



INFORMATION SYSTEMS SERVICES

Charting in Microsoft Excel

This document contains a series of exercises in creating and formatting charts with Excel.

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Format Conventions

In this document the following format conventions are used:

Commands that you must type in are shown in bold Courier font.	WIN31
Menu items are given in a Bold, Arial font.	Windows Applications
Keys that you press are enclosed in angle brackets.	<Enter>

Feedback

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Introduction

About Spreadsheets

Spreadsheets were originally only designed as calculation tools. People seemed interested only in the numerical results of their calculations. However, it rapidly became apparent that having done the calculations they needed to present the results in a manner that was interesting and clear to other people. Spreadsheets therefore became data presentation tools as well as numerical calculation tools.

Charting is one of the clearest methods of presenting bulk numerical data. The way you present it, however, depends on what you want your audience to gain. There are two main reasons for drawing charts:

- as part of some data analysis so that you can see more clearly what the numbers mean.
- as part of a presentation to impress other people.

These two requirements are subtly different. The first requires clear, uncluttered, accurate graphs. The latter requires impressive looking graphs that may or may not show the data clearly. Excel can produce both.

Excel has wide range of graph types including column, bar, line, pie and area, with several sub-types, including 3-D charts, for each type. The graph types are a mixture of graphs appropriate to analysis and presentation.

This document gives a set of exercises in charting with Excel, and these exercises should be appropriate to anyone wanting to use Excel to draw graphs. The document gives practice on editing different areas of the chart.

Prerequisites

It is assumed that you already know how to open, close, save and print an Excel spreadsheet and that you know how to enter data, edit data and create simple formulae. If you are new to Excel it will be necessary for you to read and work through the following document before attempting these exercises:

Introductory Exercises in Microsoft Excel XP TUT 102
or
Introductory Exercises in Microsoft Excel 2000 TUT 46

Extensive online help is also available through the Excel **Help** menu.

If you wish to investigate some of the other facilities in Excel then the following documents are also available:

Formatting Data in Microsoft Excel TUT 48
Writing Formulae with Microsoft Excel TUT 47

Task 1 Getting Started

Objective An existing unformatted spreadsheet will be used for this exercise. In order for you to be able to use this spreadsheet you will need to copy it into your own home directory.

Instructions To do this you will download the file from the ISS Web site.

Comments You will need this file in order to complete these exercises.

Activity 1.1 Open the Netscape web browser and go to the URL:

`http://www.leeds.ac.uk/iss/documentation/tut/index.html`

Activity 1.2 Scroll down to TUT 49 and right-click on the **tut49.xls** link. Choose **Save Link As...** In the **Save As** dialog box choose a suitable directory to store the file in and click **<Save>**. Close Netscape.

Activity 1.3 Run Excel from the **Start** menu or by clicking on its icon on the desktop.

Task 2 Opening The Example File

Objective To open the example sheet from within Excel.

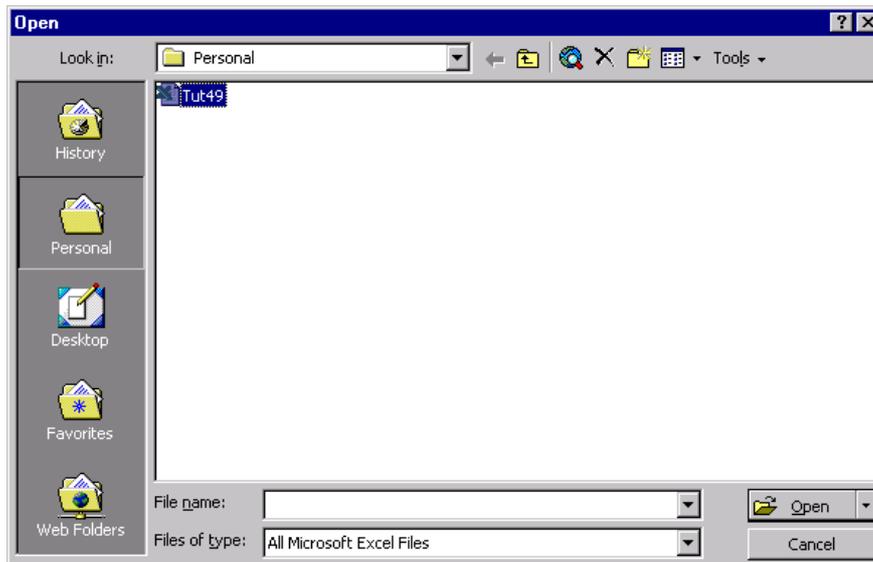
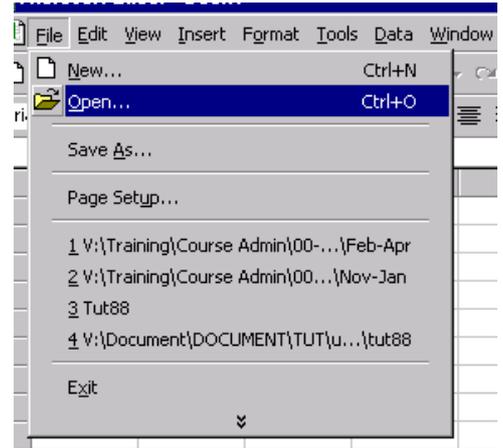
Instructions You will use the **Open** button on the toolbar.

Comment Opening existing files is more common than opening new ones. Fortunately the process for opening files in Excel is the same as it is for practically every other Windows program.

Activity 2.1 Select the **FileOpen** button on the toolbar , or select the **Open** command under the **File** menu.

Activity 2.2 The **Open** dialog box displays as shown below:

Select the file **TUT49.XLS** and click on **<Open>**. The example spreadsheet file will load.



	A	B	C	D	E	F	G	H
1	Sales for VINO plc (1991/2)							
2								
3	(Figures in 000's)						<i>Bonus</i>	15%
4								
5								
6		<i>Q1</i>	<i>Q2</i>	<i>Q3</i>	<i>Q4</i>	<i>Actual Sales</i>	<i>Target</i>	<i>Bonus</i>
7	<i>SALLY</i>	£40.00	£57.00	£52.00	£65.00	£214.00	£250.00	£32
8	<i>ANN</i>	50.00	69.00	69.00	90.00	278.00	220.00	£42
9	<i>RAY</i>	53.00	75.00	71.00	82.00	281.00	250.00	£42
10	<i>JOHN</i>	44.00	59.00	38.00	70.00	211.00	200.00	£32
11								
12						984	920	

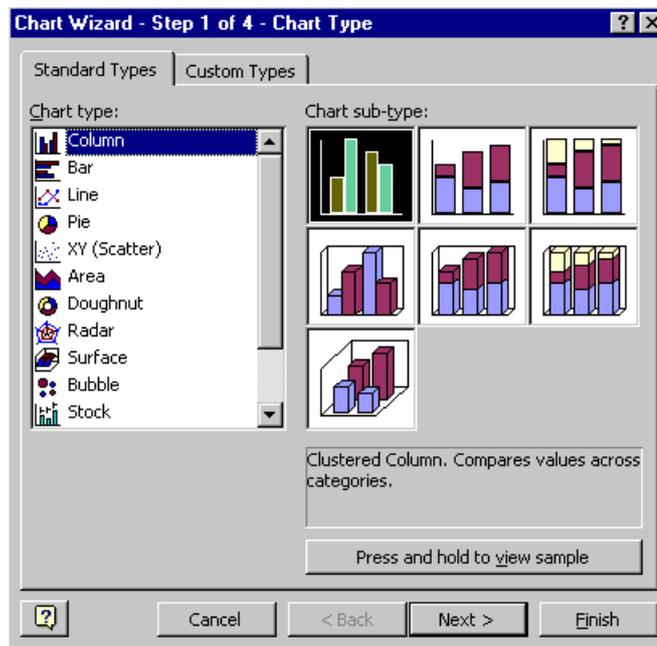
Task 3 Creating A New Chart

Objective To create a new chart in a separate worksheet from the data.

Instructions You will use the **Chart** option from the **Insert** menu and then use the **Chart Wizard** to select a range of data to graph.

Comment With this method the chart will be created in a separate sheet, but can be embedded later if necessary.

Activity 3.1 From the **Insert** menu choose the **Chart** option. The **Chart Wizard** dialog box appears as shown below:



Activity 3.2 Follow through the Chart Wizard steps, filling the options in as given below:

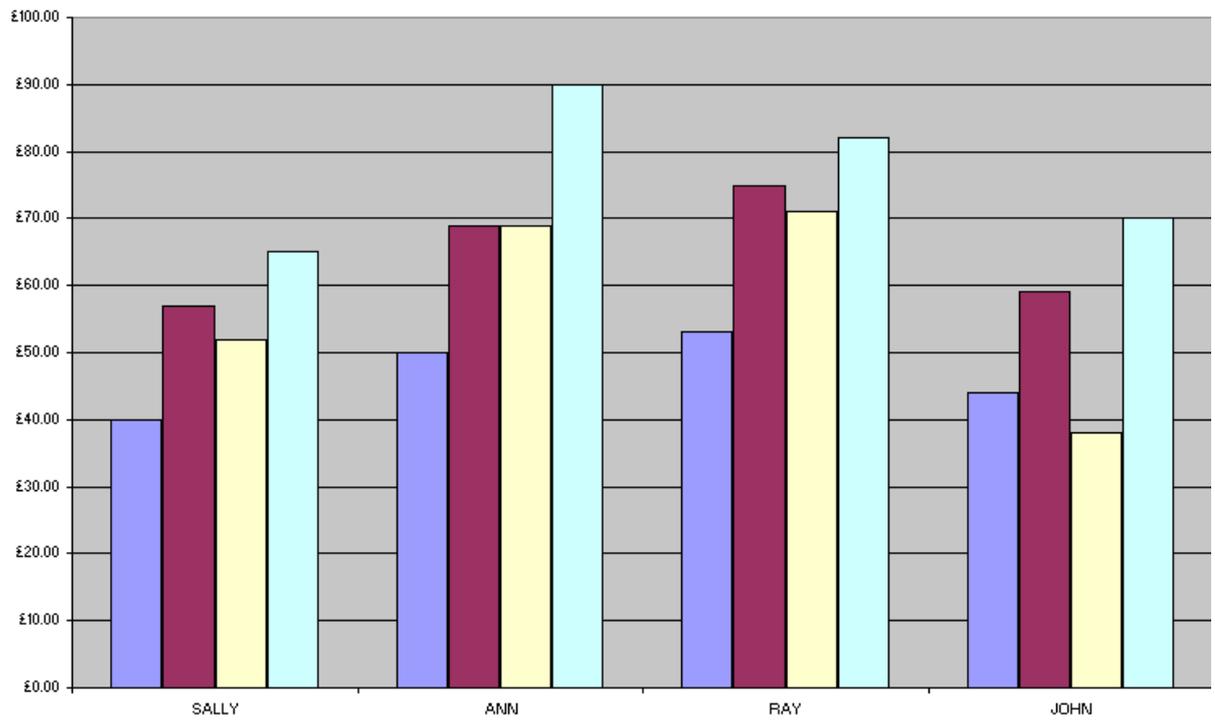
Step One Select the **Column** graph from **Chart type:** and the **Clustered Column** from the **Chart sub-type:** Click on **<Next>**.

Step Two On the sheet select the range A6 to E10. You may need to move the Chart Wizard dialog box first. The range should appear in the **Data range:** box as **=TUT49!\$A\$6:\$E\$10** In the **Series in:** section, check the **Columns** radio button. Click on **<Next>**.

Step Three Select the **Legend** tab and uncheck the **Show Legend** box. Click on **<Next>**.

Step Four Check the **As new sheet:** box and then click on **<Finish>**.

When the Chart Wizard has finished, your chart should look like the one shown opposite:



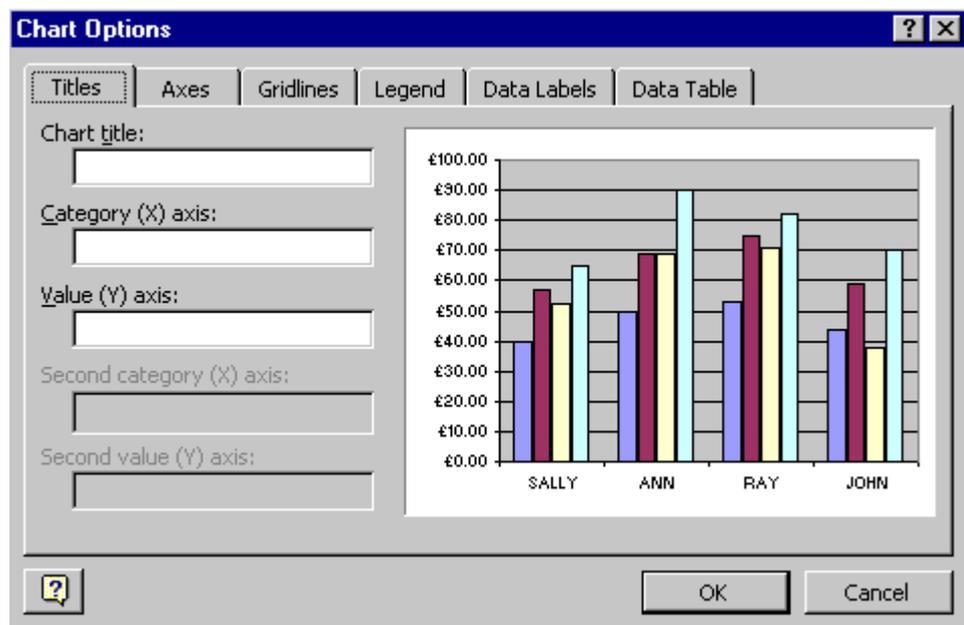
Task 4 Adding Titles And Labels

Objective To add a title and axes labels to the graph.

Instructions You will use the **Chart Options...** option from the **Chart** menu.

Comment Charts, like numbers, will be meaningless unless there is information on what the chart is about and what the elements of the chart are supposed to represent.

Activity 4.1 From the **Chart** menu select the **Chart Options...** option. The following dialog box appears:



Activity 4.2 Select the **Titles** tab if it is not already selected. Add the following titles to the appropriate boxes:

Chart Title: Graph of Sales per Region for Each Sales Rep

Category (X) Axis: Sales Reps

Value (Y) Axis: Sales in Thousands

Click <OK>.

You will be returned to the chart worksheet, which now has three titles on it.

Task 5 Adding A Chart Legend

Objective To add a legend to the chart that will inform the reader what the different data series are – i.e. what the different colours refer to.

Instructions You will use the **Legend** tab from the **Chart Options** dialog box.

Comment Most charts are plotted with more than one set of data, the purpose of the chart often being to compare one set of data against another. It is therefore essential to label the different sets of data. You do this using a legend.

Activity 5.1 From the **Chart** menu select the option **Chart Options...** and click on the **Legend** tab. Check the **Show legend** box and click on **<OK>**. The

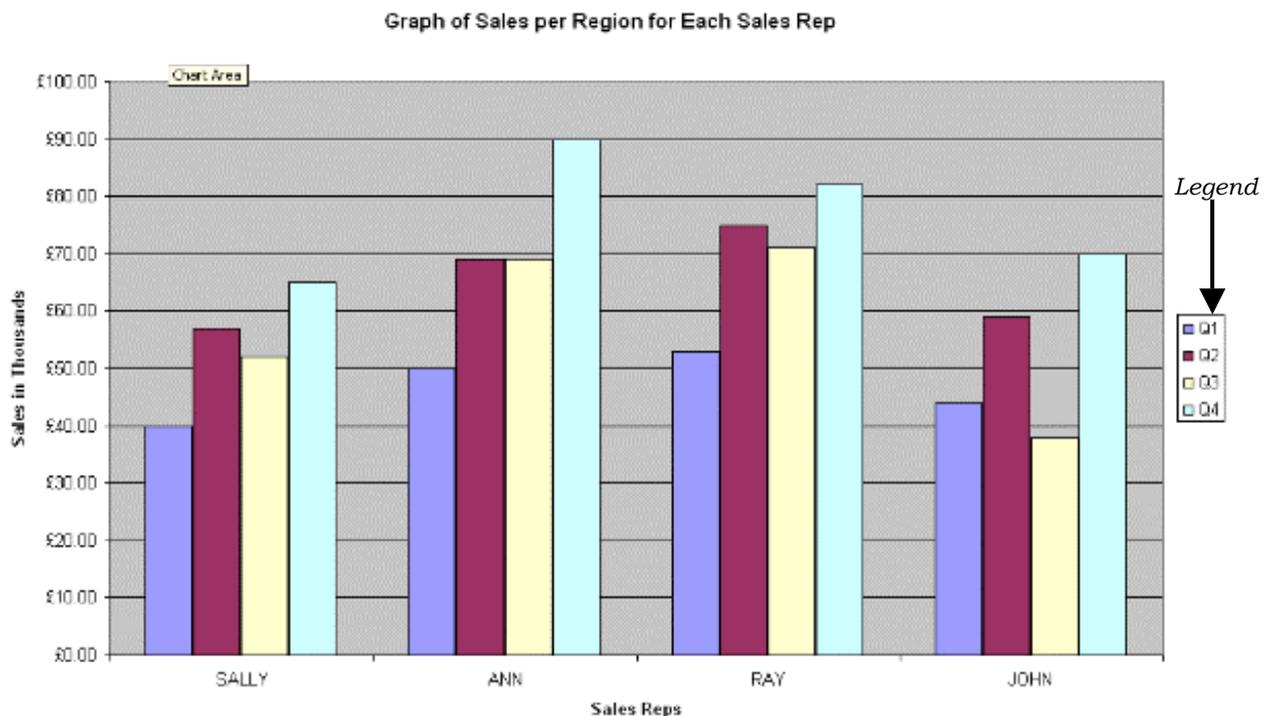
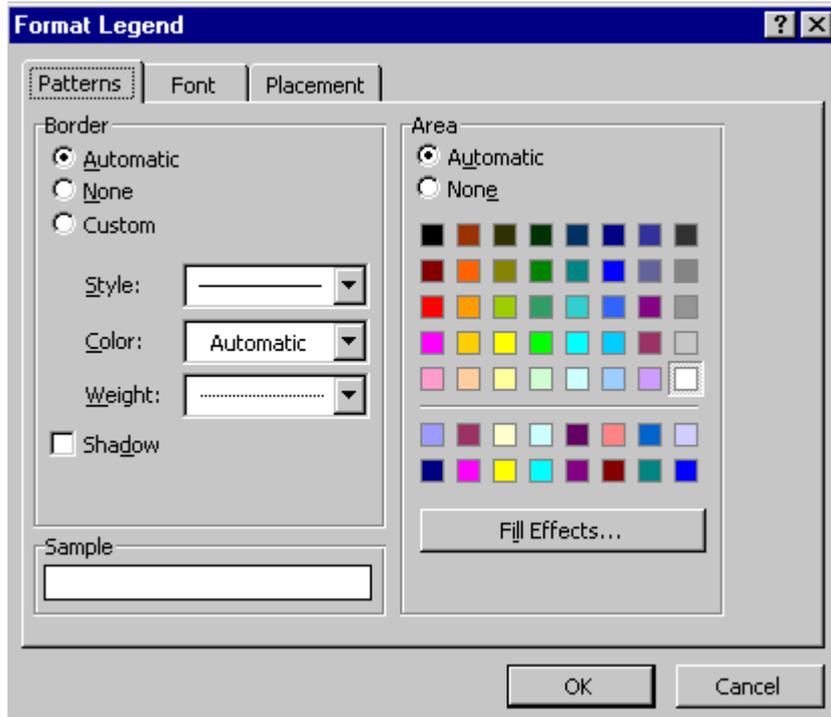


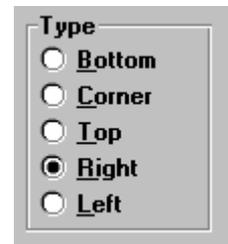
chart now has a legend as shown:

Activity 5.2 Click on the Legend to select it and choose **Selected Legend...** from the **Format** menu. The following dialog box appears:



This box defines everything for the legend box, including the border and the patterns behind it. Patterns will be discussed in more detail later. For now, just click the tab marked **<Placement>**.

This tab defines where the legend is positioned on the graph. Select the **Bottom** radio button and click **<OK>**. Your legend should appear in a long thin box just underneath the label of the X-axis.



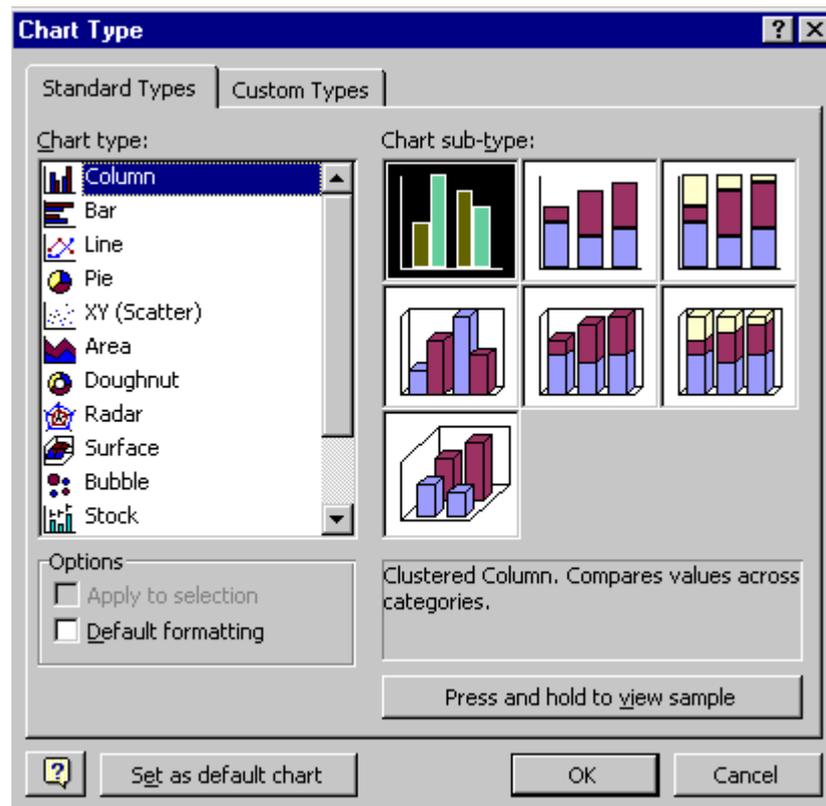
Task 6 Changing The Chart Type

Objective To change the type of chart plotted whilst using the existing set of data.

Instructions You will use the **Chart Type...** option from the **Chart** menu.

Comment Different graph types are useful for different sorts of data or for different emphasis on the data.

Activity 6.1 From the **Chart** menu select **Chart Type...** The following dialog box appears showing the alternative graphs available:



Activity 6.2 Select **Area** from the **Chart type:** box, select the second subtype and click on **<OK>**. The graph alters to show an area graph. Note that the Y axis has altered its scale for the new graph. This type of area graph stack data so that the value for the top line of, say, Q2, is equal to the sum of all the values in Q2.

Before continuing, put the graph back to the column graph you originally had by going back to the **Chart Type...** dialog box (**Clustered Column** graph).

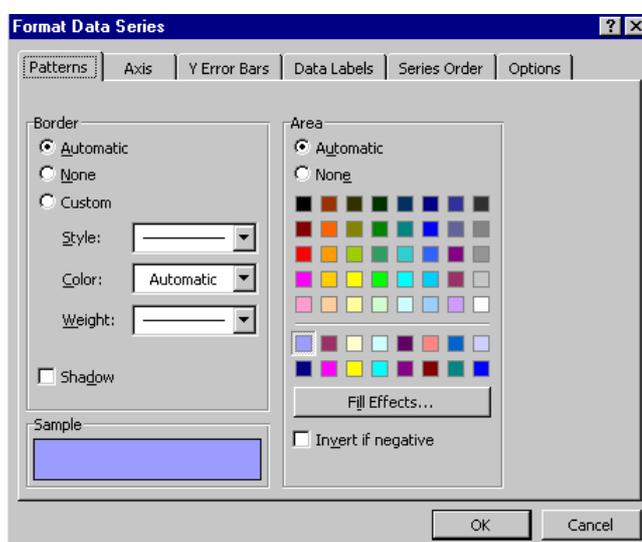
Task 7 Editing The Displayed Data

Objective To alter the patterns and format of the series that are displayed.

Instructions You will use the **Selected Data Series...** option from the **Format** menu.

Comments You will sometimes want to alter the colour or pattern a series is displayed in. This will occasionally be for practical purposes – you want to replace colours with patterns for a black and white printer – or for emphasis.

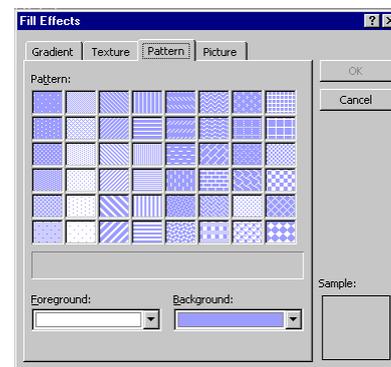
Activity 7.1 Click on any of the columns in the graph representing Q1. Little boxes should appear in some or all of the purple columns across the graph. Then select the **Selected Data Series...** option from the **Format** menu. The following tabbed dialog box appears:



Activity 7.2 Click on the **Patterns** tab. In the **Area** section select the white colour box. The **Sample** box should turn white.

Activity 7.3 Now click on the **<Fill Effects...>** button and click on the **Pattern** tab in the **Fill Effects** dialog box. This box selects the pattern and the background and foreground colours of the pattern. Choose black for the foreground colour by clicking on the drop down arrow in the **Foreground:** box, choose white for the background colour and choose a pattern from those shown.

Activity 7.4 Click on **<OK>** to close the **Fill Effects** dialog box and **<OK>** again to close the **Format Data Series** dialog box. Your change of colour and pattern is implemented on the Q1 data series.



Activity 7.5 Now try changing the other three data series to be black and white but with different patterns. Notice that the legend records the change in patterns as you do them.

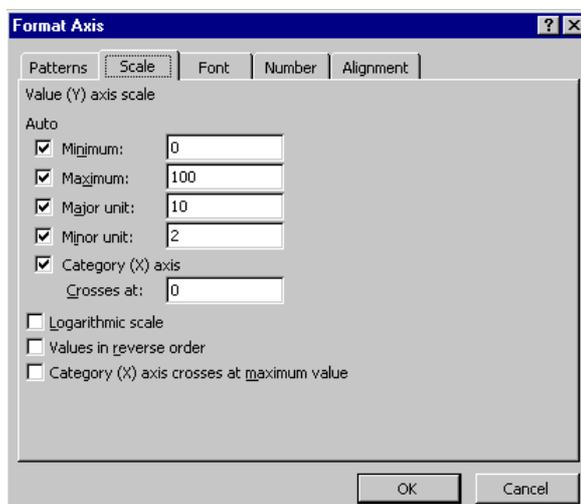
Task 8 Editing Axes

Objective To alter the scales on which graphs are plotted.

Instructions You will click on the axes you want to alter, then use the **Selected Axis...** option from the **Format** menu.

Comments It is often desirable to change the scale of which axes are plotted. You can change it from a linear to a logarithmic scale, or you can change the starting and finishing values on the Y-axis to alter the appearance of a gradient.

Activity 8.1 Click on the Y-axis. Two little boxes should appear, one at either end of the axis. Now select the **Selected Axis...** command from the **Format** menu. A dialog box will appear. Click on the tab labelled **Scale**. The box will appear as shown below:



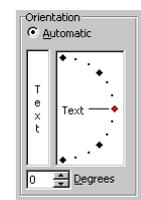
This box allows you to alter the starting value, finishing value and increment units for the axis. You can also specify where you want the X axis to cross.

Activity 8.2 Edit the box as follows:

Minimum:	30	Maximum:	80
Major Unit:	5	Minor Unit:	1

You will note that as you go through the boxes, editing the contents, the check box on the left-hand side becomes cleared. This is because you are removing the default values that Excel provides and inserting your own. When you have finished click **<OK>**. The chart has altered so that the differences between the individual sales reps is now more pronounced.

Activity 8.3 Now double-click on the X-axis. The **Format Axis** dialog box appears again, but this time select the **Alignment** tab. This controls the orientation of the text on screen. Change the orientation by typing in **90** in the **Degrees** box or by clicking on the uppermost diamond. Click on **<OK>**. All the text labels for the X-axis will be rotated 90 degrees.



Task 9 Editing The Plotted Data

Objective To alter the data that you actually want plotted on the graph.

Instructions You will use the **Source Data...** option from the **Chart** menu.

Comment It is sometimes the case that you either want to add an extra series to what you are plotting, or else you want to use the format of the current chart to plot a new set of data with. To do this you change the *Data Series* you plot.

Activity 9.1 From the **Chart** menu select the **Source Data...** option. The source data is displayed with an active dotted line around it.

Activity 9.2 Using the mouse, select the data in the range A6:G10. You may have to move the **Source Data** dialog box out of the way to see the range you want to select. When you have done that click on **<OK>**.

Activity 9.3 You will notice that the Y-axis is now unhelpful as it still has the settings we gave it in the previous exercise. Double click on the Y-axis and reset all the **Scale** settings to their defaults.

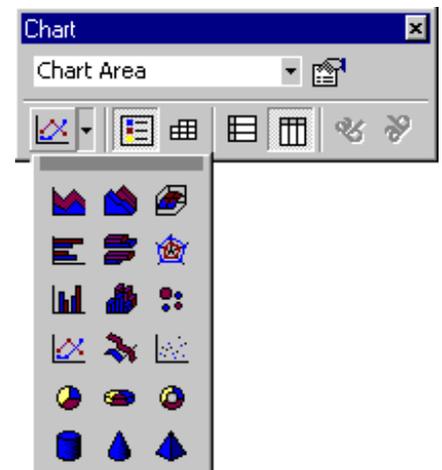
The graph as it stands isn't terribly informative. One alternative is to change its subtype to a stacked column graph.

Activity 9.4 Using the **Chart Type...** option on the **Chart** menu, select the **Stacked Column** chart sub-type and click **<OK>**. The whole graph is altered to become a stacked column chart.

Activity 9.5 Ever since you started working on the chart you may have noticed a small toolbar floating in the top right hand corner of your screen, or you may have more buttons on the toolbar. This is the **Chart Toolbar** and it can be used to shortcut menu commands. If it is not floating as a separate toolbar it may be 'docked' on the existing toolbar. If you cannot see it on your screen, you can open it by checking the **Chart** option under **View > Toolbars**.

Select the **Actual Sales** series by clicking on one of its data areas with the mouse. A box should appear in some or all of the columns on the chart. Now go to the **Chart Type** drop down arrow in the chart toolbar. A palette of possible chart types appears. Select the line chart.

The graph changes so that the **Actual Sales** form a line graph over the top of the column graph. Now select the **Target Sales** series and do the same for that.



Task 10 Changing Data Orientation

Objective To change the way the data is plotted on the chart to give a different emphasis.

Instructions You will use the **Source Data...** option on the **Chart** menu to alter the data you are plotting.

Comments You are now going to alter the graph so that it displays the data by quarter rather than by sales rep. This will give a feel for what is happening to the sales over time.

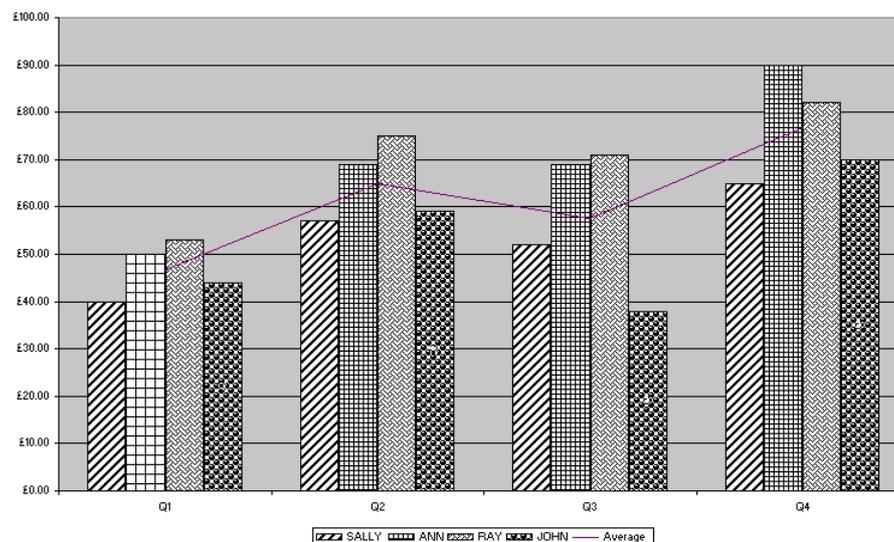
Activity 10.1 Select **Chart > Source Data...** The original data is displayed with an active dotted box around it. You may need to move the **Source Data** dialog box to see all the data.

Activity 10.2 Using the mouse drag out around the range A6:E11 so that the range is surrounded by an active dotted box.

Activity 10.3 In the **Series in:** section click on the radio button **Rows**. This will put the quarters on the X-axis with the Sales Reps as the different series. Click on **<OK>**. You will be taken back to the chart sheet with stacked columns representing the quarterly totals and a line representing the **Average** data.

Activity 10.4 Make sure the chart is displayed as unstacked columns (**Cluster Column** sub-type) and all the patterns are black and white.

Activity 10.5 Click on any **Average** column (the fifth column in each quarter) to select the Average series. From the **Chart** menu select **Chart Type > Line**. Click on **<OK>**. The chart should now look similar to the one below:



Task 11 Adding A Trendline

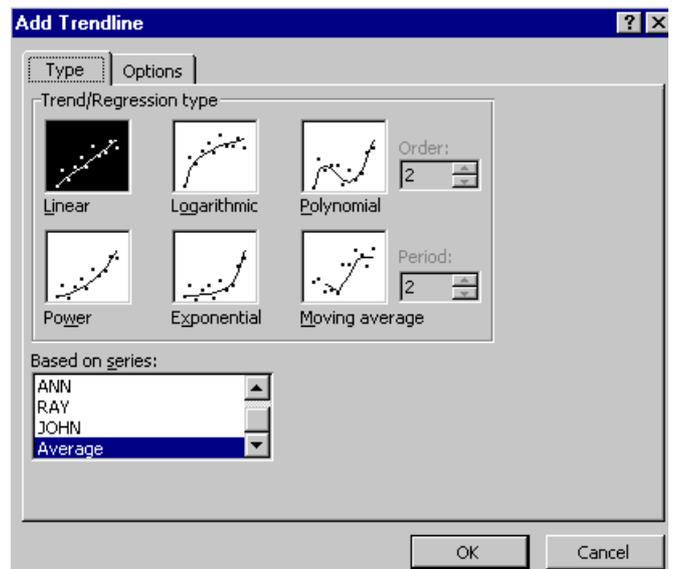
Objective To add a simple regression line to the data plotted on the chart.

Instructions You will use the **Add Trendline...** option from the **Chart** menu.

Comments Excel charting also allows you to perform some analysis on the data your graph is displaying.

Activity 11.1 Using the mouse, select the line representing the average score for the reps so that the boxes along the line are highlighted. From the **Chart** menu select the **Add Trendline...** option. The dialog box shown appears:

Choose the **Linear** trend box (it should already be selected), make sure **Average** is selected in the **Based on series:** box and click **<OK>**. A thick black line will appear on the chart representing the linear trend of the average for the Sales Reps over the four quarters.



Activity 11.2 Before you finish, you may want to tidy the graph up a bit. Here are some suggestions:

- Double-click on the *trendline* to call up the **Format Trendline** dialog box. Change the line weight to be thicker so that it stands out more.
- Change the orientation of the X-Axis labels so that they are easier to read.
- Change the X-Axis title to read "**Sales per Quarter**".
- Double-click on the chart title to call up the **Format Chart Title** dialog box. Under the patterns tab give the chart title an ordinary weight border with a shadow.
- Double-click inside the axes but not on a data series to call up the **Format Plot Area** dialog box. Change the colour to a light grey or white.
- Double click on the tab labelled **<Chart1>** at the bottom of the window. You can now type your own name for the chart sheet. Type the name **Quarterly Sales** and press **<Enter>**.

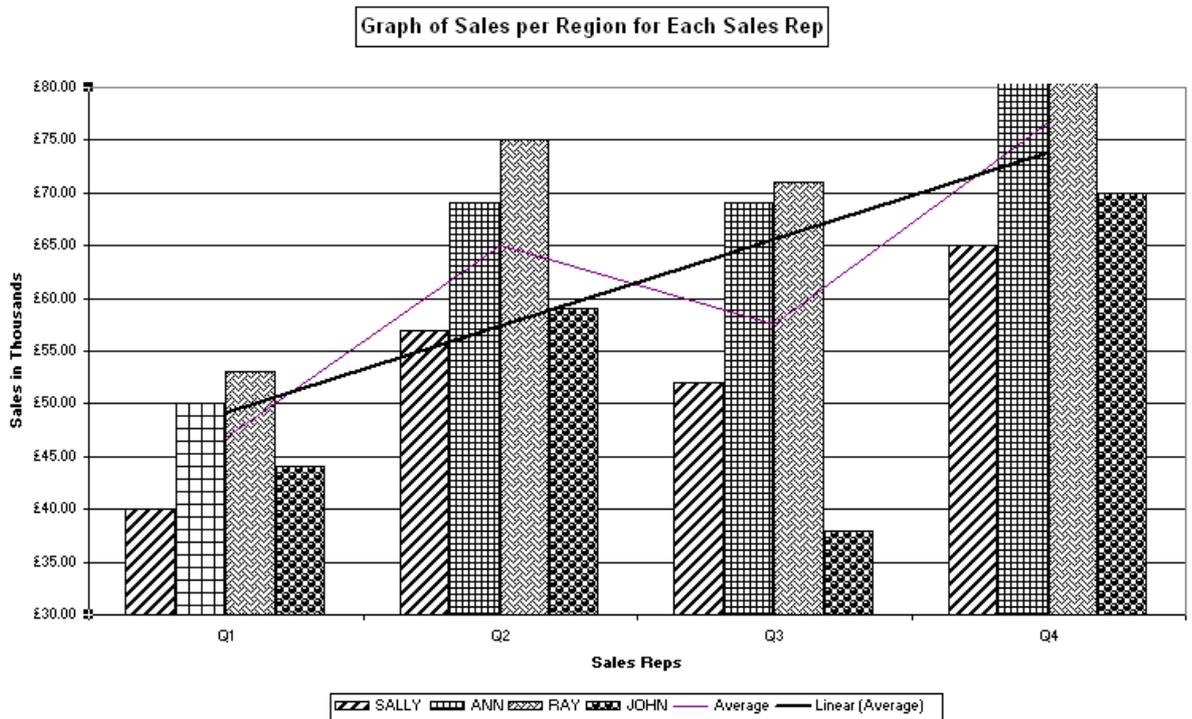
Task 12 Finishing Excel

Objective To quit Excel.

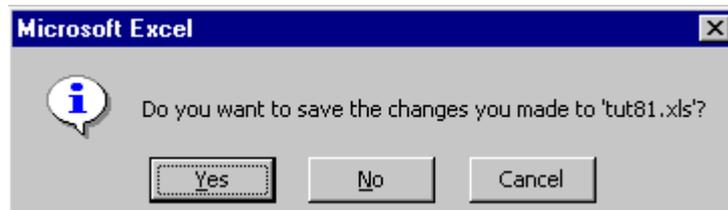
Instructions You will use the **Exit** option from the **File** menu.

Comments You should always quit any computer program when you have finished your session. Always shutdown Windows NT before switching off the computer. Also never leave a computer whilst you are still logged on to it as others may use your username and could potentially damage your files.

Activity 12.1 After finishing the exercises you should have a graph that looks similar to the one shown below:



Activity 12.2 Select the **Exit** option from the **File** menu. Excel asks you if you want to save your document before it lets you quit.



Click either **<Yes>** or **<No>** depending on whether you want the changes saved. Once you have done that Excel will quit. If you click on **<Cancel>** you will be returned to your unsaved work to continue.