins** and then click **Go** shown at the bottom of the window in Figure

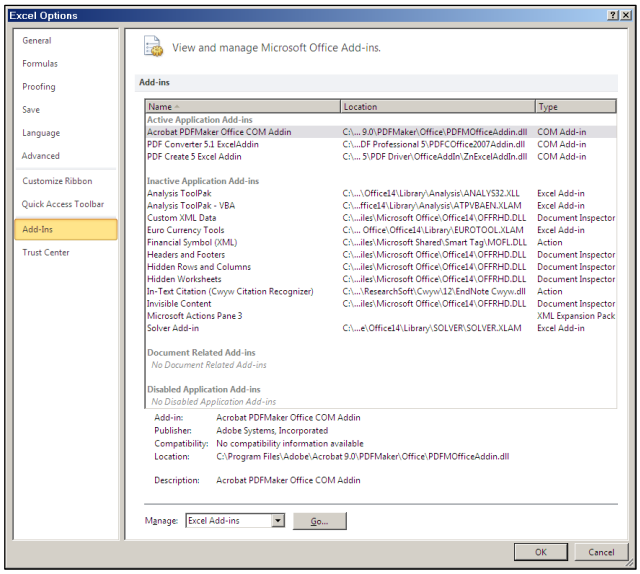


Figure 54: Excel Options dialog

Select the **Analysis ToolPak** check box in the **Add-Ins available** on the **Add-Ins** dialog box as shown in Figure

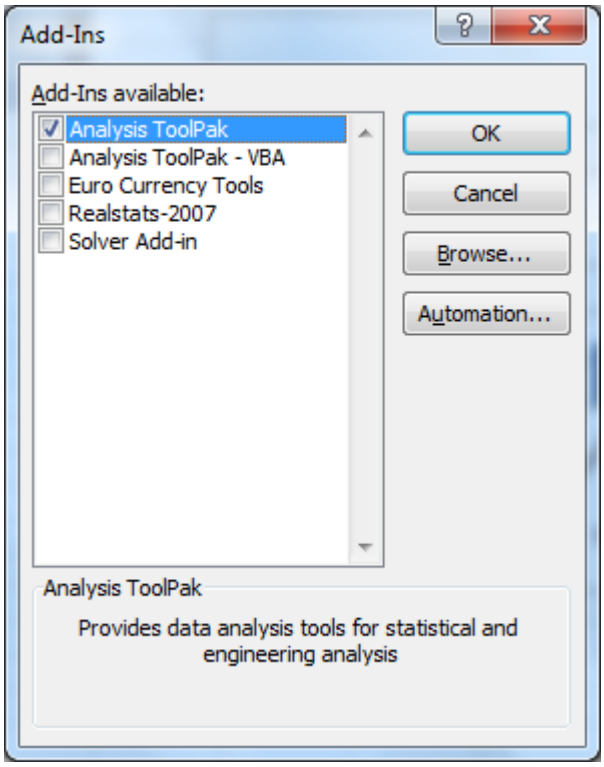


Figure 55: Add-Ins Analysis ToolPak

Select OK , wait for Excel to finish configuring. The Analysis ToolPak can now be located in **Data | Analysis | Data Analysis** see Figure

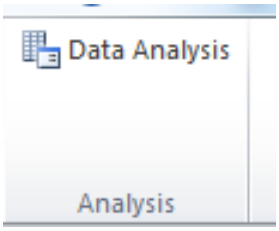
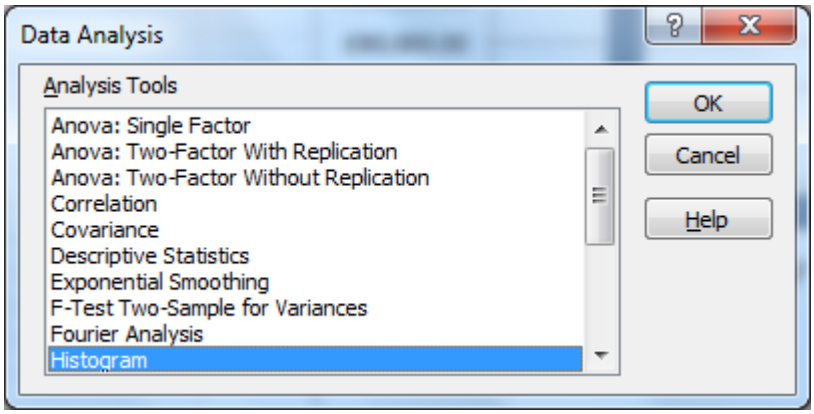


Figure 56: Data Analysis ToolPak

On selecting **Data Analysis** the **Data Analysis** dialog box appears and under the **Analysis Tools** menu select **Histogram** and then click on **OK**



Exercise 22: Install the Analysis ToolPak Add-in

Page 46 – instructions on how to install the Analysis ToolPak Add-in

Exercise 23: Creating a histogram

Now look at this exercise (page 102)

11 Sparklines

Sparklines are tiny charts that fit into a single cell in a worksheet. They can be used to highlight trends or changes that may not be easily spotted in the data itself or if there is too much data to plot in a single chart. An example of a data set and singular graphs made from this data can be seen below in Figure 57: Data set and singular graphs

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	Company	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2	Buttons & Pins	£1,386.99	£3,227.19	£2,639.80	£5,932.62	£233.00	£357.99	£2,984.69	£233.00	£1,950.30	£4,687.30	£3,123.40	£4,034.65
3	Comp. Stores	£348.00	£3,912.10	£1,394.91	£3,540.50	£4,536.00	£1,141.47	£2,452.65	£1,464.21	£2,541.30	£2,742.24	£2,535.39	
4	Fixit Ltd	£4,935.35	£7,864.20	£4,710.27	£7,026.68	£6,994.60	£4,099.52	£498.00	£947.00	£3,386.27	£4,725.40	£3,993.80	£1,683.99
5	Hardcopy stores	£2,037.39	£3,571.81	£5,154.63	£9,148.72	£2,324.60	£7,750.60	£4,681.20	£4,527.06	£4,902.49	£693.10	£2,704.81	£3,739.37
6	PerfectWord	£3,276.66	£1,375.11	£1,054.35	£2,144.35	£1,287.66	£4,287.35	£2,357.11	£2,642.76	£4,326.30	£4,133.45		
7	Plugs and Sockets	£3,855.10	£1,976.04	£1,058.31	£2,700.35	£2,908.71	£4,737.03	£646.00	£2,736.33	£1,941.39	£4,686.35	£3,032.22	£5,575.70
8	Sitting Pretty		£4,118.25	£2,550.17	£2,160.11	£4,680.21	£5,287.05	£4,049.85	£6,181.68	£4,155.35	£848.25	£2,445.76	£3,033.19

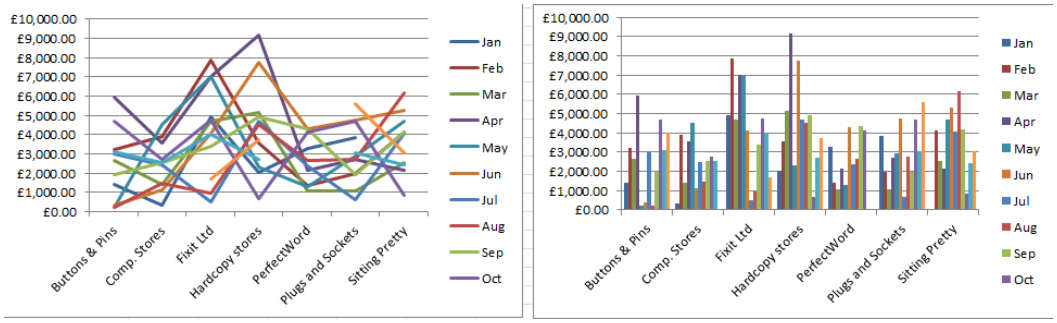


Figure 57: Data set and singular graphs

Sparklines can be easily added with just a few clicks of the mouse. They are dynamic and update automatically when the source data changes.

11.1. Insert Sparklines

- Click into a cell to the right of your row of data, in the above example this would be N2
- Click on **Insert | Sparklines | Line** from the ribbon. The **Create Sparklines** dialog appears. See Figure

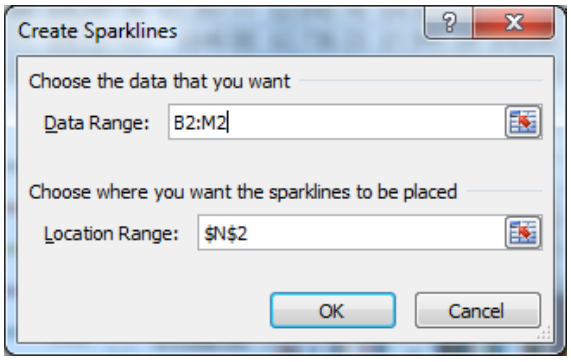


Figure 58: Create Sparklines dialog

- Click in the **Data Range** and select the row of data you would like to create the Sparklines from, the **Data Range**, using the example in Figure 59 would be B2:M2.
- Click the **OK** button. A Sparkline will appear in cell N2.
- AutoFill the Sparkline to the rows below.

You can add different Sparkline graphs to different columns, see Figure below.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	Company	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
2	Buttons & Pins	£1,386.99	£3,227.19	£2,639.80	£5,932.62	£233.00	£357.99	£2,984.69	£233.00	£1,950.30	£4,687.30	£3,123.40	£4,034.65		
3	Comp. Stores	£348.00	£3,912.10	£1,394.91	£3,540.50	£4,536.00	£1,141.47	£2,452.65	£1,464.21	£2,541.30	£2,742.24	£2,535.39			
4	Fixit Ltd	£4,935.35	£7,864.20	£4,710.27	£7,026.68	£6,994.60	£4,099.52	£498.00	£947.00	£3,386.27	£4,725.40	£3,993.80	£1,683.99		
5	Hardcopy stores	£2,037.39	£3,571.81	£5,154.63	£9,148.72	£2,324.60	£7,750.60	£4,681.20	£4,527.06	£4,902.49	£693.10	£2,704.81	£3,739.37		
6	PerfectWord	£3,276.66	£1,375.11	£1,054.35	£2,144.35	£1,287.66	£4,287.35	£2,357.11	£2,642.76	£4,326.30	£4,133.45				
7	Plugs and Sockets	£3,855.10	£1,976.04	£1,058.31	£2,700.35	£2,908.71	£4,737.03	£646.00	£2,736.33	£1,941.39	£4,686.35	£3,032.22	£5,575.70		
8	Sitting Pretty		£4,118.25	£2,550.17	£2,160.11	£4,680.21	£5,287.05	£4,049.85	£6,181.68	£4,155.35	£848.25	£2,445.76	£3,033.19		

Figure 59: Sparklines

Note that on selecting a Sparkline a new ribbon will appear, the Sparkline Tools Design ribbon, see

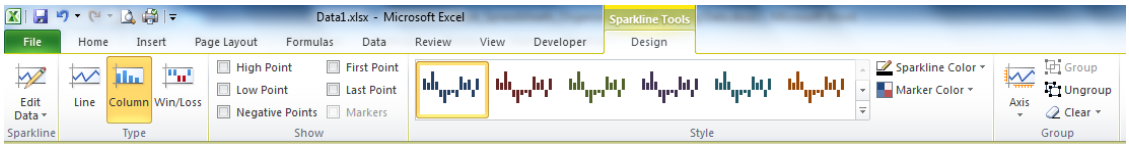


Figure 60: Sparklines Tools Design ribbon

11.2. Apply a common vertical axis to a Sparkline group

The Sparklines that are initially created provide a snapshot of a single row of data. The minimum and maximum values are set based on each individual rows values. Sometimes this may not be helpful and it will be appropriate to group the Sparklines together and show them in proportion the full data set.

An example of this can be seen in the Sparklines originally created and has been highlighted in Figure 61 below

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	Company	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
2	Buttons & Pins	£1,386.99	£3,227.19	£2,639.80	£5,932.62	£233.00	£357.99	£2,984.69	£233.00	£1,950.30	£4,687.30	£3,123.40	£4,034.65		
3	Comp. Stores	£348.00	£3,912.10	£1,394.91	£3,540.50	£4,536.00	£1,141.47	£2,452.65	£1,464.21	£2,541.30	£2,742.24	£2,535.39			
4	Fixit Ltd	£4,935.35	£7,864.20	£4,710.27	£7,026.68	£6,994.60	£4,099.52	£498.00	£947.00	£3,386.27	£4,725.40	£3,993.80	£1,683.99		
5	Hardcopy stores	£2,037.39	£3,571.81	£5,154.63	£9,148.72	£2,324.60	£7,750.60	£4,681.20	£4,527.06	£4,902.49	£693.10	£2,704.81	£3,739.37		
6	PerfectWord	£3,276.66	£1,375.11	£1,054.35	£2,144.35	£1,287.66	£4,287.35	£2,357.11	£2,642.76	£4,326.30	£4,133.45				
7	Plugs and Sockets	£3,855.10	£1,976.04	£1,058.31	£2,700.35	£2,908.71	£4,737.03	£646.00	£2,736.33	£1,941.39	£4,686.35	£3,032.22	£5,575.70		
8	Sitting Pretty		£4,118.25	£2,550.17	£2,160.11	£4,680.21	£5,287.05	£4,049.85	£6,181.68	£4,155.35	£848.25	£2,445.76	£3,033.19		

Figure 61: Snapshot of a single row of data in to create a Sparkline

From Figure 1 Buttons & Pins has sales of £5932.62 in April and Hardcopy stores has £9148.72. Looking at the column Sparkline the sales column for April look similar for both companies and therefore the Sparkline may be considered misleading.

The Sparklines can be grouped together and a common maximum and minimum value can be set for all Sparklines. To achieve this:

- Click onto any of the Column Sparklines, on Figure 61 above this will be any Sparklines in column O.

A thin blue line should appear around all the column Sparklines, this is because Excel considers all Sparklines as a Sparkline Group so any changes that are made using the **Sparkline Tools Design** will apply to all Sparklines in the group.

- Click on **Sparkline Tools | Design | Group | Axis** drop-down, the below menu will appear, see Figure 62: Axis drop down menu

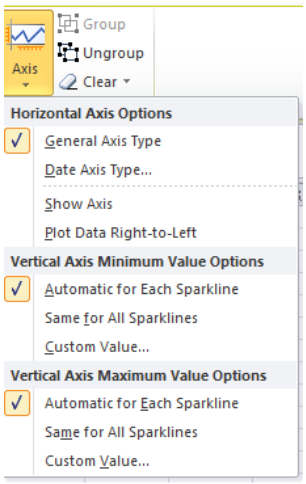


Figure 62: Axis drop down menu

- Click **Vertical Axis Minimum Value Options | Same for All Sparklines**
- Click **Vertical Axis Maximum Value Options | Same for All Sparklines**

The Sparklines will then change, see Figure 63: Sparklines with same axis as Sparkline group

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	Company	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
2	Buttons & Pins	£1,386.99	£3,227.19	£2,639.80	£5,932.62	£233.00	£357.99	£2,984.69	£233.00	£1,950.30	£4,687.30	£3,123.40	£4,034.65		
3	Comp. Stores	£348.00	£3,912.10	£1,394.91	£3,540.50	£4,536.00	£1,141.47	£2,452.65	£1,464.21	£2,541.30	£2,742.24	£2,535.39			
4	Fixit Ltd	£4,935.35	£7,864.20	£4,710.27	£7,026.68	£6,994.60	£4,099.52	£498.00	£947.00	£3,386.27	£4,725.40	£3,993.80	£1,683.99		
5	Hardcopy stores	£2,037.39	£3,571.81	£5,154.63	£9,148.72	£2,324.60	£7,750.60	£4,681.20	£4,527.06	£4,902.49	£693.10	£2,704.81	£3,739.37		
6	PerfectWord	£3,276.66	£1,375.11	£1,054.35	£2,144.35	£1,287.66	£4,287.35	£2,357.11	£2,642.76	£4,326.30	£4,133.45				
7	Plugs and Sockets	£3,855.10	£1,976.04	£1,058.31	£2,700.35	£2,908.71	£4,737.03	£646.00	£2,736.33	£1,941.39	£4,686.35	£3,032.22	£5,575.70		
8	Sitting Pretty		£4,118.25	£2,550.17	£2,160.11	£4,680.21	£5,287.05	£4,049.85	£6,181.68	£4,155.35	£848.25	£2,445.76	£3,033.19		

Figure 63: Sparklines with same axis as Sparkline group

11.3. Deleting Sparklines

Sparklines can be deleted two ways.

- Delete the column of data where they are located.

OR

- Select the Sparkline group
- Click **Sparkline Tools Design | Group | Clear | Clear Selected Sparkline Groups**

Exercise 24: Create Office 2013 Sparklines

Now look at this exercise (page 106)

12 Exercises

Exercise 1 Convert a Range of data to a Table

- *Create a table from an existing range – See Section 2.2.3*
- *Name your table - See Section 2.2.3*
- *Format the table - See Section 2.2.4*
- *Add totals and change the totals calculation - See Section 2.2.5*
- *Remove table styles and convert the table back to a range - See Section 2.2.6*

Task 1

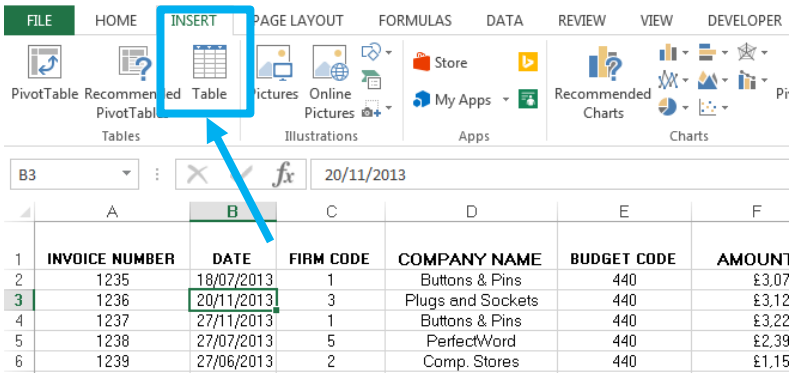
This task is to convert your existing data from a range to a table.

Step 1

Open **Data1.xlsx** from the **H:** drive.

Click anywhere inside the list in the **Sales 2013** worksheet.

Select the **Insert** tab on the **Ribbon** click **Tables | Table.**



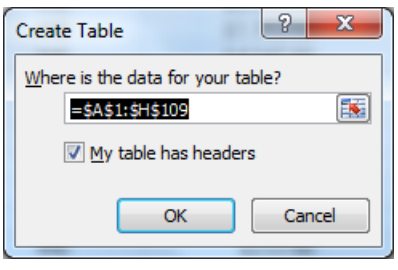
Convert a range to a table

Step 2

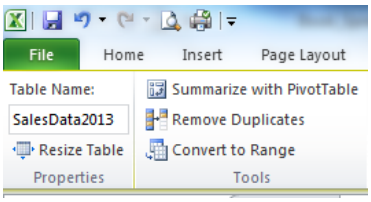
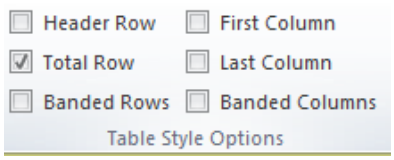
The **Create Table** dialog box will now appear.

In the **Where is the data for your table?** Text box make sure the cell reference is **=$A$1:$H$109**. By default, if you click inside the list in the worksheet then the **Create Table** dialog box will show the correct range automatically.

Click **OK**



Create Table dialogue box

Task 2 Name your table	Step 1 Give your table a meaningful name. On the **Table Tools | Design** tab in the **Properties** section click into the **Table Name:** box and type **SalesData2013**.  Name table
Task 3 Format the table to a preferred style	Step 1 To format your table you need to ensure that your table is selected. Click anywhere within your data. If your table is selected the **Table Tools | Design** will become available on the ribbon. Select a style from the **Table Styles** tab.  Table Styles tab
Task 4 You require totals, add a total row to your table	Step 1 Currently your table does not contain any total rows. Tables have a built in facility to add a total row, you do not need to insert a formula. Click anywhere inside the table and from the **Table Tools Design** tab select **Table Styles Options.** Point and click in the box to insert a tick by **Total Row**  Table Style Options Totals will now appear, by default in the right-most column. The default calculation for number values will be SUM and for text values COUNT.

Task 5

Insert further calculations to the totals row

Step 1

Add in the SUM of the Amount and Discount column and COUNT the number of entries.

To add or change a total in the total row from click in a cell in the total row and a drop down arrow will appear. Select either a new or alternative calculation function from the list.

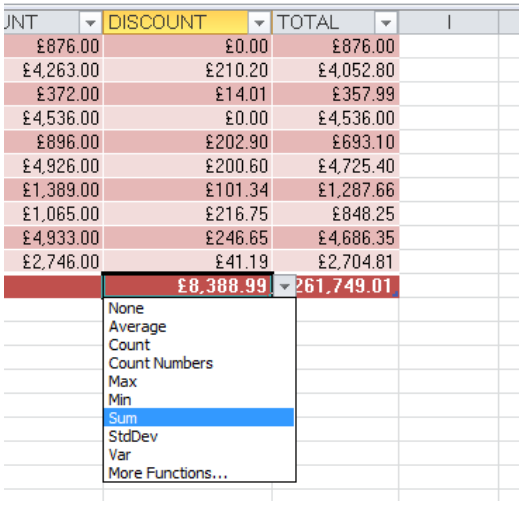


Table functions list

Click into row *110* in the *Discount* column, click on the drop down arrow to the right of the cell and select **Sum**

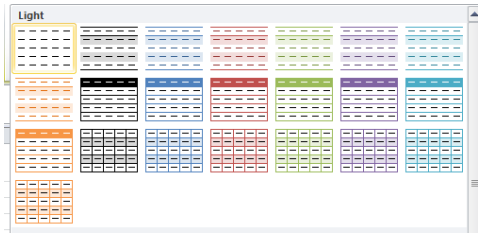
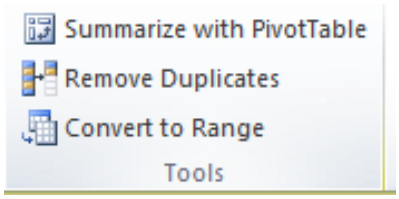
Click into *Amount* total cell in row *110* and insert a **Sum** total here too.

Click into *Budget Code* column, row *110* and select **Count** from the drop down menu.

Your table total should look like below

BUDGET COD	AMOUNT	DISCOUNT	TOTAL
444	£4,536.00	£0.00	£4,536.00
446	£896.00	£202.90	£693.10
446	£4,926.00	£200.60	£4,725.40
446	£1,389.00	£101.34	£1,287.66
446	£1,065.00	£216.75	£848.25
440	£4,933.00	£246.65	£4,686.35
440	£2,746.00	£41.19	£2,704.81
108	**£270,138.00**	**£8,388.99**	**£261,749.01**

Completed Table totals

Task 6 You want to convert your table back to a range. Remove table styles and convert back to a range	Step 1 It is advisable that before converting a table back into a range the table formatting is removed. Click anywhere inside the table. Click **Table Tools | Design | Table Styles | More | Light**.  Remove Table Styles To convert your Table back to a Range, click anywhere inside the table and from the **Table Tools Design** tab select **Tools | Convert to Range**.  Convert to Range You may notice that the total row (row 110) still appears at the bottom of your data and a formula has been inserted.
Task 7 Save your file	Step 1 Save your file to the H drive.

Exercise 2 Using AutoFilter

- Apply an AutoFilter - *See Section 3.1*
- Filter using multiple criteria - *See Section 3.1*
- Apply a Custom Filter - *See Section 3.1*

Task 1

Use the AutoFilter locate the sales for the company **`Buttons & Pins`**.

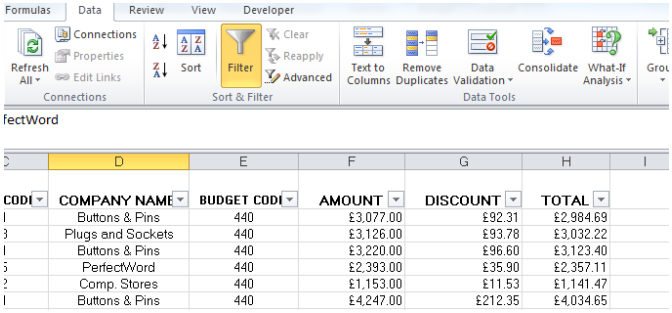
Step 1

Work on the file you previously saved, having completed Exercise 1 (**`Data1.xlsx`**) or if you did not manage to complete the previous task open the file

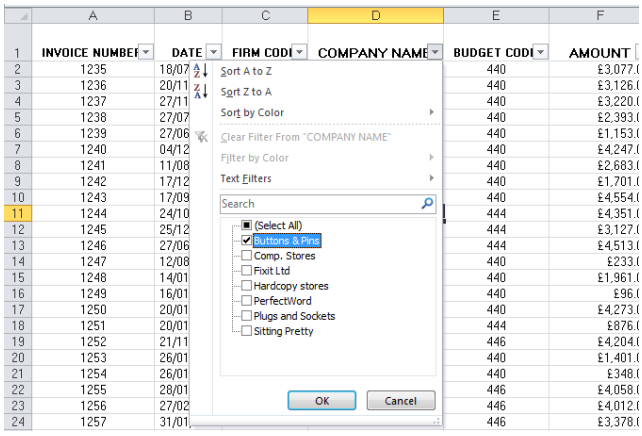
`Data1 Ex1 Completed.xlsx`

Step 2

Click any cell in your range of data. Select the **Data** tab then **Filter** (from the **Sort & Filter** category). The AutoFilter feature is now active and drop-down arrows appear on each column label like below.



Click in the Company Name field, point and click at the arrow in the heading and from the drop down list remove the tick from **`Select All`**, insert a tick to **`Buttons & Pins`**



Notice the list has now filtered and only records for **`Buttons & Pins`** appear (the rest are hidden).. The total row is also still visible and this is now totalling only the visible items.

Look at the row numbers, you will see that row numbers are missing, which are the hidden rows.

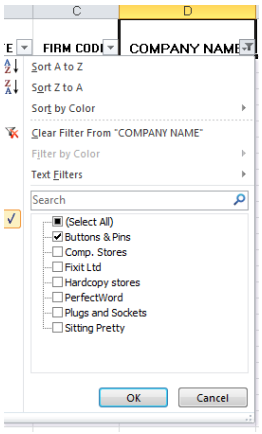
	A	B	C	D	E
1	INVOICE NUMBEF	DATE	FIRM CODI	COMPANY NAME	BUDGET CODI
2	1235	18/07/2013	1	Buttons & Pins	440
4	1237	27/11/2013	1	Buttons & Pins	440
7	1240	04/12/2013	1	Buttons & Pins	440
14	1247	12/08/2013	1	Buttons & Pins	440
20	1253	26/01/2013	1	Buttons & Pins	440
28	1262	09/09/2013	1	Buttons & Pins	441
29	1263	11/02/2013	1	Buttons & Pins	442
30	1264	12/10/2013	1	Buttons & Pins	444
31	1265	13/03/2013	1	Buttons & Pins	446
32	1266	14/04/2013	1	Buttons & Pins	446
33	1267	19/04/2013	1	Buttons & Pins	446
96	1331	29/05/2013	1	Buttons & Pins	440
102	1337	17/06/2013	1	Buttons & Pins	440
110	Total				13

Also notice that a filter icon  has appeared above the **`Company Name`** column to show this column contains filtered data.

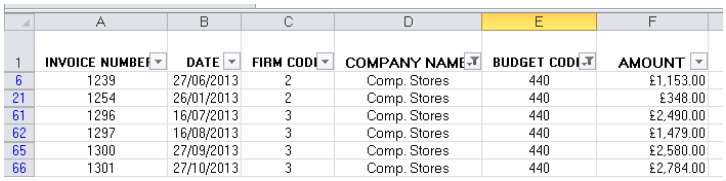
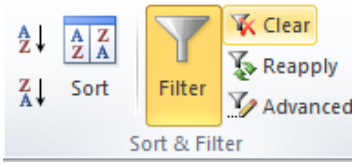
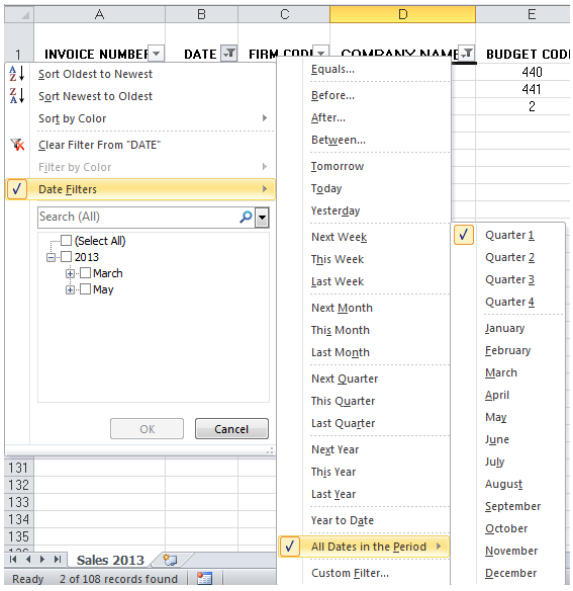
Remove the Filter from Company Name (single column)

Step 3

To remove the filter from a single column, click into the column Company Name and click on the drop down filter arrow. Either select **(Select All)** from the column's drop down list or select **Clear Filter From "COMPANY NAME"** which has a clear filter icon alongside. 

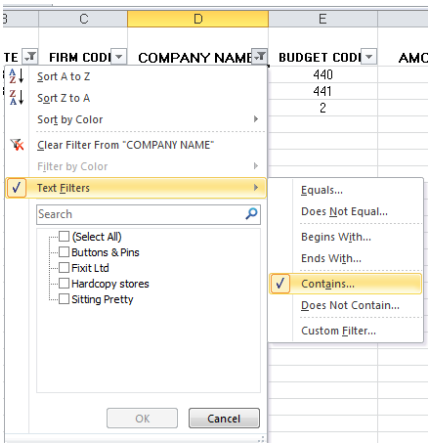


All rows in the list should now be visible.

Filter the list to show **Comp. Stores** records with a budget code of **440**.	Step 4 Select the drop down list for **Company Name**, select **Comp. Stores** Now select the drop down list for **Budget Code** and select the code **440** The filtered data should only show the following 6 records. 
Remove all Filters	Step 5 To clear all the filters which have been applied, select **Data | Sort & Filter | Clear** from the ribbon. 
Use the data type filters to locate sales in Quarter 1, for Amounts between £2000 and £3000 for any Ltd Companies.	Step 6 Click into the Date column and from the drop down filter arrow select **Date Filters | All Dates in the Period | Quarter 1.** 

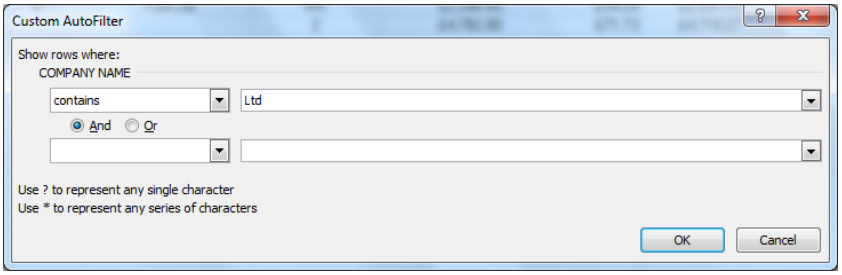
Step 7

Click into the Company Name column and from the drop down filter arrow select **Text Filters | Contains…**



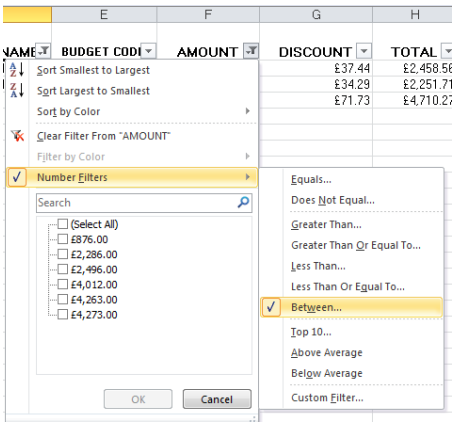
The **Custom AutoFilter** dialog will appear and in the empty text box to the right of **contains** type **`Ltd`.**

Click on **OK**



Step 8

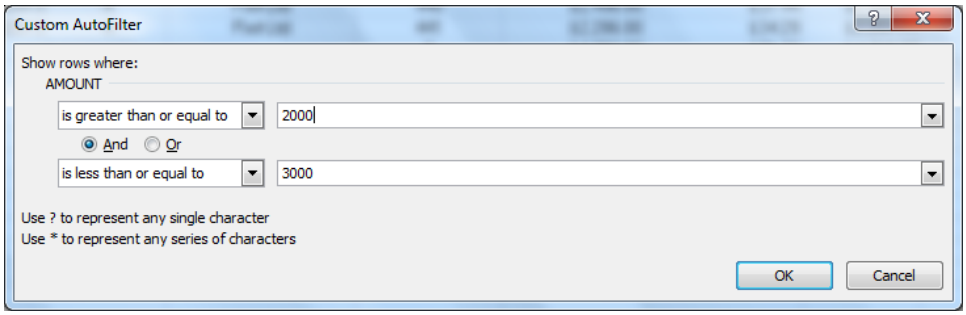
Now click in the **Amount** column and from the drop down list select **Number Filters | Between**



Step 9

The **Custom AutoFilter** dialog will appear again. In the empty text box to the right of **is greater than or equal to** type **2000** and in the text box to the right of **is less than or equal to** type **3000**

Click on **OK**



Your filtered data should look like the example below.

	A	B	C	D	E	F
1	INVOICE NUMBEF	DATE	FIRM CODI	COMPANY NAME	BUDGET CODI	AMOUNT
43	1277	22/03/2013	4	Fixit Ltd	440	£2,496.00
45	1279	30/03/2013	4	Fixit Ltd	441	£2,286.00
110	Total				2	£4,782.00

Step 10

Remove the filters.

Click on **Data | Sort & Filter | Filter** to remove the drop down arrows for the column headings.

Save the file.

Exercise 3 Filter by Selection and Top 10 AutoFilter

- *Apply a Filter by Selection - See Section 3.2*
- *Apply a Top 10 AutoFilter - See Section 3.3*

Task 1

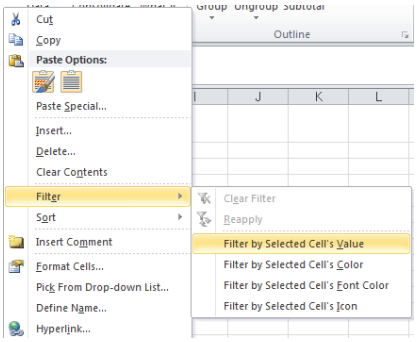
You would like to quickly see how many companies received zero discount. Use Filter by Selection

Step 1

Work on the file you previously saved, having completed Exercise 2 (**`Data1.xlsx`**) or if you did not complete the previous task open the file

`Data1 Ex1 completed.xlsx`

Click and select a cell in the Discount column which contains the value of £0.00. Right click on this cell and select **Filter | Filter by Selected Cells Value**



Your results should look similar to below

	A	B	C	D	E	F	G	H
1	INVOICE NUMBEF	DATE	FIRM CODI	COMPANY NAME	BUDGET CODI	AMOUNT	DISCOUNT	TOTAL
14	1247	12/08/2013	1	Buttons & Pins	440	£233.00	£0.00	£233.00
16	1249	16/01/2013	3	Hardcopy stores	440	£96.00	£0.00	£96.00
18	1251	20/01/2013	4	Fixit Ltd	444	£876.00	£0.00	£876.00
21	1254	26/01/2013	2	Comp. Stores	440	£348.00	£0.00	£348.00
27	1261	06/02/2013	3	Hardcopy stores	446	£867.00	£0.00	£867.00
44	1278	27/08/2013	4	Fixit Ltd	441	£947.00	£0.00	£947.00
53	1287	24/04/2013	3	Plugs and Sockets	442	£622.00	£0.00	£622.00
71	1306	19/07/2013	3	Fixit Ltd	446	£498.00	£0.00	£498.00
75	1310	28/06/2013	3	Sitting Pretty	440	£785.00	£0.00	£785.00
77	1312	03/07/2013	3	Hardcopy stores	442	£372.00	£0.00	£372.00
79	1314	14/12/2013	3	Plugs and Sockets	446	£896.00	£0.00	£896.00
84	1319	20/12/2013	3	Hardcopy stores	440	£130.00	£0.00	£130.00
86	1321	30/07/2013	3	Plugs and Sockets	440	£646.00	£0.00	£646.00
94	1329	25/08/2013	6	Sitting Pretty	440	£263.00	£0.00	£263.00
96	1331	29/05/2013	1	Buttons & Pins	440	£233.00	£0.00	£233.00
98	1333	03/09/2013	3	Sitting Pretty	440	£96.00	£0.00	£96.00
100	1335	08/05/2013	4	Fixit Ltd	444	£876.00	£0.00	£876.00
103	1338	10/05/2013	2	Comp. Stores	444	£4,536.00	£0.00	£4,536.00
110	Total				18	£13,320.00	£0.00	£13,320.00

Step 2

Clear the filter from the Discount field.

Either select **(Select All)** from the DISCOUNT column drop down list or select **Clear Filter From "DISCOUNT"** which has a clear filter icon alongside.

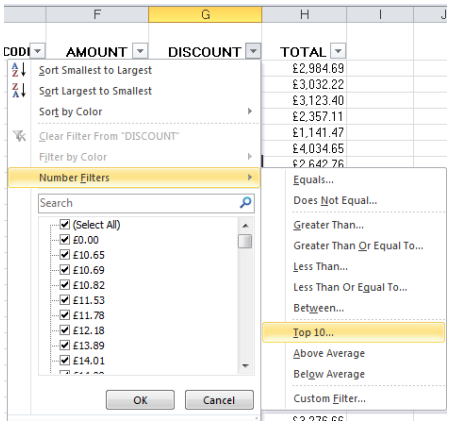
The filter drop down arrows will remain on the column headings.

Task 2

Locate the 5 highest amounts of discount.

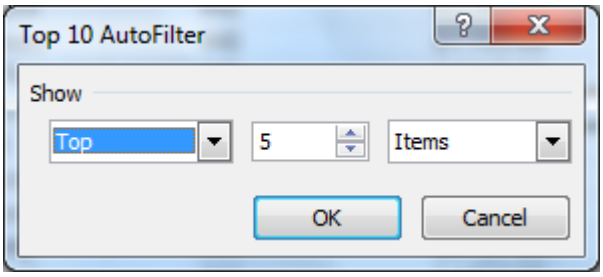
Step 1

Click on the drop down arrow next to DISCOUNT and select **Number Filters | Top 10**



Step 2

The **Top 10 AutoFilter** dialog will appear. Change the number to 5 and click on **OK**



Your results should look similar to below

	A	B	C	D	E	F	G	H
1	INVOICE NUMBEF	DATE	FIRM CODI	COMPANY NAME	BUDGET CODI	AMOUNT	DISCOUNT	TOTAL
10	1243	17/09/2013	5	PerfectWord	440	£4,554.00	£227.70	£4,326.30
30	1264	12/10/2013	1	Buttons & Pins	444	£4,934.00	£246.70	£4,687.30
58	1293	07/06/2013	6	Sitting Pretty	442	£4,739.00	£236.95	£4,502.05
80	1315	14/12/2013	3	Plugs and Sockets	446	£4,926.00	£246.30	£4,679.70
108	1343	23/10/2013	3	Plugs and Sockets	440	£4,933.00	£246.65	£4,686.35
110	Total				5	£24,086.00	£1,204.30	£22,881.70
111								

Step 3

Remove the filters.

Click on **Data | Sort & Filter | Clear** to remove the filters. The drop down filter arrows should still appear above each column heading.

Save the file.

Exercise 4 Filter by colour

- *Apply an AutoFilter - See Section 3.4*
- *Filter by cell fill colour and text colours - See Section 3.4*

Task 1

Filter Budget Code 440 (coloured orange) and amounts >1000 and <=2000 (coloured in pink) using the filter by colour option.

Step 1

Open the file named **Colour Filter.xlsx**

Step 2

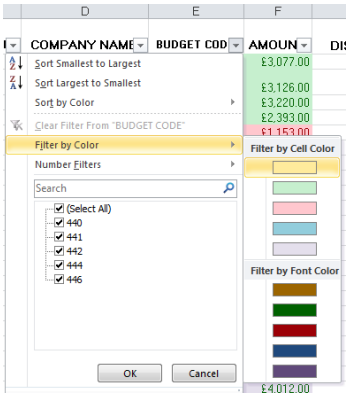
From the **Data | Sort & Filter** menu select **Filter**.

Drop down arrows will now appear above each column heading

Step 3

Select the drop down arrow in the **Budget Code** column and select **Filter by Colour**

Select the **orange** fill colour from the **Filter by Cell Colour** drop down list



Step 4

Select the drop down arrow in the **Amount** column and select **Filter by Colour**

Select the **pink Filter by Cell Colour** from the drop down list

Your spreadsheet should look similar to below.

VOICE NUMBE	DATE	FIRM CODI	COMPANY NAME	BUDGET COD	AMOUN	DISCOUNT	TOTAL
1239	27/06/2013	2	Comp. Stores	440	£1,153.00	£11.53	£1,141.47
1242	17/12/2013	4	Fixit Ltd	440	£1,701.00	£17.01	£1,683.99
1248	14/01/2013	3	Hardcopy stores	440	£1,961.00	£19.61	£1,941.39
1253	26/01/2013	1	Buttons & Pins	440	£1,401.00	£14.01	£1,386.99
1271	24/09/2013	3	Hardcopy stores	440	£1,994.00	£19.94	£1,974.06
1274	02/03/2013	3	Hardcopy stores	440	£1,506.00	£15.06	£1,490.94
1286	21/04/2013	3	Hardcopy stores	440	£1,552.00	£15.52	£1,536.48
1297	16/08/2013	3	Comp. Stores	440	£1,479.00	£14.79	£1,464.21
1299	16/05/2013	3	Fixit Ltd	440	£1,892.00	£18.92	£1,873.08
1308	20/06/2013	3	Plugs and Sockets	440	£1,178.00	£11.78	£1,166.22
1309	25/06/2013	3	Plugs and Sockets	440	£1,218.00	£12.18	£1,205.82
1316	15/02/2013	5	PerfectWord	440	£1,389.00	£13.89	£1,375.11
1332	02/09/2013	3	Plugs and Sockets	440	£1,961.00	£19.61	£1,941.39
Total				13	20385	£203.85	£20,181.15

Task 2

Save and close your file

Exercise 5 Using the Advanced Filter

- *Set a criteria range - See Section 3.6.1*
- *Set a filter using multiple AND / OR criteria - See Section 3.6.2*

Task 1

In this task you will locate records with a **Budget code** of **444** OR for a **Budget code** of **440** where the **Total** is **greater than 4000**

Step 1

Work on the file **Data1.xlsx** which you previously saved in Exercise 3 or if you did not complete Exercise 3 open the file

Data1 Ex1 Completed.xlsx

Step 2

Set up a criteria range to use the **Advanced Filter** option

To create a criteria range insert rows above your data to allow for the column headings two rows for your criteria for this example and one blank row, so 4 rows in total.

Click and select the row numbers 1 to 4 so the row contents are highlighted and then right click and select **Insert**. 4 rows will have now been inserted.

Copy the column headings now located in row 5 to row 1. Your spreadsheet will look similar to below.

	A	B	C	D	E	F	G	H
1	INVOICE NUMBER	DATE	FIRM CODE	COMPANY NAME	BUDGET CODE	AMOUNT	DISCOUNT	TOTAL
2								
3								
4								
5	INVOICE NUMBER	DATE	FIRM CODE	COMPANY NAME	BUDGET CODE	AMOUNT	DISCOUNT	TOTAL
6	1235	18/07/2013	1	Buttons & Pins	440	£3,077.00	£92.31	£2,984.69
7	1236	20/11/2013	3	Plugs and Sockets	440	£3,126.00	£93.78	£3,032.22
8	1237	27/11/2013	1	Buttons & Pins	440	£3,220.00	£96.60	£3,123.40
9	1238	27/07/2013	5	PerfectWord	440	£2,393.00	£35.90	£2,357.11
10	1239	27/06/2013	2	Comp. Stores	440	£1,153.00	£11.53	£1,141.47
11	1240	04/12/2013	1	Buttons & Pins	440	£4,247.00	£212.35	£4,034.65
12	1241	11/08/2013	5	PerfectWord	440	£2,683.00	£40.25	£2,642.76

Task 2

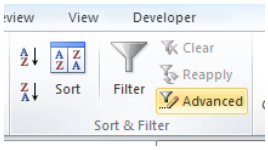
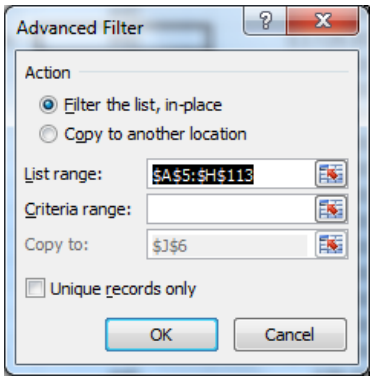
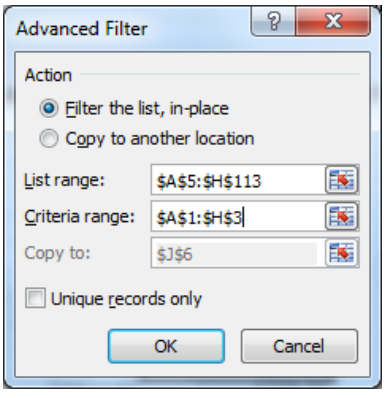
Enter the criteria to the range

Step 1

- Enter criteria **440** immediately underneath the column heading *Budget Code* within the criteria range, in the above example this is cell F2.
- Enter the criteria >**4000** underneath the *Total* column heading in the criteria range, ensure it is on the same row as the *Budget code* 440 criteria.
- Enter criteria **444** underneath the previously entered criteria of **440** in the Budget code column.

The criteria will look as below

	A	B	C	D	E	F	G	H	I
1	INVOICE NUMBER	DATE	FIRM CODE	COMPANY NAME	BUDGET CODE	AMOUNT	DISCOUNT	TOTAL	
2					440			>4000	
3					444				
4									
5	INVOICE NUMBER	DATE	FIRM CODE	COMPANY NAME	BUDGET CODE	AMOUNT	DISCOUNT	TOTAL	
11	1240	04/12/2013	1	Buttons & Pins	440	£4,247.00	£212.35	£4,034.65	
14	1243	17/09/2013	5	PerfectWord	440	£4,554.00	£227.70	£4,326.30	
15	1244	24/10/2013	5	PerfectWord	444	£4,351.00	£217.55	£4,133.45	

Task 3 Run the Advanced Filter	Step 1 Click within the data set, which is from row 6 onwards. From the ribbon menu select **Data | Sort&Filter | Advanced**  The **Advanced Filter** dialog box will appear. 
	Step 2 • Click on the collapse dialog box to the right of the **Criteria range:** • Select cells A1:H3. Do not include the blank row as the filter will not then work. • Click on the collapse dialog box again to return to the **Advanced Filter** dialog box. The **Advanced Filter** dialog box should now show the criteria range set as below
	Step 3 

- Click on **OK** to filter the data.

Your data will be similar to below.

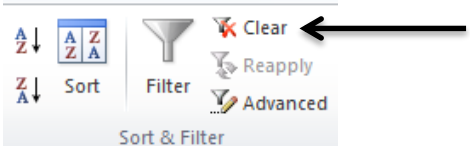
	A	B	C	D	E	F	G	H	I
1	INVOICE NUMBER	DATE	FIRM CODE	COMPANY NAME	BUDGET CODE	AMOUNT	DISCOUNT	TOTAL	
2					440			>4000	
3					444				
4									
5	INVOICE NUMBER	DATE	FIRM CODE	COMPANY NAME	BUDGET CODE	AMOUNT	DISCOUNT	TOTAL	
11	1240	04/12/2013	1	Buttons & Pins	440	£4,247.00	£212.35	£4,034.65	
14	1243	17/09/2013	5	PerfectWord	440	£4,554.00	£227.70	£4,326.30	
15	1244	24/10/2013	5	PerfectWord	444	£4,351.00	£217.55	£4,133.45	
16	1245	25/12/2013	6	Sitting Pretty	444	£3,127.00	£93.81	£3,033.19	
17	1246	27/06/2013	5	PerfectWord	444	£4,513.00	£225.65	£4,287.35	
21	1250	20/01/2013	4	Fixit Ltd	440	£4,273.00	£213.65	£4,059.35	
22	1251	20/01/2013	4	Fixit Ltd	444	£876.00	£0.00	£876.00	
34	1264	12/10/2013	1	Buttons & Pins	444	£4,934.00	£246.70	£4,687.30	
40	1270	23/04/2013	2	Comp. Stores	444	£3,650.00	£109.50	£3,540.50	
54	1284	18/04/2013	4	Sitting Pretty	444	£2,193.00	£32.90	£2,160.11	
93	1324	10/08/2013	3	Plugs and Sockets	444	£2,778.00	£41.67	£2,736.33	
95	1326	22/06/2013	4	Fixit Ltd	444	£1,082.00	£10.82	£1,071.18	
99	1330	26/08/2013	6	Sitting Pretty	444	£2,634.00	£39.51	£2,594.49	
103	1334	04/09/2013	4	Sitting Pretty	440	£4,273.00	£213.65	£4,059.35	
104	1335	08/05/2013	4	Fixit Ltd	444	£876.00	£0.00	£876.00	
107	1338	10/05/2013	2	Comp. Stores	444	£4,536.00	£0.00	£4,536.00	
112	1343	23/10/2013	3	Plugs and Sockets	440	£4,933.00	£246.65	£4,686.35	
114	Total				17	£57,830.00	£2,132.11	£55,697.90	
115									
116									

Task 4

Remove the filter

Step 1

- Select **Data | Clear** to remove the filter from the **Sort&Filter** category.



Exercise 6 Using Advanced Filter to extract a unique records list

- *Create a list of unique records in the same worksheet - See Section 3.6.3*
- *Create a list of unique records on a different worksheet - See Section 3.6.4*

Task 1

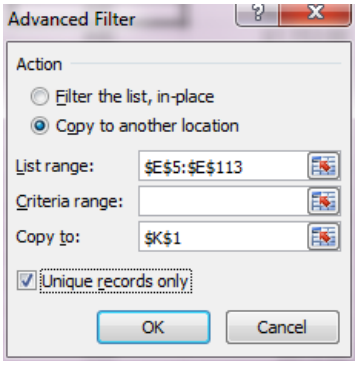
Extract a unique list of **Budget Codes** to cell K1

Step 1

Continue to use your file **Data1.xlsx** or if you did not complete the previous exercise then open the file **Data1 Ex5 completed.xlsx**

Click into the table/range of data and select **Data | Sort and Filter | Advanced filter.**

The **Advanced Filter** dialog box will appear.



You then have an option to **Filter the list in-place** or **Copy to another location**. Select **Copy to another location**

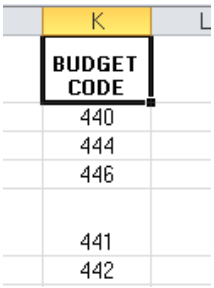
The **List range** is the column of data you would like to locate a unique set of records from. For this exercise it is the *Budget Codes* which are in range E5:E113. Note that row 114 contains totals and you do not want to include this row in your unique value list. If you inadvertently select this and it is included in your unique list then you can then delete it from there.

The **Criteria range** can be left blank.

In the **Copy to** text box click into cell K1 in your existing worksheet and the cell reference will be inserted for you.

Add a tick to the **Unique records only** check box and click the **OK** button.

A unique list of **Budget Codes** will be placed into cell K1 as below. If the number 108 is also included in this list then you also included the total row in your selection. This can be deleted from the list so it will then be the same as below.

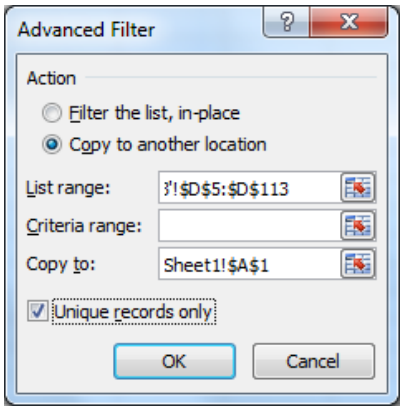


Task 2

Extract a unique list of **Company Names** to cell a new worksheet cell A1

Step 1

Click into a new worksheet, cell A1, where you would like your list to be placed. Select **Data | Sort and Filter | Advanced filter.** The Advanced Filter dialog box will appear.



Select **Copy to another location**

The **List range** is the column of data you would like to locate a unique set of records from. You will now need to click into the *Sales 2013* worksheet where your list is located and select cells D5:D113 which hold the *Company Names*.

The **Criteria range** can be left blank.

Select the **Copy to** text box and the new worksheet you originally selected will open. Click into cell A1 in this worksheet and the worksheet and cell reference will be inserted for you.

Add a tick to the **Unique records only** check box and click the **OK** button

A unique list of **Company Names** will be placed into worksheet **Sheet1**, cell **A1** as below. Rename the worksheet **Data Lists**

	A	B
1	COMPANY NAME	
2	Buttons & Pins	
3	Plugs and Sockets	
4	PerfectWord	
5	Comp. Stores	
6	Fixit Ltd	
7	Sitting Pretty	
8	Hardcopy stores	
9		

Step 2

Now move the unique list of **Budget Codes** from the worksheet **Sales 2013** cells K1 to K6 to the newly named **Data Lists** worksheet starting in cell C1

Task 3

Save your file

Exercise 7 Subtotalling data in a range

- *Sort the data - See Section 4.1.1*
- *Sum the Amount sold for each Company - See Section 4.1.2*
- *Count the Budget Code field within each Company - See Section 4.1.3*

Task 1

Produce subtotals to show how much each Company has purchased before discount and count each Budget Code purchased by each Company

Step 1

Work on the file you previously saved, having completed Exercise 6 (**Data1.xlsx**) or if you did not complete Exercise 6 open the file

Data1 Ex6 Completed.xlsx

Task 2

Sort the data by **Company** and then by **Budget Code**

Step 1

As you are now inserting subtotals remove the previously inserted totals from row 114

Sort the range by **Company Name** and then by **Budget Code.**

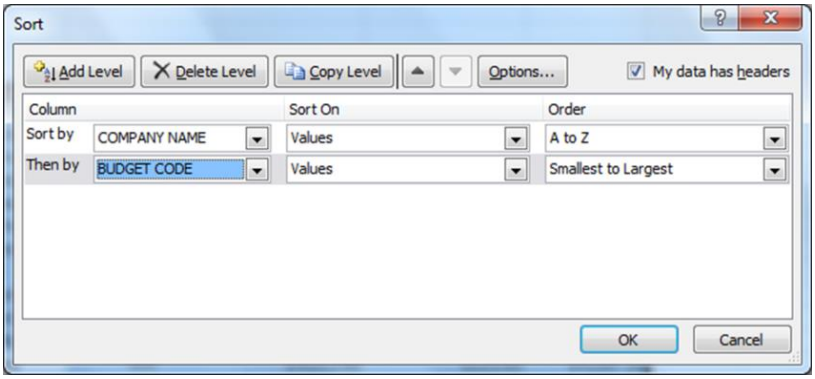
Click in the range of data and select **Data | Sort and Filter |**  and the **Sort** dialog box will appear.

Select **Company Name** from the **Sort by list** and the **Order** can be left as *A to Z*. Select **Add Level.**

In the **Then by** box select **Budget Code** from the drop down list and the **Order** can be left as *Smallest to Largest*

Your Sort dialog will look like below

Select **OK**

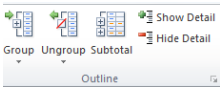


Task 3

Insert subtotals to show the total **Amount** sold per **Company** before discount.

Step 1

Click into your data range then select **Data | Outline | Subtotal** on the ribbon.



The Subtotal dialog box will now appear.

Step 2

The **At each change in:** the box will automatically display the label of the leftmost column.

Click the drop-down arrow and select **Company Name**

Step 3

The **Use function:** box displays the summary function to be used. Ensure the **Sum** function is selected. To change the function you can click on the drop down arrow and select a function.

Step 4

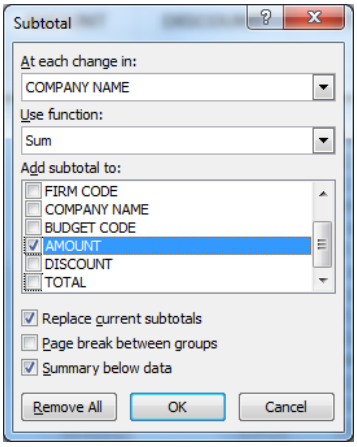
The **Add subtotal to:** box displays the label of the rightmost column or the label of the column last selected. Labels that are checked in this box will be subtotalled.

Deselect **Total** by clicking in the check box beside it and removing the tick. Add a tick beside the **Amount** check box. Make sure no other column labels are checked.

Step 5

Indicate the position of the summary totals by clicking the **Summary below data** box. The subtotals will appear above the data values unless this box is checked.

Note: The **Replace current subtotals** checkbox should be checked at this point to ensure any previous subtotals are overwritten.



Step 6

Select OK for the range to be subtotalled.

Your spreadsheet will look similar to below

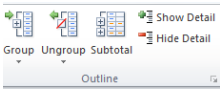
	A	B	C	D	E	F	G	H
4								
5	INVOICE NUMBER	DATE	FIRM CODE	COMPANY NAME	BUDGET CODE	AMOUNT	DISCOUNT	TOTAL
6	1235	18/07/2013	1	Buttons & Pins	440	£3,077.00	£92.31	£2,984.69
7	1237	27/11/2013	1	Buttons & Pins	440	£3,220.00	£96.60	£3,123.40
8	1240	04/12/2013	1	Buttons & Pins	440	£4,247.00	£212.35	£4,034.65
9	1247	12/08/2013	1	Buttons & Pins	440	£233.00	£0.00	£233.00
10	1253	26/01/2013	1	Buttons & Pins	440	£1,401.00	£14.01	£1,386.99
11	1331	29/05/2013	1	Buttons & Pins	440	£233.00	£0.00	£233.00
12	1337	17/06/2013	1	Buttons & Pins	440	£372.00	£14.01	£357.99
13	1262	09/09/2013	1	Buttons & Pins	441	£1,970.00	£19.70	£1,950.30
14	1263	11/02/2013	1	Buttons & Pins	442	£3,327.00	£99.81	£3,227.19
15	1264	12/10/2013	1	Buttons & Pins	444	£4,934.00	£246.70	£4,687.30
16	1265	13/03/2013	1	Buttons & Pins	446	£2,680.00	£40.20	£2,639.80
17	1266	14/04/2013	1	Buttons & Pins	446	£4,110.00	£205.50	£3,904.50
18	1267	19/04/2013	1	Buttons & Pins	446	£2,059.00	£30.89	£2,028.12
19				**Buttons & Pins Total**		£31,863.00		
20	1239	27/06/2013	2	Comp. Stores	440	£1,153.00	£11.53	£1,141.47
21	1254	26/01/2013	2	Comp. Stores	440	£348.00	£0.00	£348.00
22	1296	16/07/2013	3	Comp. Stores	440	£2,490.00	£37.35	£2,452.65
23	1297	16/08/2013	3	Comp. Stores	440	£1,479.00	£14.79	£1,464.21
24	1300	27/09/2013	3	Comp. Stores	440	£2,580.00	£38.70	£2,541.30
25	1301	27/10/2013	3	Comp. Stores	440	£2,784.00	£41.76	£2,742.24
26	1268	19/02/2013	2	Comp. Stores	441	£4,118.00	£205.90	£3,912.10
27	1269	19/03/2013	2	Comp. Stores	442	£1,409.00	£14.09	£1,394.91
28	1303	28/11/2013	3	Comp. Stores	442	£2,574.00	£38.61	£2,535.39
29	1270	23/04/2013	2	Comp. Stores	444	£3,650.00	£109.50	£3,540.50
30	1338	10/05/2013	2	Comp. Stores	444	£4,536.00	£0.00	£4,536.00
31				**Comp. Stores Total**		£27,121.00		

Task 4

Re subtotal the range to Count each Budget Code purchased per Company. Your previous subtotals need to remain.

Step 1

Click into your data range then select **Data | Outline | Subtotal** on the ribbon.



The Subtotal dialog box will now appear.

Step 2

At each change in click the drop-down arrow and select **Budget Code**

Step 3

In the **Use function** box ensure the **Count** function is selected. To change the function click on the drop down arrow and select a function.

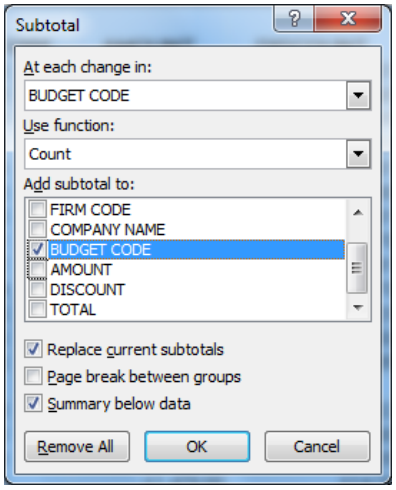
Step 4

In the **Add subtotal to** box deselect **Amount** by clicking in the check box beside it and removing the tick. Add a tick beside the **Budget Code** check box. Make sure no other column labels are checked.

Step 5

Indicate the position of the summary totals by clicking the **Summary below data** box. The subtotals will appear above the data values unless this box is checked.

Note: This time the **Replace current subtotals** checkbox should be unchecked to ensure any previous subtotals are not overwritten.



Step 6

Select **OK** for the range to be subtotalled.

Your spreadsheet will look similar to below.

	A	B	C	D	E	F	G	H
5	INVOICE NUMBER	DATE	FIRM CODE	COMPANY NAME	BUDGET CODE	AMOUNT	DISCOUNT	TOTAL
6	1235	18/07/2013	1	Buttons & Pins	440	£3,077.00	£92.31	£2,984.69
7	1237	27/11/2013	1	Buttons & Pins	440	£3,220.00	£96.60	£3,123.40
8	1240	04/12/2013	1	Buttons & Pins	440	£4,247.00	£212.35	£4,034.65
9	1247	12/08/2013	1	Buttons & Pins	440	£233.00	£0.00	£233.00
10	1253	26/01/2013	1	Buttons & Pins	440	£1,401.00	£14.01	£1,386.99
11	1331	29/05/2013	1	Buttons & Pins	440	£233.00	£0.00	£233.00
12	1337	17/06/2013	1	Buttons & Pins	440	£372.00	£14.01	£357.99
13				**440 Count**	7			
14	1262	09/09/2013	1	Buttons & Pins	441	£1,970.00	£19.70	£1,950.30
15				**441 Count**	1			
16	1263	11/02/2013	1	Buttons & Pins	442	£3,327.00	£99.81	£3,227.19
17				**442 Count**	1			
18	1264	12/10/2013	1	Buttons & Pins	444	£4,934.00	£246.70	£4,687.30
19				**444 Count**	1			
20	1265	13/03/2013	1	Buttons & Pins	446	£2,680.00	£40.20	£2,639.80
21	1266	14/04/2013	1	Buttons & Pins	446	£4,110.00	£205.50	£3,904.50
22	1267	19/04/2013	1	Buttons & Pins	446	£2,059.00	£30.89	£2,028.12
23				**446 Count**	3			
24				**Buttons & Pins Total**		£31,863.00		
25	1239	27/06/2013	2	Comp. Stores	440	£1,153.00	£11.53	£1,141.47
26	1254	26/01/2013	2	Comp. Stores	440	£348.00	£0.00	£348.00

Step 7

Save your file

Exercise 8 Hiding and showing subtotal detail

- *Use the Row level buttons - See Section 4.1.5*
- *Use the Show and Hide detail boxes - See Section 4.1.5*
- *Remove Subtotals - See Section 4.1.4*

Task 1

This task is to use the row level view and the show and hide buttons to view your data

Step 1

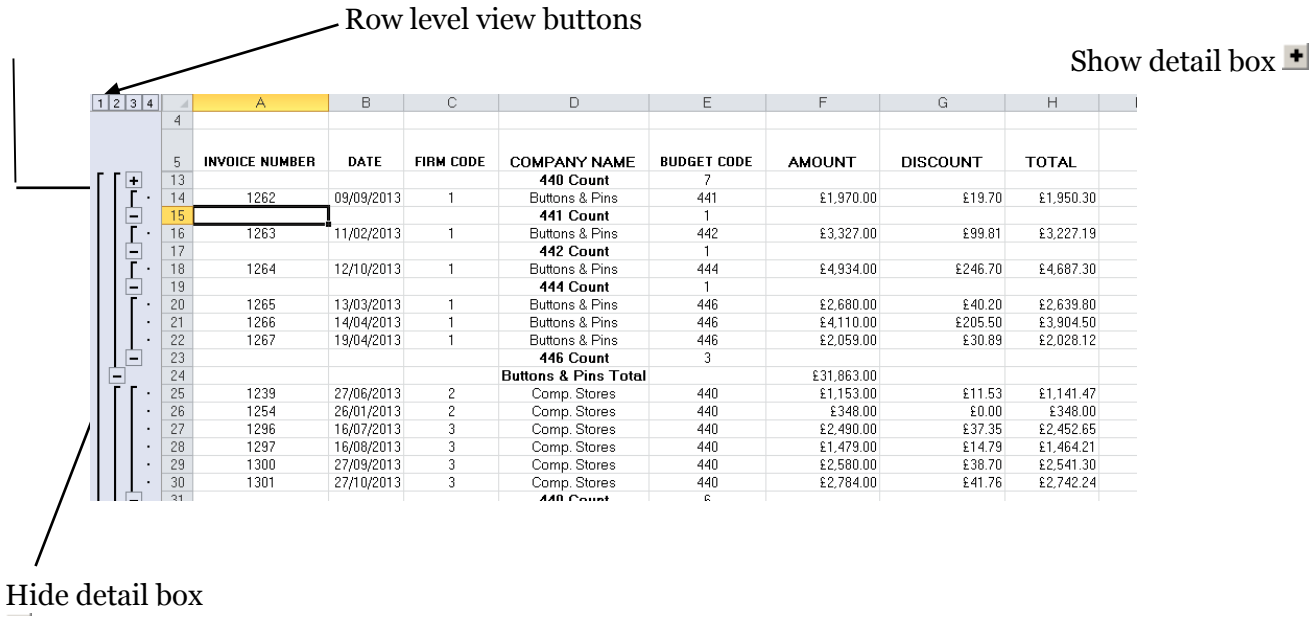
Work on the file you previously saved, having completed Exercise 7 (**`Data1.xlsx`**) or if you did not complete Exercise 7 open the file

`Data1 Ex7 Completed.xlsx`

Step 1

Using the row level view buttons view the different views of your subtotals.

Also with view 4 selected and all data visible use the show and hide buttons to view different sections of data differently.



	A	B	C	D	E	F	G	H
4								
5	INVOICE NUMBER	DATE	FIRM CODE	COMPANY NAME	BUDGET CODE	AMOUNT	DISCOUNT	TOTAL
13				440 Count	7			
14	1262	09/09/2013	1	Buttons & Pins	441	£1,970.00	£19.70	£1,950.30
15				441 Count	1			
16	1263	11/02/2013	1	Buttons & Pins	442	£3,327.00	£99.81	£3,227.19
17				442 Count	1			
18	1264	12/10/2013	1	Buttons & Pins	444	£4,934.00	£246.70	£4,687.30
19				444 Count	1			
20	1265	13/03/2013	1	Buttons & Pins	446	£2,680.00	£40.20	£2,639.80
21	1266	14/04/2013	1	Buttons & Pins	446	£4,110.00	£205.50	£3,904.50
22	1267	19/04/2013	1	Buttons & Pins	446	£2,059.00	£30.89	£2,028.12
23				446 Count	3			
24				Buttons & Pins Total		£31,863.00		
25	1239	27/06/2013	2	Comp. Stores	440	£1,153.00	£11.53	£1,141.47
26	1254	26/01/2013	2	Comp. Stores	440	£348.00	£0.00	£348.00
27	1296	16/07/2013	3	Comp. Stores	440	£2,490.00	£37.35	£2,452.65
28	1297	16/08/2013	3	Comp. Stores	440	£1,479.00	£14.79	£1,464.21
29	1300	27/09/2013	3	Comp. Stores	440	£2,580.00	£38.70	£2,541.30
30	1301	27/10/2013	3	Comp. Stores	440	£2,784.00	£41.76	£2,742.24

Step 2

Remove all subtotals before saving your file.

To remove subtotals choose **Data | Subtotal** from the **Outline** category and click on **Remove All** to remove your subtotals.

Save your file

Exercise 9 Consolidate data

- *Insert a table - See Section 2.2.3*
- *Create subtotals using Data Consolidation - See Section 4.2*

Task 1

This task is to create a summary of data for a total of the **Amount**, **Discount** and **Total** and also count the number of sales per **Company**

Step 2

Work on the file you previously saved, having completed Exercise 8 (**Data1.xlsx**) or if you did not complete Exercise 8 open the file

Data1 Ex8 Completed.xlsx

Step 1

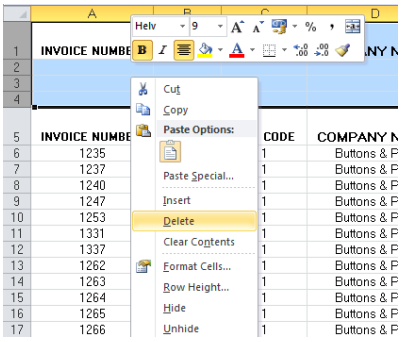
Ensure the subtotals have been removed from your data, if not please see, Exercise 8Task 1Step 2.

Task 2

Remove the criteria rows and convert your range to a table and name it **Sales2013**

Step 1

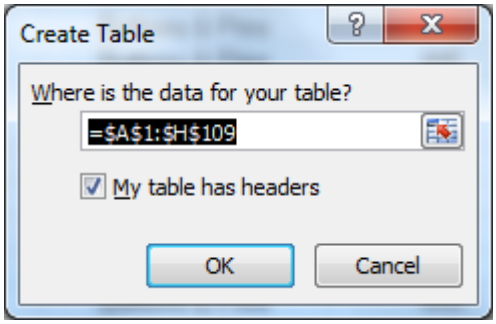
First remove the criteria range rows from your data. Select rows 1 to 4, right click and select **Delete**



Step 2

Click into your data and create a table named **Sales2013**

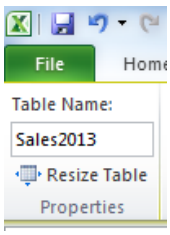
Click on **Insert | Table** the following range should be in the text box



Click on **OK**

Step 3

The **Table Tools | Design** ribbon will now be available. Select **Properties** and insert **Sales2013** for the name of the table



Task 2

Use Data Consolidation to summarise your data to display a total of **Amount**, **Discount** and **Total** and also count the number of sales per **Company**

Step 1

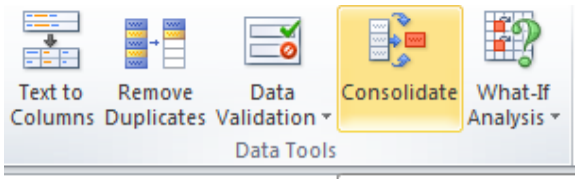
With Data Consolidation you do not need to pre-sort your data. To show the consolidation totals working, unsort your Company name field by sorting a different field.

Sort your data by **Invoice number**. Click into the **Invoice number** column and click on the **Data** |  button

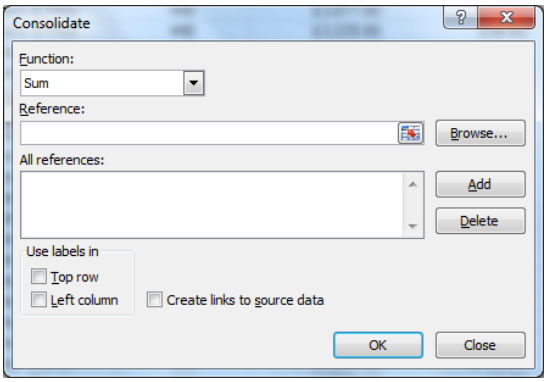
Step 2

Open a new worksheet and click into cell A1 where we would like the summary to appear.

Click on **Data | Data Tools | Consolidate**



The **Consolidate** dialog box will the display



Step 3

In the **Function** drop down list, the default is **Sum** and this is the function we need, leave this selected.

Step 4

Click into the **Reference** text box and select a range to consolidate. The left most column of data will be the field which you are summarising, so **Company Name** is required here and the right most column will be the final field which contains the data you would like to summarise, which will be **Total**

Step 5

Check the two check boxes **Top row** and **Left column** and click on **OK** Your data will summarise similar to the example below.

	A	B	C	D	E
1		BUDGET CODE	AMOUNT	DISCOUNT	TOTAL
2	Buttons & Pins	5745	£31,863.00	£1,072.08	£30,790.93
3	Plugs and Sockets	7082	£36,871.00	£1,017.48	£35,853.52
4	PerfectWord	4427	£27,892.00	£1,006.92	£26,885.09
5	Comp. Stores	4853	£27,121.00	£512.23	£26,608.77
6	Fixit Ltd	8859	£52,492.00	£1,626.93	£50,865.08
7	Sitting Pretty	7077	£41,014.00	£1,504.15	£39,509.86
8	Hardcopy stores	9720	£52,885.00	£1,649.22	£51,235.78
9					

Step 6

You will see that it has summarised all fields which were selected, one of which you is not required. Delete the Budget Code field which is not needed.

Select **Column B**, **right click** and select **Delete**

Step 7

Rename **Sheet2** as **Sales Summary 2013**

Point at the worksheet tab named **Sheet2** and double click. Insert a new worksheet named **Sales Summary 2013** and press <RETURN>

Rename **Sheet1** as **Master Lists**

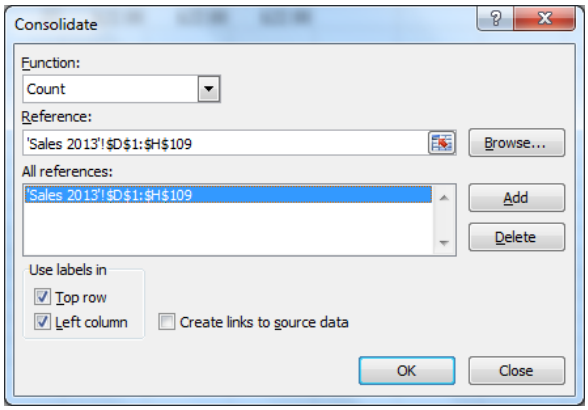
Task 3

Insert an additional total to count the number of sales per **Company**

Step 1

Select a cell next to your current summary on the newly named **Sales Summary 2013** worksheet, cell **E1**, and repeat the process, this time selecting **Count** from the **Function** menu.

This time you will not need to reselect the range for the **Reference** text box, you can click on the previously inserted reference located in the **All references** box



Once again a surplus number of columns, counting your data will appear. Delete columns E, G, H, & I which are not required.

Give the newly counted data in column E a new field name of **Number of Sales**

Your summary should look similar to below.

	A	B	C	D	E	F
1		AMOUNT	DISCOUNT	TOTAL	Number of sales	
2	Buttons & Pins	£31,863.00	£1,072.08	£30,790.93	13	
3	Comp. Stores	£15,214.00	£341.02	£14,872.98	6	
4	Fixit Ltd	£52,492.00	£1,626.93	£50,865.08	20	
5	Hardcopy stores	£101,663.00	£2,837.91	£98,825.09	43	
6	PerfectWord	£27,892.00	£1,006.92	£26,885.09	10	
7	Sitting Pretty	£41,014.00	£1,504.15	£39,509.86	16	
8						

Step 2

Save and close your file.

Exercise 10 Creating charts

- *Create a 2D column chart - See Section 5.2*
- *Create some other chart types - See Section 5.2*
- *Create a chart on a separate sheet - See Section 5.2*

Task 1

Open the file called **charts .xlsx**

This workbook contains test score figures for four different regions

Data for each region is on a separate worksheet

Task 2 Create a 2D column chart with the data for Scotland	**Step 1** Select the **Scotland** worksheet and select the data that is to be plotted (A3:E7) Include the column and row labels (row 3 and column A) in the selection, so these will appear on the chart
	Step 2 On the **Insert** tab, choose **Column** from the **Charts** group Choose the first type which is the **2-D Column**
	Step 3 A new chart is inserted on this worksheet, floating over the cells
	Step 4 If the position of the chart is not convenient, drag the thick border of the chart to move it to a better position
Task 3 Create embedded charts for the other regional sheets	**Step 1** Create a 3D column chart for England, embedded on the **England** sheet
	Step 2 Repeat for **Wales** and **N_Ireland** Experiment with other chart types if you like
Task 4 Create a chart for the Summary data, on a separate chart sheet	**Step 1** Switch to the **Summary** sheet Select the data cells, including the labels: A3:E7
	Step 2 Press the key F11
	Step 3 A new chart, with all the default settings, is created on a separate sheet
	Step 4 Rename the chart sheet **Summary Chart**

Exercise 11 Rearranging the chart

- *Move the chart location - See Section 5.5*
- *Experiment with viewing data as different types of chart - See Section 5.5*
- *Switch data between rows and columns - See Section 5.5*
- *Change the colour scheme - See Section 5.5*

Task 1
Continue work in **charts.xlsx**

Task 2 Move the chart between worksheets	**Step 1** Select the embedded chart on the **Scotland** worksheet: you may need to click on it to activate it (thick border appears around the chart)
	Step 2 Click  (probably found at the right-hand end of the **Chart Design** tab of the ribbon)
	Step 3 Select **As new sheet:** and use the name **Scotland_Chart**
Task 3 Experiment with viewing data as different types of chart Finish with a 2D column chart	**Step 1** Make sure the sheet **Scotland_Chart** is active
	Step 2 Click on the **Design** tab of the ribbon
	Step 3 Click on the **Change Chart Type** button  to change the chart type
	Step 4 Try out some different chart types (e.g. bar, 3D column)
	Step 5 When finished, please change back to a 2D column chart
Task 4 Switch the data series between rows and columns	**Step 1** You can switch the chart so that the Weeks 1 to 4 are shown along the horizontal axis, and the months are the column colours using 
	Step 2 Switch again, finishing with an arrangement that you feel makes sense of the data
Task 5 Try some different colour schemes	**Step 1** With the same chart active, choose a different colour scheme from the **Chart Styles** on the **Design Chart** tab of the ribbon

	Step 2 For each colour scheme, there are several style variations available if you click
	Step 3 Bear in mind that if you will be printing using black ink only, a black & grey colour scheme will probably give best results

Exercise 12 Selecting and resizing chart objects

- *The parts of a chart - See Section 6.1*
- *Select parts of the chart using the mouse and the ribbon - See Section 6.1*
- *Select a data series or point - See Section 6.1*
- *Move, resize or delete a chart object - See Section 6.1*

Task 1 Continue work in **charts .xlsx** or open **charts partial1.xlsx**	
Task 2 Practice using the mouse to select parts of the chart	**Step 1** Click on the **Scotland** chart
	Step 2 Practice using the mouse to select parts of the chart: axes, gridlines, or titles
	Step 3 Pause the mouse over a part, to see its name as a ScreenTip
	Step 4 Click once to select a data series – notice the coloured handles that appear on some or all of the data points in the series
	Step 5 Click a second time on one data point – notice the coloured handles that appear on just that data point
Task 3 Select parts of the chart using the drop-down control	**Step 1** Notice that the object currently selected is indicated in the control at the left of the **Chart Layout** tab and the **Chart Format** tab 
	Step 2 Practice selecting parts of the chart using this control
Task 4 Right-click parts of the chart to see commands available	**Step 1** Right-click on the Plot Area Notice the commands available on the context menu
	Step 2 Right-click on some other parts of the chart, and notice the different commands that are offered

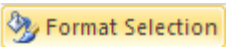
Task 5 Practice resizing chart objects	**Step 1** Use any of the above methods to select the **Legend**
	Step 2 Position the mouse pointer over any one of the object handles The pointer shape changes to a two-way arrow
	Step 3 Click and drag with the mouse to stretch the legend
Task 6 Practice moving chart objects	**Step 1** Select the legend and then position the mouse pointer over its border (not a handle) The pointer must be a four-way arrow to move the object
	Step 2 Click and drag the legend to a new position, such as the top centre of the chart
Task 7 Delete an object	**Step 1** Delete the chart title and the horizontal axis title, if they exist

Exercise 13 Formatting the chart

- *Format your chart to suit your requirements - See Section 7.1*
- *Borders and shading - See Section 7.1*
- *Font formatting - See Section 7.1*
- *Shape and style - See Section 7.1*

Task 1
Continue work in **charts.xlsx** or open **charts partial1.xlsx**, on the **Scotland** sheet

Task 2 Give the chart area a coloured shading and a border	**Step 1** Move the mouse around the chart until the ScreenTip says **Chart Area**
	Step 2 Click once to select the chart area Click Format Selection on the **Chart Layout** or **Chart Format** tab of the ribbon
	Step 3 From the panel on the left of the dialog, choose **Border Color** Change the colour to a **Solid line (red)**
	Step 4 Choose the **Fill** category Set a pale coloured solid fill

	Step 5 Investigate the other categories from the left panel Click **Close**
Task 3 Change the font settings (typeface, font size and colours) of the whole chart	**Step 1** Click once in the Chart Area
	Step 2 Notice that you can also change the font type, size, etc. from the familiar formatting buttons on the **Home** tab Make a few improvements
Task 4 Reformat the legend to make it clear and interesting	**Step 1** If necessary, show a legend using  on the **Chart Layout** tab Select the **legend**
	Step 2 Click  on the **Chart Format** tab of the ribbon
	Step 3 Using the **Legend Options** tab, change the **Legend Position** to **Top** Choose **Close** when finished This is an alternative to dragging the legend
Task 5 Apply a different shape style to one of the series of data columns or to one individual data point	**Step 1** Click *once* on one of the data series (i.e. one of the columns in your chart) Notice that the object handles indicate the series you are working with
	Step 2 Choose one of the Shape Styles from the **Format** tab
	Step 3 Click again on one data point (ie. one column of the series) Notice that the object handles now indicate just this single data point
	Step 4 Apply a contrasting Shape Style to this data bar Choose **Close** when finished

Exercise 14 Making a chart more readable

- *Control the way the vertical axis displays - See Section 8.1*
- *Give a title to the whole chart - See Section 8.1*
- *Label the axes - See Section 8.1*

Task 1

Continue work in **charts.xlsx** or open **charts partial2.xlsx**, on the **Scotland** chart sheet

Task 2 Change the formats and appearance of the vertical axis	**Step 1** Move the mouse pointer carefully until the screentip says **Vertical (Value) Axis** Note it may be easier to point to an axis number than the vertical line which is rather thin Right-click on the **Value Axis** (Y or vertical) and choose **Format Axis**
	Step 2 If this is difficult, use the drop-down control at the left end of the **Chart Layout** tab, and choose **Vertical (Value) Axis** then click Format Selection
	Step 3 Choose the **Number** category in the left panel Specify **Number** formatting with 0 decimal places
Task 3 Change the vertical axis to plot between 0 and 500	**Step 1** Still in the **Format Axis** dialog, display the **Axis Options** category
	Step 2 Change the **Maximum** to **Fixed** and 500
	Step 3 Investigate the other categories from the left panel Choose **Close** when finished, and examine the effects on your chart
Task 4 Insert a chart title	**Step 1** Select the **England** sheet, which has a chart embedded on it Make the chart active (click once to see the thick border)
	Step 2 Choose **Layout** tab of the ribbon, and from the **Chart Title** choose **Above Chart** A new textbox appears above the plot area

	Step 3 Edit the text in the Chart title textbox to **England results**
	Step 4 You can adjust the formatting of the chart title using the **Home** tab formatting buttons
	Step 5 You can also move the textbox anywhere on the chart
Task 5 Insert titles for the horizontal and vertical axes	**Step 1** On the **Chart Layout** tab, click 
	Step 2 Now choose **Primary Horizontal Axis Title| Title Below Axis**
	Step 3 Change the text to **`Months tested`** When you have finished typing in the text box, do not press ENTER (that would give you a new line), so press ESC or click on some other part of the chart
	Step 4 Repeat to insert **`exam scores`** as a rotated title beside the vertical axis
Task 6 Edit the text of a title	**Step 1** Select the title that you wish to edit by clicking on it once Blue object handles around the title indicate that it has been selected
	Step 2 Position the pointer over the text of the selected title You should notice that the pointer changes to an I-beam Click in the title
	Step 3 A cursor (like that used in word-processing) appears within the text Edit the text by deleting or inserting characters as you would with a word-processor
	Step 4 When you have finished, click away from the object This de-selects the edited title, leaving the changes intact

Exercise 15 More chart options

- *Set up data labels on a whole chart - See Section 8.1*
- *Show data labels on one series - See Section 8.1*
- *Show data labels on one data point - See Section 8.1*
- *Explore some of the options available from the Layout tab - See Section 8.1*
- *Legend - See Section 8.1*
- *Gridlines - See Section 8.1*
- *Data table - See Section 8.1*

Task 1
Continue work in **charts.xlsx** or open **charts partial3.xlsx**, on the **Scotland** chart sheet

Task 2 Set up data labels on all series in a chart	**Step 1** Choose **Layout Chart Tools** tab of the ribbon and choose 
	Step 2 With no data series selected, select one of the Data labels positions (**Center, Inside End, Inside Base, Outside End**)
	Step 3 Alternatively, click on **More Data Label Options** to further change the labels
Task 3 Delete the data labels	**Step 1** To remove the data labels, repeat the above step but now choose **None** from **Data Labels** You can also remove one by clicking on it and pressing DELETE
Task 4 Set up different kinds of labels on each series in a chart	**Step 1** This time, select just one data series Object handles will appear indicating that the whole data series has been selected Use  to add labels to this series – choose to position the value labels at the centre
	Step 2 Select a different data series and click  , then choose a different label position
	Step 3 To change the formatting of existing data labels, use the same button
Task 5 Add a data label on one point only	**Step 1** Select the data series, then single-click on one data point (choose one whose value looks particularly high or low)

	Step 2 The object handles should show on only one data point
	Step 3 Use  to add a label to this point (This feature is only available for some chart types such as column charts)
Task 6 Explore some of the options available from the **Layout** tab	**Step 1** Choose the **Layout** tab of the ribbon
	Step 2 Explore the effect of gridlines and their options using 
	Step 3 Think about whether horizontal or vertical gridlines (or both) would make your chart easier to understand
Task 7 Add a legend	**Step 1** On the **Layout** tab of the ribbon, click 
	Step 2 Try some of the options for the position of the legend
	Step 3 Finish with it **Shown at the Right**
Task 8 Add a data table below the chart	**Step 1** On the **Layout** tab of the ribbon, click 
	Step 2 Insert a data table below the chart
	Step 3 Try the options: do you think that showing the legend key helps, or not?
Task 9 Review the finished chart: Is it easy for your readers to understand what the data is saying? Is the information clear or cluttered? Make some final changes as needed	
Task 10 Close the **charts** workbook, saving if you wish	

Exercise 16 Plotting non-adjacent ranges

- *Create a chart using two non-adjacent data ranges - See Section 8.1*
- *Plot the average data contained in the England worksheet - See Section 8.1*
- *Label the chart - See Section 7.1*
- *Use formats to make the chart simple to understand - See Section 7.1*

Your task is to plot the average test scores for England, without the separate month data. This means that you have to plot data drawn from two separate worksheets into the same chart.

Task 1

Open the workbook **regional scores .xlsx**

Task 2

Create a chart showing the scores in England for each of the location points 1 to 4, averaged across the months

Step 1

Select the range **A3:A7** in the **England** worksheet

Hold the CTRL key and select the range **G3:G7**

Step 2

Choose **Insert** tab of the ribbon and choose **Column** chart (**2D Column**)

An embedded column chart will be inserted on the sheet, showing only the average series of data

Task 3

Confirm the data source/s used in the chart

Step 1

To check the range, click 

on the **Design** tab

Step 2

The **Select Data Source** dialog will appear

Make sure that the Chart data range is
=**England!$A$3:$A$7, England!$G$3:$G$7**

Step 3

Cancel the dialog without making changes

Task 4

Format parts of the chart and add labels, to make it easy to understand

Step 1

Change the chart options and label the chart.

The chart title is **Average Test Scores**

Step 2

The horizontal axis title is **Location**

The vertical axis title is **Scores**

Step 3

Although the legend is not needed yet, leave it in place as it will be useful when more data series are added

Task 5

Move the chart to a separate chart sheet and name it **BritishScores**

Exercise 17 Adding more non-adjacent ranges

- *Add data from the Scotland and Wales worksheets using the Select Data dialog- See Section 8.2*
- *Add data from the N_Ireland worksheet using Copy & Paste - See Section 8.2*
- *Update the legend - See Section 8.2*

Your task is to plot the average test scores for England, Scotland, N Ireland and Wales. This means that you have to plot data drawn from three separate worksheets into the same chart.

You will now add in the data from the other regions.

Task 1

Continue work in **regional scores .xlsx**

Task 2

Add the corresponding data from the **Scotland** worksheet to the **BritishScores** chart

Step 1

With **BritishScores** active, click  on the **Design** tab

Step 2

Click  to add another data series

Step 3

Collapse the **Series name** box using 

Click on the **Scotland** worksheet tab and then click on cell A1

Un-collapse the box

Step 4

Delete whatever is given in the **Series values** box then click the collapse dialog button 

Then click the **Scotland** worksheet tab and choose the range G4:G7

Un-collapse the box

Step 5

Return to the Data Source dialog and click **OK**

Confirm that the Scotland average data has been added to the chart

Task 3

Repeat the above steps to add in the average figures from the **Wales** sheet

Task 4 Use the Copy and Paste method to add in the average figures from the **N_Ireland** sheet	**Step 1** In the **N_Ireland** worksheet, select G3:G7
	Step 2 **Copy**
	Step 3 In the new **BritishScores** chart, **Paste**
	Step 4 The N Ireland data now appears as a 4th series in the summary chart
Task 5 Correct the legend text	**Step 1** Notice that some of the entries in the legend are wrong – for each series the series name should be taken from cell A1 of the worksheet, because that is where the country names are entered
	Step 2 Choose **Select Data** 
	Step 3 In the **Select Data Source** dialog, choose the data series currently called **Average** (which was taken from the England worksheet) Click the **Edit** button
	Step 4 In the **Series name**: text field change the entry to **=England!$A$1** Repeat for any other legend entries that are wrong
	Step 5 Click **OK** to close the **Select Data Source** dialog

Task 6

The column chart should now show data from Scotland, England, Wales, and Northern Ireland, similar to Figure 1.

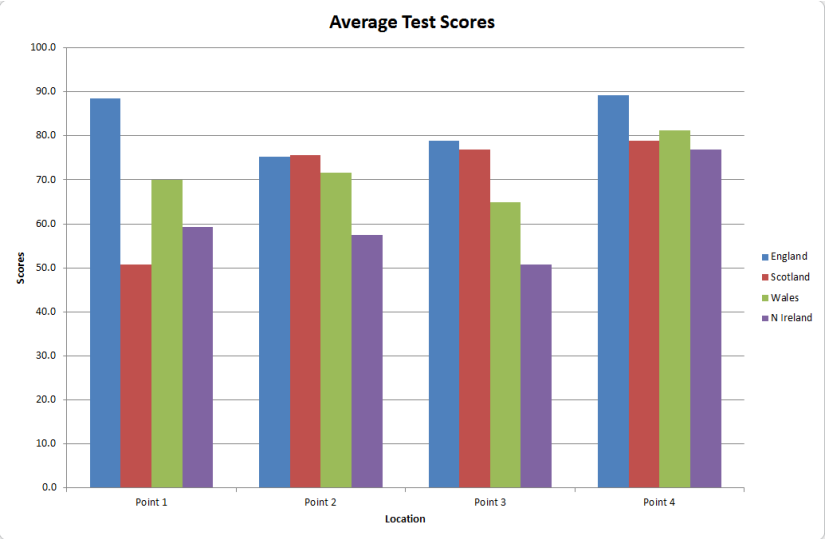


Figure 1 Average Test Scores Column Chart

Exercise 18 A chart with mixed types

- *Plot all the test score figures for Wales in one combination chart - See Section 8.6*
- *Include the average data - See Section 8.6*
- *Show the average data as an area behind the monthly columns - See Section 8.6*
- *Label and format the chart - See Section 8.6*

Figure 2 is a combination chart, where the monthly scores for the four location points are shown as ordinary columns, however the average is shown as the shaded area behind.

You will create a similar chart.

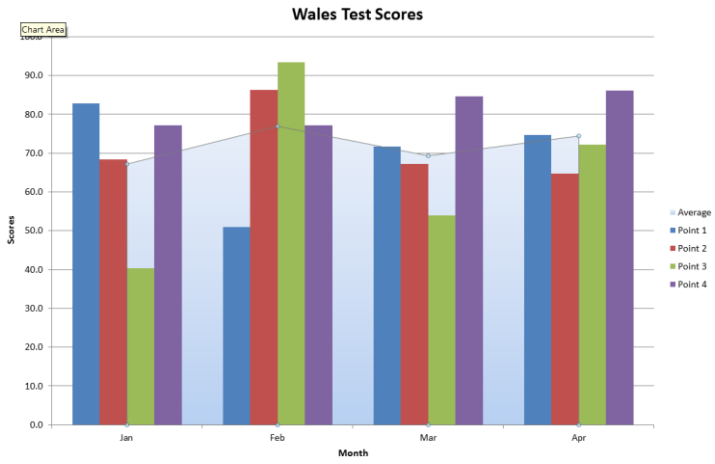


Figure 2 A combination chart

Task 1

Continue work in **regional scores .xlsx** or open **regional scores partial1.xlsx** on the **Wales** worksheet

Task 2

Create a new chart with the scores by month and by point for Wales, including the average figure for each month

Step 1

Create a new 3D column chart for the range A3:E7

Step 2

Ensure that the months are shown along the horizontal axis (you might need to switch the rows and columns by selecting the chart and clicking **Switch Row/Column** on the **Design** tab)

Step 3

Use the Copy/Paste method to add another data series showing the average figure for each month (row A9:E9 on the worksheet)

Step 4

Check that there is a legend listing the 4 Points and the Average

Step 5

The Chart Title is **`Wales Test Scores`**

Step 6

The horizontal axis title is **`Month`**

	Step 7 The vertical axis title is **Scores**
	Step 8 Move the chart as a new sheet and call it **Wales_Results_Chart**
	Step 9 You should now have a chart which illustrates the data from January to April, at Points 1 to 4 plus the Average test score totals
Task 3 The objective now is to differentiate the Average figures from the Point 1 to 4 figures so that it can be seen more clearly.	
Task 4 Make the Average data stand out by having a different chart type – an area chart	**Step 1** Select the **Average** data series (check that there are several blue handles on columns of this series)
	Step 2 Choose  Select a simple **Area** from the **Chart Type** list
	Step 3 Use the buttons on the **Chart Format** tab to improve the shading colours and fills if you like

Exercise 19 A combination chart with a secondary axis

- *Add a data series with the Total data - See Section 8.7*
- *Present the Total data against a secondary axis - See Section 8.7*
- *Set a more suitable axis scale for the secondary axis - See Section 8.7*
- *Label and format the chart, making the secondary axis distinct - See Section 8.7*

Figure 3 is a combination chart, where the monthly scores for the four location points are shown as ordinary columns, however the average is shown as the shaded area behind.

The total scores, whose values are of course much higher than the individual points, are plotted against a secondary axis on the right, and the data series is shown as a line chart to distinguish it from the columns.

You will create a similar chart.

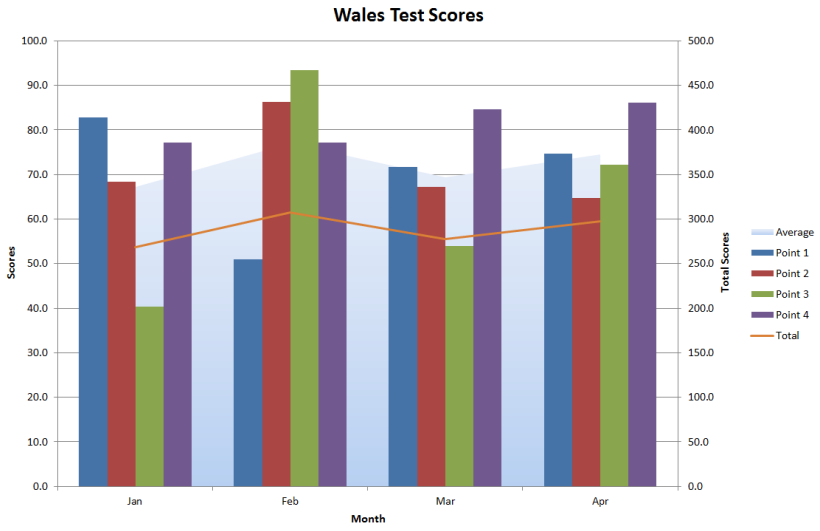


Figure 3 A combination chart

Task 1

Continue work in **regional scores .xlsx** or open **regional scores partial1.xlsx** on the **Wales** worksheet and the **Wales_Results_Chart**

Task 2

Add a series with the total figures from **Wales** (cells B8:E8) to the chart

Step 1

In the **Wales** worksheet, select cells B8:E8

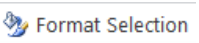
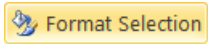
Step 2

Copy

Step 3

In the **Wales_Results_Chart**, **Paste**

The Total data should appear as another data series, initially as tall columns

	Step 4 Notice that the vertical axis automatically re-scales, so as to display the Total data which of course has bigger values than the separate points The monthly columns are temporarily rather small, but that will improve shortly
Task 3 Correct the legend text	**Step 1** See Exercise 17 above for the steps to correct the text in the legend from "Series 6" to "Total"
Task 4 Display the Total series as a line on the chart, to distinguish it from the monthly columns	**Step 1** Select the **Total** data series in the chart
	Step 2 Click  on the Chart Design tab of the ribbon
	Step 3 Choose a simple line chart type Now the Total data is noticeably different from the Point data
Task 5 Plot the **Total** data series against a secondary vertical axis	**Step 1** Select the **Total** data series in the chart Click 
	Step 2 On the **Series Options** category, choose to Plot series on a **Secondary Axis**
	Step 3 While you are here, have a look at what some of the other tabs allow you to do, but do not change anything. When you have finished exploring, choose **Close**
	Step 4 Notice that the axis for the Total data is marked on the right-hand side of the chart, and the values are quite different from those on the primary axis The maximum and minimum values have been set automatically (we will fix this shortly)
Task 6 Set a suitable axis scale for the Total data	**Step 1** Select the Secondary Value Axis on the right-hand side of the chart – if it is too difficult to click the axis, use the Chart Elements drop-down list at the left end of the **Chart Layout** or **Chart Format** tab of the ribbon
	Step 2 Click  on the **Chart Layout** tab of the Ribbon

	Step 3 In the **Axis Options** tab, set a fixed **Minimum** of **0** and a fixed **Maximum** of **500**
Task 7 Add a title for the secondary Vertical Axis	**Step 1** On the **Chart Layout** tab of the ribbon, click 
	Step 2 Choose **Secondary Vertical Axis Title**, and **Rotated Title**
	Step 3 Click in the Axis Title box, and type **Total Scores**
Task 8 Format and label other elements of the chart, to make it clear and easy to understand Close the workbook, saving if you wish	

Exercise 20 Create a line chart • *Create a Line chart showing the courses that a group of students attended in 2003 and 2004 - See Section 9.1*	
Task 1 Open **class attendance .xlsx** at the **Classes 2003-4** worksheet This shows the numbers of times certain courses were run	
Task 2 Create a line chart showing the number of times courses were run over the years 2003 and 2004	**Step 1** Select cells A3:C30
	Step 2 Create a line chart with markers
	Step 3 Work on the chart so it looks similar to Figure 4 below
Task 3 The chart shows two data series, for years 2003 and 2004 The categories (course titles) are listed on the horizontal axis The values (numbers of students attending) are plotted against the vertical axis	
Task 4 Move the chart to a separate chart sheet, calling it **Attendance_Line**	
Task 5 Leave the class attendance workbook open, for a later exercise	

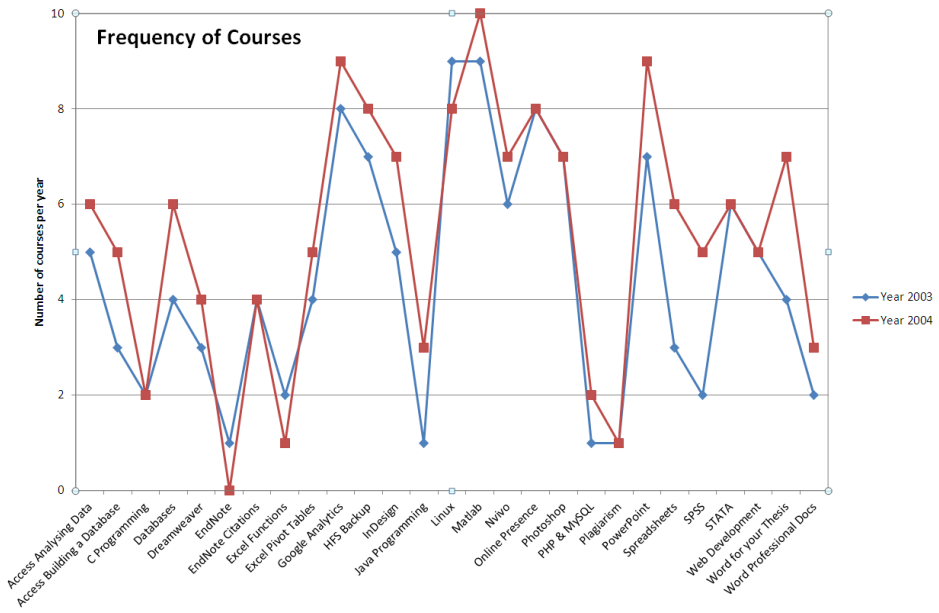


Figure 4 Frequency of courses

Exercise 21 Create a basic scatter chart

- *Create a scatter chart based on pairs of numbers - See Section 9.2*
- *Choose data point markers - See Section 9.2*
- *Improve the labelling and formatting - See Section 9.2*

Task 1

This task is to create a scatter chart to show the relationship between current and voltage measured in an electrical circuit

Open **Ohms Law experiment.xlsx**

Task 2 Create an XY scatter chart of the experimental data	**Step 1** Select cell D3:E9 on the **Ohm's Law** worksheet
	Step 2 Create an XY (Scatter) chart
	Step 3 Use the Chart sub-type **Scatter with Straight lines and Markers**
Task 3 Improve the labelling and formatting	**Step 1** Use Add Chart Element  to add titles for the axes: voltage / V (horizontal) current / A (vertical)

	Step 2 Remove the legend which is not needed
	Step 3 Change the range over which each axis is plotted, if you wish
	Step 4 Format the vertical axis to show figures to 1 decimal place

Task 4

The completed chart should look similar to this:

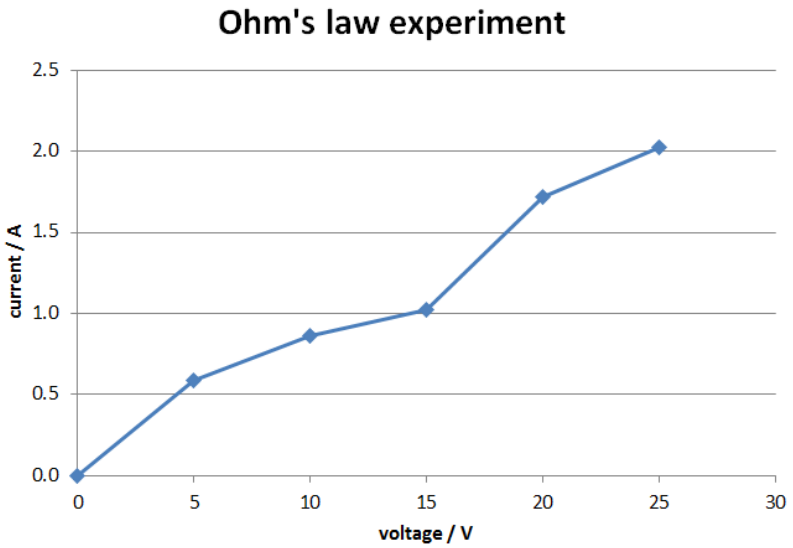


Figure 5

Task 5

Use the chart to think about the data: if one of the points seems out of line with the rest, perhaps it is an outlier?

You might go back to the experiment to investigate the details of that measurement, whether it was done in a different way or needs a repeat test

Task 6

Close the workbook, saving changes if you wish

Exercise 22 Create another scatter chart

- *Create a scatter chart - See Section 9.2*
- *Use the same data from the earlier (Line Chart) exercise - See Section 9.2*
- *This time, plot the data in pairs on two numerical axes - See Section 9.2*

Task 1

Continue work in **class attendance .xlsx** or open **class attendance partial1.xlsx** at the **Classes 2003-4** worksheet

Inspect the data: for each course title named in column A, columns B and C show the number of times the course ran in 2003 and 2004

Task 2 Create an XY Scatter chart using the Year 2003 and year 2004 courses data Your chart should have two value axes, showing Year 2003 data along the X-axis and Year 2004 along the Y-axis	**Step 1** Select cells B4:C30
	Step 2 Create an XY Scatter chart using the chart sub-type **Scatter With Only Markers**
	Step 3 Note that a scatter chart has two value axes: one set of numerical data is plotted along the X-axis and another set of numerical data is plotted along the Y-axis
	Step 4 Hover the mouse pointer over a data point and identify which data row in the worksheet (columns B and C) it represents
Task 3 Annotate and format the chart to match the example below	**Step 1** Add the necessary titles for X-axis, Y-axis and the chart
	Step 2 Delete the legend
	Step 3 Format both axes to have a fixed scale from 0 to 10
	Step 4 Set the major unit of the vertical axis to 2
	Step 5 Give the chart a title

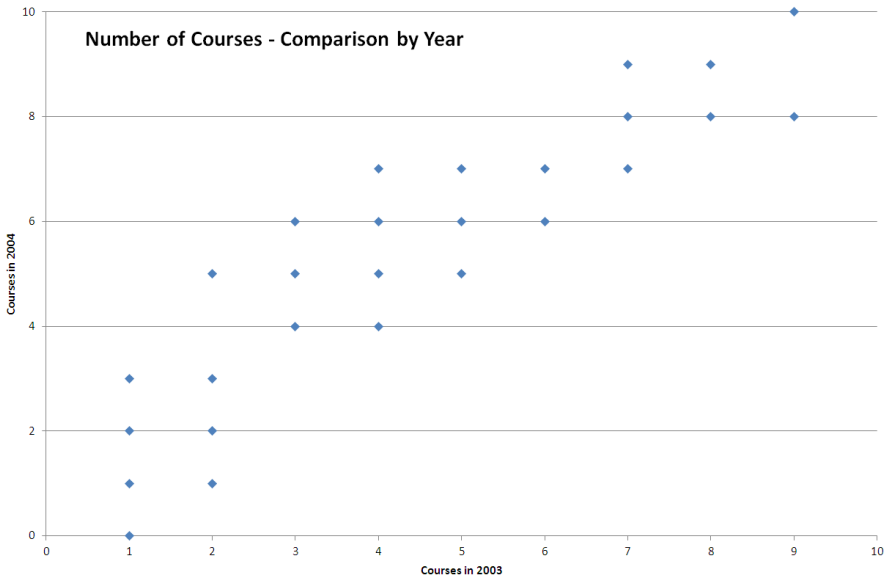


Figure 6

Task 4

Save the chart as a new sheet, and name it **Attendance_Scatter**

Exercise 23 Improve the scatter chart with a line (*Optional*)

- *Add a diagonal line to help understand the data meaning - See Section 9.2*

Task 1

Continue work in **class attendance .xlsx** or open **class attendance partial1.xlsx** at the **Classes 2003-4** worksheet

Continue work to improve the **Attendance_Scatter** chart

Data values are provided in columns E and F, for the bottom left and top right corner of the chart

Task 2

Add a diagonal line from (0,0) to (10,10)

Hint: use **Paste Special** to paste the data onto the chart as an additional data series

Step 1

On the sheet **Classes 2003-4**, select the range **E4:F5**

Copy

Step 2

Don't simply paste!

Click once on the **Plot Area** of the scatter chart

Click the down arrow on the **Paste** button  (on the **Home** tab)

Choose **Paste Special** from the menu

Step 3

Complete the **Paste Special** dialog box as shown below

Red markers appear on the chart at (0,0) and (10,10)

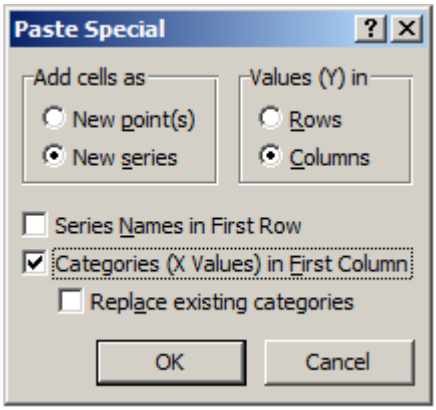


Figure 7

Task 3 Change the chart sub-type for the new data series to be a line	**Step 1** Carefully select the new data series
	Step 2 Select 
	Step 3 Change the Chart sub-type to **Scatter with Straight lines**

Figure 8

Task 4

Look at the chart you have made

Most of the points lie on or above the y=x line – what does that tell you about course numbers in 2004 compared with 2003?

[In the second year, most of the courses were run the same number of times or more often, compared with the earlier year]

Task 5

Close the workbook, saving if you wish

Exercise 24 Creating a histogram

- *Create a histogram showing IQ distribution - See Section 10.3*
- *Create histograms to show all four types of distribution - See Section 10.3*

Task 1

In this task you will create a histogram from 1000 records showing people's IQ test results

Step 1

Open the **IQ** worksheet in **Histograms.xlsx**

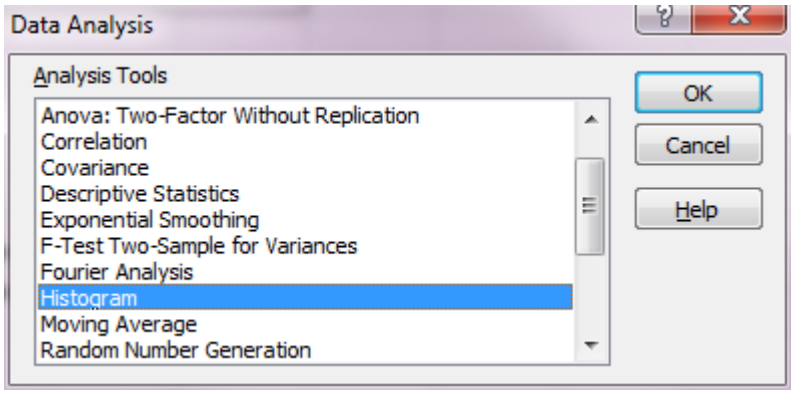
Cells **A7 to A13** show the boundaries of the **IQ** ranges (called **bin ranges**).

E8 to E1008 contain the **IQ** results, which in the Histogram is the **Input Range**.

Select the **Data** tab on the Ribbon and select **Analysis**

Then select **Histogram**, from the Data Analysis dialog box.

Click **OK**



Step 2

Complete the fields in the **Histogram** window.

For **Input Range:** enter the location of the results: **$E$8:$E$1008.**

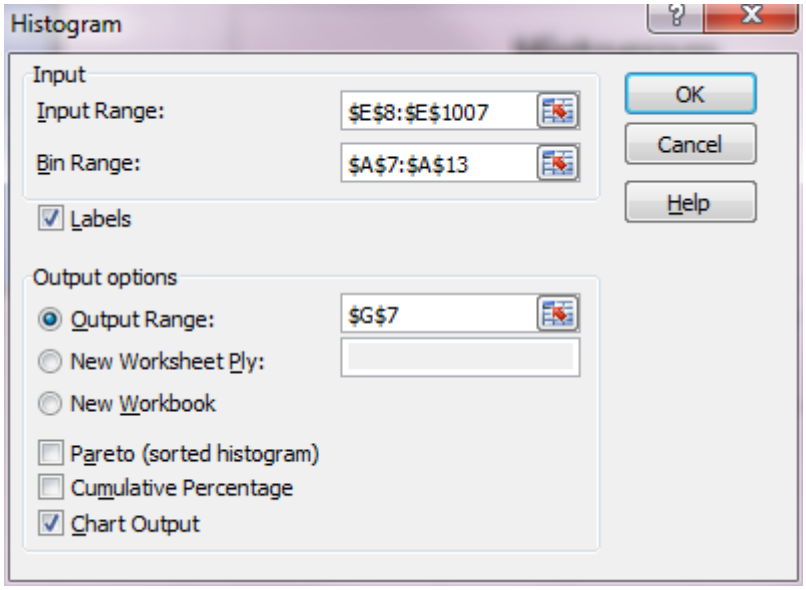
For the **Bin Range:** enter **$A$7:$A$13.**

Tick the **Labels** box.

For the **Output Range** click into cell: $G$7

Tick **Chart Output**

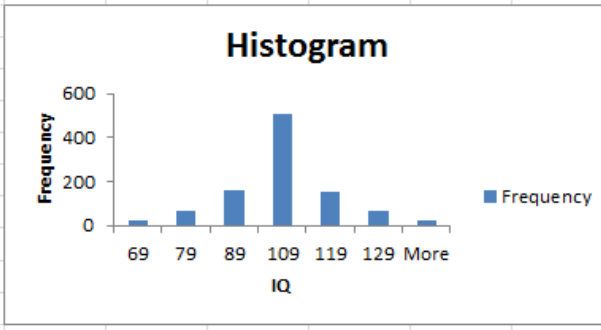
Click **OK**



A table showing the frequency distribution of the input range and the histogram will be added to the worksheet see below

You now need to format the chart.

IQ	Frequency
69	22
79	67
89	159
109	505
119	157
129	64
More	25



Step 3

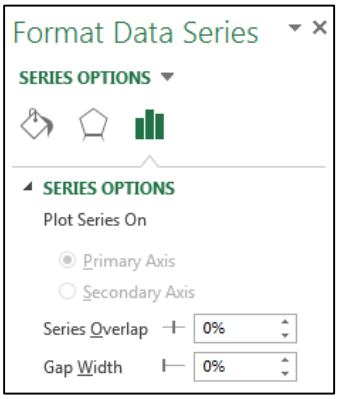
Format the histogram.

Firstly increase the width of the columns in the chart.

Right-click the data series then select **Format Data Series...**

In the **Format Data Series** dialog box and in **Series Options** section set the **Gap Width** to `0%`.

Click **Close**

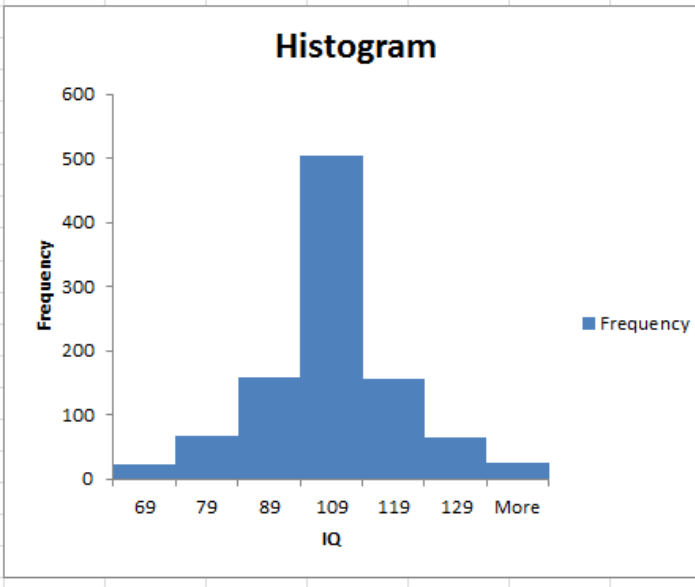


The completed histogram should look the same as below.

You can see quite clearly 505 people falling into the 90-109 range with a symmetric distribution of data.

Save your work and keep the file open.

IQ	Frequency
69	22
79	67
89	159
109	505
119	157
129	64
More	25



Task 2

This task is to create additional histograms showing the common ways histograms can be defined with differing distribution of data.

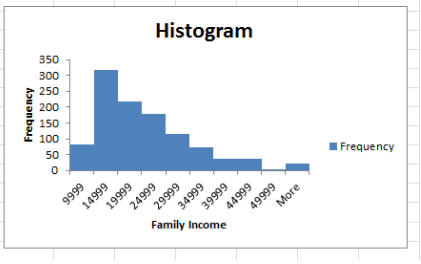
Step 1

Create histograms in the same way as **Task 1** using data from the following worksheets:

Family Income

The histogram should look like below

Family Income	Frequency
9999	81
14999	317
19999	218
24999	179
29999	115
34999	72
39999	37
44999	38
49999	5
More	21

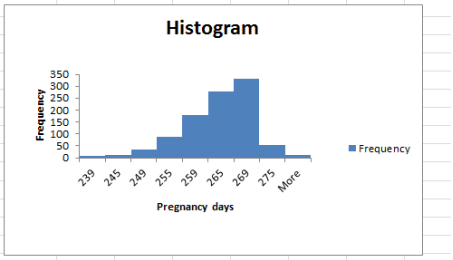


Step 2

Days from conception

The histogram should look like below

Pregnancy days	Frequency
239	9
245	13
249	34
255	87
259	177
265	278
269	330
275	54
More	12

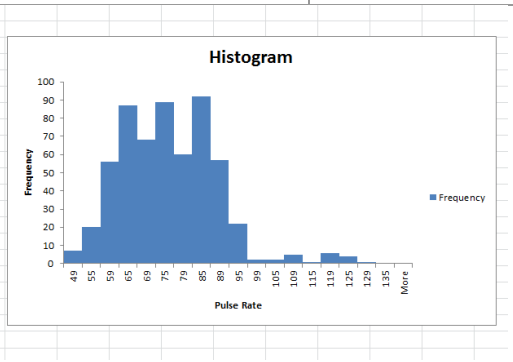


Step 3

Pulse Rates

The histogram should look like below

Pulse Rate	Frequency
49	7
55	20
59	56
65	87
69	68
75	89
79	60
85	92
89	57
95	22
99	2
105	2
109	5
115	1
119	6
125	4
129	1
135	0
More	0



Save and close your file

Exercise 25 Create Office 2013 Sparklines

- *Use Sparklines to spot trends in Crystal Ball shares data - See Section 11.1*
- *Customise the Sparkline - See Section 11.1*
- *Explore the effect of hiding part of the data, on a Sparkline - See Section 11.1*

Task 1

Create Sparkline charts to show how Crystal Ball investment trusts have performed since 2006

Step 1

Open **Crystal Ball Shares.xlsx**

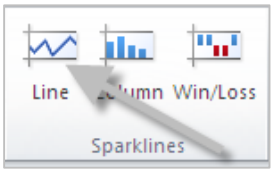
The data you will be using is in the **Shares** worksheet

This workbook contains data showing the performance (share price) fluctuations for four investment trusts over a six year period

Step 2

Select cells **T4:T7**, the cells where the Sparklines will appear

Select **Insert | Sparklines** and choose the **Line** button.



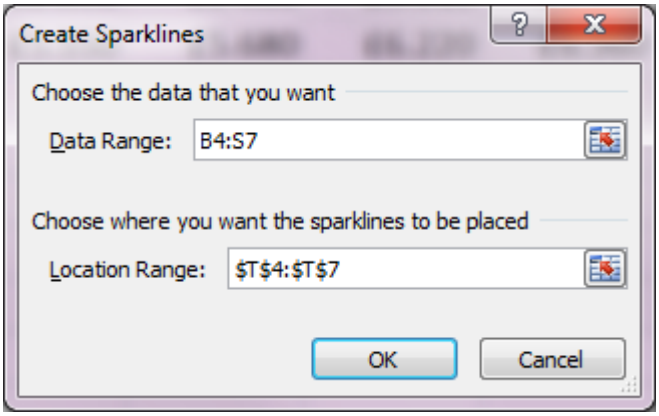
Step 3

In the **Create Sparklines** dialog, complete the boxes:

Data Range are the cells whose values you want to appear in the chart

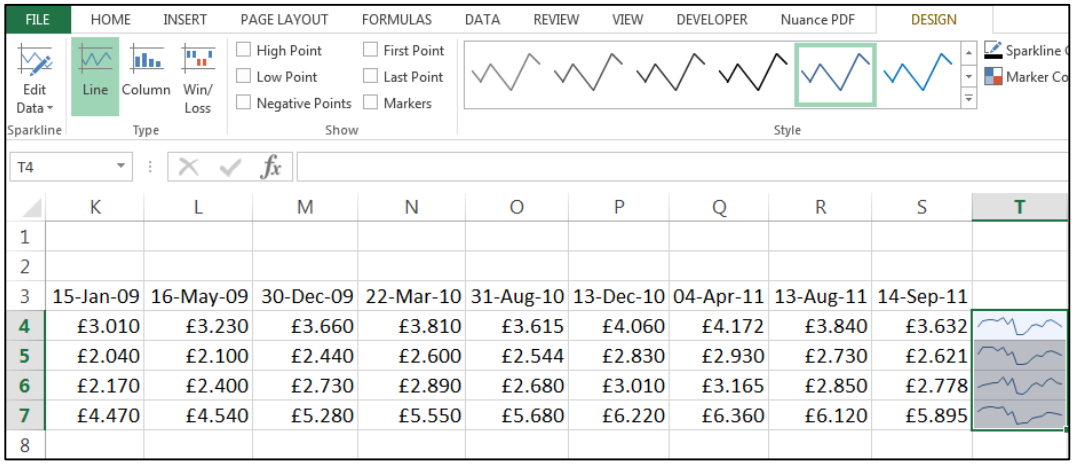
Location Range is the cell where you want the chart to appear in the worksheet

Click on **OK**



Task 2

The **Sparkline Tools** tab will now appear automatically on the Ribbon when a Sparkline is selected.



	K	L	M	N	O	P	Q	R	S	T
1										
2										
3	15-Jan-09	16-May-09	30-Dec-09	22-Mar-10	31-Aug-10	13-Dec-10	04-Apr-11	13-Aug-11	14-Sep-11	
4	£3.010	£3.230	£3.660	£3.810	£3.615	£4.060	£4.172	£3.840	£3.632	
5	£2.040	£2.100	£2.440	£2.600	£2.544	£2.830	£2.930	£2.730	£2.621	
6	£2.170	£2.400	£2.730	£2.890	£2.680	£3.010	£3.165	£2.850	£2.778	
7	£4.470	£4.540	£5.280	£5.550	£5.680	£6.220	£6.360	£6.120	£5.895	
8										

Task 3

Customise the Sparklines to highlight the highest and lowest values

Step 1

Select one of the Sparklines you created

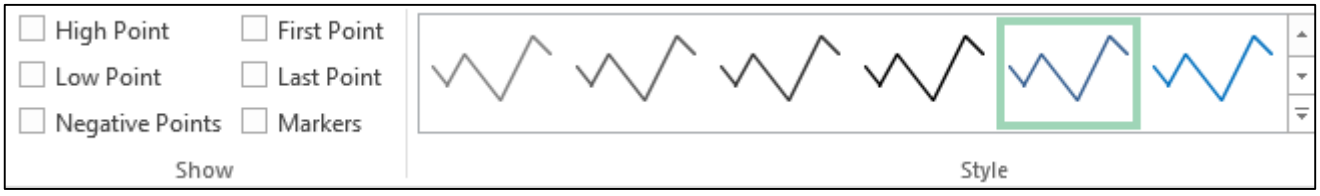
Step 2

From the **Sparkline Tools** tab check **High Point** and **Low Point** in the **Show** group

This will highlight the highest and lowest points of data in the Sparkline group

Step 3

Select one of the many different design styles, see below



Task 4

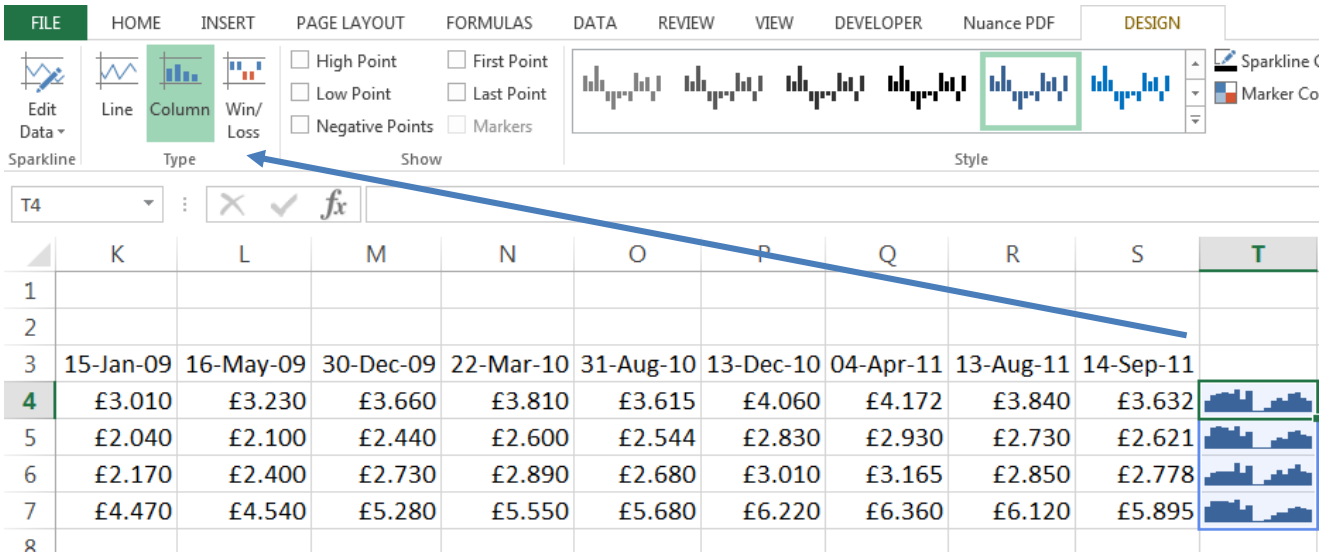
Change the Sparkline to a column type

Step 1

Select another of the Sparklines you have created

Step 2

Click on **Column** in the **Type** group, to change the selected Sparkline to a column Sparkline. Widen the column to provide a better view of the Sparkline.



Task 5

Sometimes, you will want to hide part of the data from a Sparkline

Try the effect of hiding columns, on a Sparkline

Step 1

Select columns **J** to **P** in the worksheet

Step 2

Select **Home | Cells | Format | Hide & Unhide | Hide Columns** (or use the right-click menu)

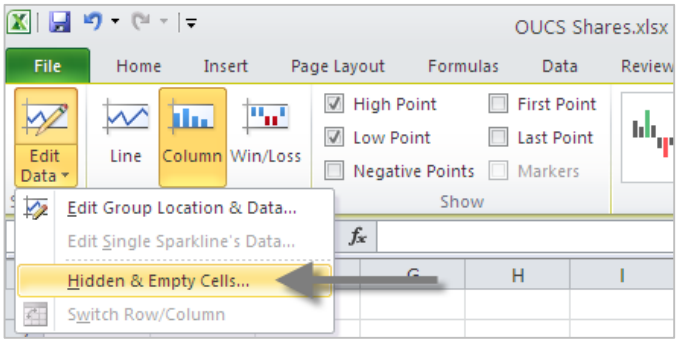
Step 3

Columns **J** to **P** in the worksheet are now hidden and the data there does not show in the Sparklines

Step 4

Select the Sparkline cells

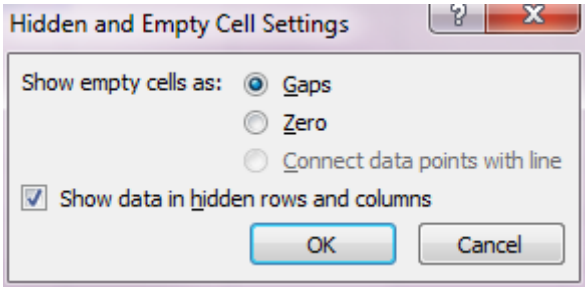
From the **Sparkline Tools Design** tab and in the **Sparkline** group, select **Edit Data | Hidden & Empty Cells**



Step 5

Check **Show data in hidden rows and columns**,

Click **OK**



The completed Sparklines should look the same as below.

	N	O	P	Q	R	S	T
1							
2							
3	22-Mar-10	31-Aug-10	13-Dec-10	04-Apr-11	13-Aug-11	14-Sep-11	
4	£3.810	£3.615	£4.060	£4.172	£3.840	£3.632	
5	£2.600	£2.544	£2.830	£2.930	£2.730	£2.621	
6	£2.890	£2.680	£3.010	£3.165	£2.850	£2.778	
7	£5.550	£5.680	£6.220	£6.360	£6.120	£5.895	

Save your work and close the file

13 What Next?

In all cases, please refer to the IT Learning Programme web page (via www.it.ox.ac.uk/courses/) for further details.

13.1. Courses Which Precede This

Office Fundamentals

Spreadsheets: Techniques for managing and checking data

13.2. Other Courses in Spreadsheets and Statistical Analysis

Spreadsheets: Techniques for managing and checking data

Spreadsheets: Advanced data analysis

Spreadsheets: Summarising data using pivot tables

Spreadsheets: An introduction to working with statistics

... and various courses on using NVivo, R, SPSS and Stata.

13.3. Courses in Programming Languages

For those who need to process large amounts of data, knowledge of a programming language such as C, C++ or VB may be useful.

These are easily accessed with a simple program. An range of courses are available, so see the IT Learning Programme catalogue for further details: www.it.ox.ac.uk/courses/ .

13.4. Other analysis software

MATLAB is a high-performance language for technical computing. The introductory course provides a working introduction to the MATLAB technical computing environment. Themes of data analysis, visualization, and programming are explored throughout the course

SPSS is a package which combines a wide range of tabulation, statistical analyses and graphical displays with the necessary data and file management facilities to exploit them. SPSS is a general-purpose statistical package widely used within the academic community.

Stata is a powerful quantitative software package that provides everything you need for data management and manipulation as well as descriptive, statistical, graphical and survey analysis of quantitative data. A series of courses are available.

14 More Help

14.1. Course Clinics

We encourage everyone to work at their own pace. This may mean that you don't manage to finish all of the exercises for this session. If this is the case, and you would like to complete the exercises while someone is on hand to help you, come along to one of the Course Clinics that run during term time.

More details are available from www.it.ox.ac.uk/courses/

14.2. Downloadable Course Materials and More – the ITLP Portfolio

These course materials are available through the ITLP Portfolio, at http://portfolio.it.ox.ac.uk .

Each course pack includes the course handbook in pdf form and a zip folder of the exercise files that you need to complete the exercises. Archive versions of the course book may also be useful if you use an earlier version of the software.

The ITLP Portfolio helps you find articles, videos, resources and weblinks for further IT study. For some resources, you will be asked for your Oxford (SSO) username and password.

14.3. Further Help

It may be possible for you to use ITLP facilities in IT Services, Banbury Road to work through the exercises in this booklet after the course, or when you don't have access to the applications on your own computer. Contact us on courses@it.ox.ac.uk for details.

The IT Services Help Centre is a good place to get advice about any aspect of using computer software or hardware. For Help Centre opening times, visit www.it.ox.ac.uk/help/gettinghelp/ and follow links to the General Helpdesk, or contact them by email on help@it.ox.ac.uk.

Spreadsheets: Organising and Displaying Data

Traci Huggins

UNIVERSITY OF OXFORD

IT Learning Programme

Today's arrangements …..

Your teacher is: *Traci Huggins*

Your demonstrator is:

We finish at:

This is a hands-on session so get stuck in and have fun – don't be afraid to experiment!

Your safety is important …..

Where is the fire exit?

Beware of hazards

Please tell us if anything does not work

Let us know if you have any other concerns

Your comfort is important ….

The toilets are along the corridor just outside the teaching rooms

The rest area is where you registered;
it has vending machines and a water cooler

The seats at the computers are adjustable

You can adjust the monitors for height,
tilt and brightness

What you will learn today ……

- Working with ranges and tables of data
- Filtering your data
- Subtotal and grouping your data
- Working with and creating different chart types
- Formatting charts
- Creating Histogram's and Sparkline's

Add-Ins …….

During this session you will be using functions and features that are not available by default.

These functions and features need to be added into Excel – to activate the Add-Ins;

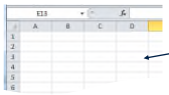
File | Options | Add-Ins |

Then select the Add-Ins available - Instructions on ***Page 44*** *(12.4 Analysis ToolPak) …*

Excel 2010: A Quick Tour/Refresher …..

The Ribbon/Toolbar: where the menus are

The File Tab: called 'Backstage view' – where you go for printing and creating new files



The Grid/Data Sheet: where your data goes, in columns and rows

Refresher: Quotation marks in formula

IMPORTANT: Any text criteria of any criteria that includes logical or mathematical symbols must be enclosed in double quotation marks (“). If the criteria is numeric double quotation marks are not required.

Examples:

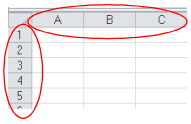
=SUMIF(A2:A5,">160000",B2:B5) - Quotation marks are needed here because we have the more than sign included in the formula.

=SUMIF(A1:A7,"Fruits",C1:C7) - Again quotation marks are needed as we are using text in the formula.

=SUMIF(A2:A5,300000,B2:B5) - Quotation marks ***not*** needed here as the criteria is a numerical only.

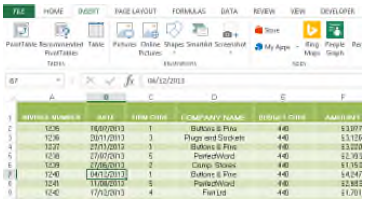
Ranges and Tables in Excel ……

Ranges - consists of a group of cells group together i.e. A1, A2,A3, B1,B2, B3, C1,C2, C3



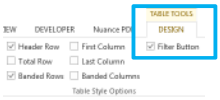
Tables – however is a new way of working with tabular data, tables have additional functionality and are more helpful in appearance than ranges

Creating tables in Excel ……



By converting your range of data to a table you will ensure when further data is added to the table it will be included in the data set

Once your table is created the ribbon will automatically update and give you a tab called Table Tools this will then give you options to format your table accordingly



Filtering Data …….

There are lots of ways in which you can use to Filter your data including;

- Auto filter
- Filter by selection
- Top 10 auto filters
- Filter by colour
- Extract unique records
- Apply an advanced filter
- Filters using AND/OR
- Clear Filters

Summarize your Data ……

Subtotals - is a feature used in Excel to enable you to summarise data in a range.

- Subtotal a range
- Remove Subtotals
- Hide and show details

Exercise; Working with Tables in Excel

Chapters 1-4

Your files are on **H:**

Start at page 52; work through Exercises 1 – 9

Please ask for help if needed!

START AGAIN AT:- about

Charts

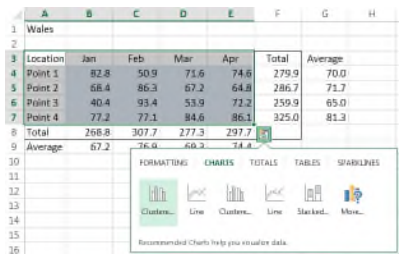
Charts …….

- Creating charts
- Chart options and formatting
- Data series on a chart
- Charts with lines

Creating a chart …..

- Creating an embedded chart
  - Select a series of data
  - Insert tab - choose from Charts
- Creating a chart on its own sheet
  - Select the range of cells, then press <F11>
  - Immediately creates a default chart on a new chart sheet

Creating a Chart …

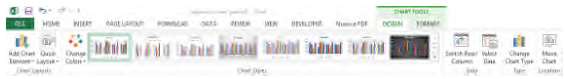


Firstly select the range of data that you need to create the chart

Select the quick analysis from the icon to the left of the data just selected, choose chart, you will then see the following options available to choose your **chart.**

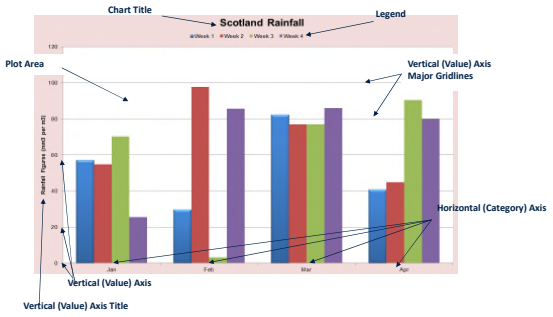
Chart Toolbar …

Design Tab



Format Tab

Labelling/Formatting parts of a chart …



Selecting parts of a chart ….

Select objects on a chart

- Click a chart object once to select it
- Blue handles show which part is selected

Select a data series or a data point

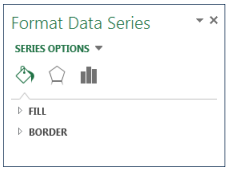
- Click once to select a data series, again to select a data point

Formatting parts of a chart ….

Move or resize chart objects using handles

Format using toolbar buttons

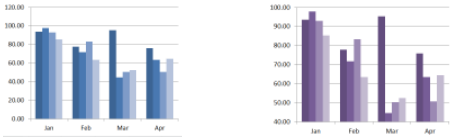
Or select then Format Selection



Controlling the axis scale ….

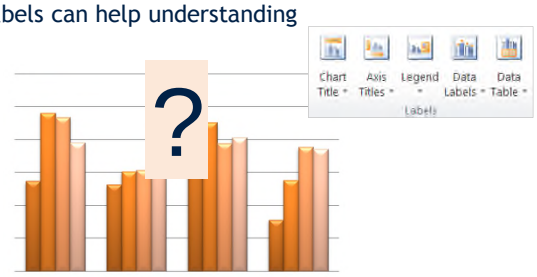
Select the required axis

Set a Minimum or Maximum value as needed



Labelling parts of a chart ….

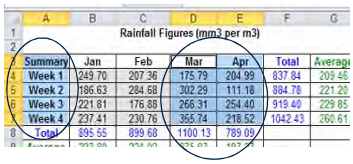
Labels can help understanding



Plotting non-adjacent areas ……

Not all data for charts use adjacent cells.

If you need to create a chart that uses cells from other areas in your data sheet you need to ensure that you select the first set of cells ln order to create chart then select CTLR then select the next range of cells



	A	B	C	D	E	F	G
1	Rainfall Figures (mm3 per m3)						
2							
3	Summary	Jan	Feb	Mar	Apr	Total	Averag
4	Week 1	249.70	207.36	175.79	204.99	837.84	209.46
5	Week 2	186.63	284.68	302.29	111.18	884.78	221.20
6	Week 3	221.81	176.88	266.31	254.40	919.40	229.85
7	Week 4	237.41	230.76	355.74	218.52	1042.43	260.61
8	Total	895.55	899.68	1100.13	789.09		

Adding a data series ….

Inserting another data series on an existing chart

Copy and **Paste** the additional data

or

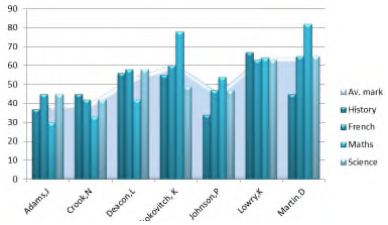
Chart Tools | Design | Select Data

Click 

and select the data range to add

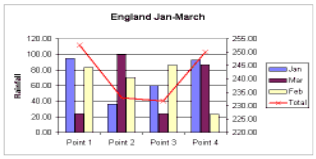
A chart with mixed types ….

Make one data series stand out, use a different chart type



A chart with a secondary axis ….

One series has a different range

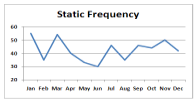


Better to show the line chart against a different value axis scale

XY-scatter charts ….

Line chart

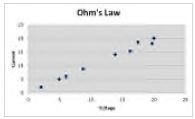
Category information evenly spaced along the x-axis



X-Y Scatter chart

Has two numerical axes

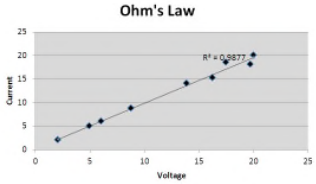
Shows one set of data along the x-axis and another set along the y-axis



Trend lines on a scatter chart ….

Trend line

R-squared

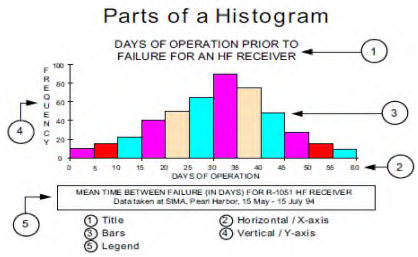


Sparkline's …….

	A	B	C	D	E	F	G	H
1	Exam Results							
2		A	B	C	D	F		
3	Writing	8	5	3	3	2		
4	Reading	10	3	5	2	1		
5	Listening	5	8	20	2	2		
6	Speaking	7	8	5	1	0		
7								

Sparkline's can be easily added with just a few clicks of the mouse. They are dynamic and update automatically when the source data changes

Histograms ……



A Histogram is a chart that shows a visual impression of the **distribution of data** across categories and is commonly used to summarise a long list of data

Other Excel Courses …..

Excel: Techniques for managing and checking data.

Excel: Creating professional data views.

Excel: An introduction to working with statistics

Excel: Advanced data analysis

Excel: Summarising data using pivot tables

Excel: Arrays, Macros and VBA

http://portfolio.it.ox.ac.uk/

Other Courses …..

- Course Clinic
- IT Help Centre
- Intro to statistics

Exercises – Creating and Formatting Charts…

Exercises: 10 - 25

FILES are on **H:\ Course Files for Excel 2010**

Please ask for help if needed!

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