The University of Sheffield

CiCS

Introduction to...

Excel XP

Contents

1. Introduction

This document introduces you to the Excel spreadsheet. It outlines the general structure of spreadsheets, then tells you specifically how to use Excel. For several years, the University of Sheffield has provided versions of Microsoft Excel. Gradually, we are moving towards Excel 2000. Some members of staff already use Excel 2000 on the networked Windows 98 service, and at some stage Excel 2000 will be available on the CICS Managed NT Service.

2. Overview of Spreadsheets

A spreadsheet is a numerical tool that is easy to use but deceptively powerful. It revolves around collections of worksheets, each of which consists of rows labelled numerically, and columns labelled alphabetically. At each intersection of a row and a column is a cell, referred to by its position, **A3**, **B1 C265**, etc.
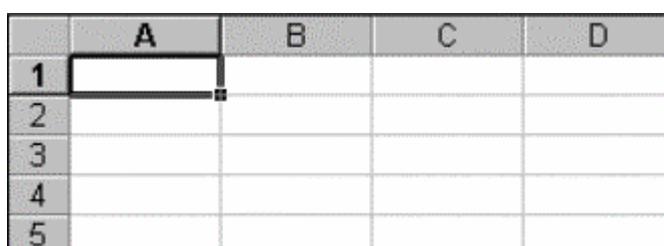
Into these cells you type data, often building columns of numbers with text labels. You can then operate on these numbers by adding functions. These might produce running totals of columns, multiply numbers in adjacent rows together, or do any kind of numerical operation. The clever part happens when you change the data, however, because spreadsheets work dynamically. This means that totals, or results of calculations, are updated automatically when any relevant number in the worksheet changes.

An obvious example of the use of a spreadsheet is a bank statement. This contains a description of transactions in one column, credits in another column, and debits in the third column. At the top of the sheet is the previous balance and at the bottom is the new balance, which is worked out as

new balance = previous balance -total debits + total credits

Following on from this, business balance sheets are another popular example of spreadsheets at work.

On a more imaginative level though, spreadsheets can be used to record scientific measurements and dynamically calculate the parameter of interest, and at Corporate Information and Computing Services a spreadsheet is used to record course bookings and attendance in order to forecast demand for the next session.

3. Getting Started

3.1 Starting Excel

To use Excel you first need to start up your computer and log on with your usual username and password. Click the **Start** button and select **Programs,** then from the sub-menu that appears select **Microsoft Excel**. There are many alternative ways to start Excel; these are covered in a later section. When Excel loads you will see the following screen.
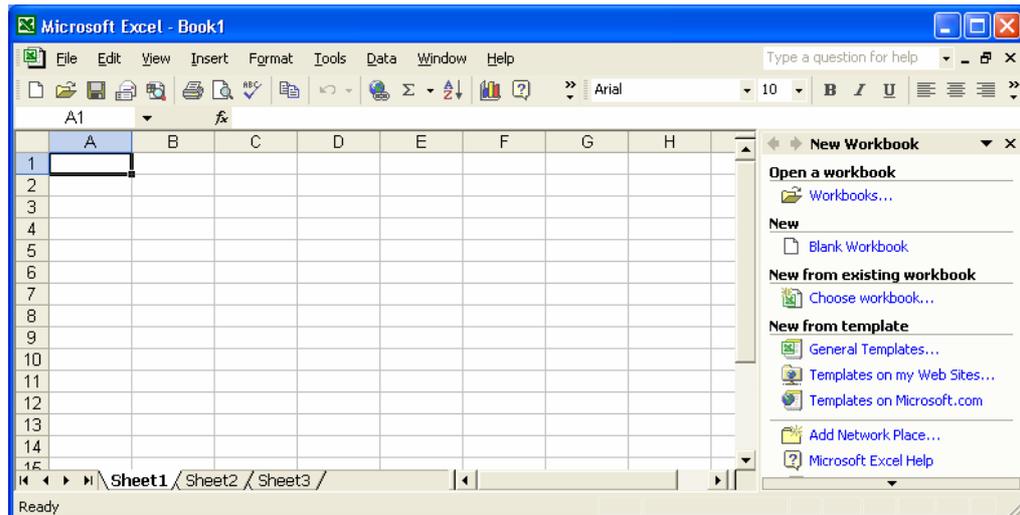
The Workbook

You will notice that the title bar is labelled **Microsoft Excel - Book1**. Excel handles workbooks, which are collections of worksheets. You will also notice that below the displayed cells there are a series of tags labelled **Sheet1**, **Sheet2**, and **Sheet3**. By clicking on a tag with the mouse you will display the contents of that particular worksheet.

You can use the workbook structure of Excel to store related tables together, but without cluttering a single sheet.

3.2 Selecting Cells

If you click on a cell with the mouse you will see its name appear on the left hand side of the formula bar. As you click on different cells the name in the formula bar will change accordingly. Alternatively, you can select different cells in the worksheet using the arrow keys or the **Enter** and **Backspace** keys.

You can select a range of cells by clicking on a single cell at one corner of the range then, with the mouse button held down, drag the selection so that it extends over the other cells. To select an entire row of cells you can click on the row number, and you can select columns by clicking on the appropriate letter. Finally, you can select the entire worksheet by clicking on the grey box against the letter **A** and number **1**.

3.3 Changing to a New Worksheet

If you want to include some related data, but don't want to overload your current worksheet you can begin a new sheet. To do this click on any of the tags below the cells to display the corresponding sheet.

To make individual sheets of data easily recognisable you can name each sheet that you use. To name the current sheet double click the sheet label (**Sheet1**, **Sheet2** etc) to select it, then enter a new name for that worksheet and press **Enter**. If you need more than three worksheets you can select **Worksheet** from the **Insert** menu.

3.4 Entering Data

To enter data into a cell first select the cell. As you start to type you will notice that buttons materialise in the formula bar and that the data appears simultaneously in the formula bar and in the selected cell.

Having typed the data for that cell you can then press the **Enter** key or click on the tick button. The formula bar will then clear leaving only the cell reference displayed.

If you need to edit the contents of a cell you can do this via the formula bar. First click on the cell in question so that its contents appear in the formula bar. Then click within the formula bar to produce a cursor with which to edit the cell contents.

3.5 Formatting Text

A worksheet containing raw data is not very clear, but you can improve its appearance by applying different formats to some key cells. The most popular formats are available through the following tools on the formatting toolbar.

The two drop-down lists enable you to select the font face and size for the selected cell contents. The first group of three buttons respectively make the contents of selected cells bold, italic, and underlined. The next three buttons align the cell contents respectively to the left, centred, or to the right.

The last button is very useful for headings. If you select a single cell, then extend the selection horizontally across adjacent cells you can then click on this button to centre the single cell contents across the selected range.

Finally, you can adjust the width of any column by positioning the cursor between two lettered column headings and dragging the column wider. To automatically adjust any column to accommodate its widest entry, simply double click the column label. Row heights can be adjusted in a similar way.

3.6 **Formatting Numbers**

To clarify your worksheet further you can specify the format in which selected numbers are displayed.

To do this you need to select the cells containing the numbers in question, then pull down the **Format** menu and select **Cells**. In the dialog box that appears click on the tag labelled **Number**. You will get a list of various categories of numbers and for each category there will be a second list containing possible formats. You can then choose a format for your selected data.
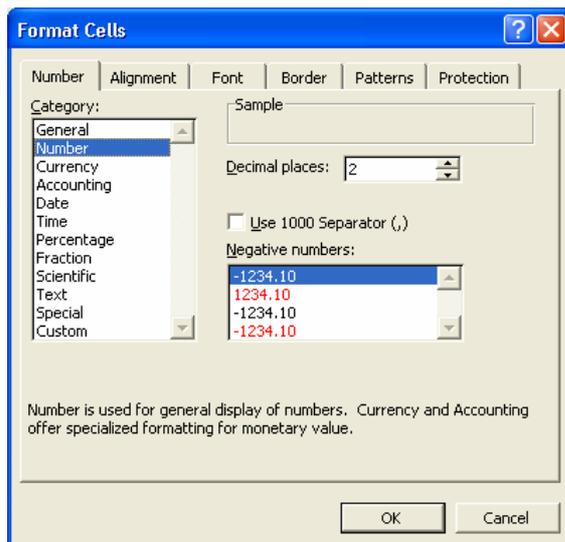
In addition there are buttons in the toolbar to quickly format numbers to be currency, percentages, or fixed numbers of decimals.

3.7 **Formatting Dates**

If you choose the date format for numbers, you have a great deal of control over how your dates appear in the worksheet. If you select **Date** from the dialog box above you will be offered a choice of formats, but you can create your own format by clicking the **Custom** option. You can then build a date format using the letters d, m and y for date month and year as follows

dd	two digit day number	01, 02, … 31
ddd	three letter day	Mon, Tue, … Sun
dddd	full day name	Monday Tuesday, … Sunday
mm	two digit month number	01, 02, …12
mmm	three letter month name	Jan, Feb, … Dec
mmmm	full month name	January, February, … December
yy	two digit year	98, 99, 00, …
yyyy	four digit year	1998, 1999, 2000, …

So the date format **dddd dd-mmm-yy** would give dates in the form:

Monday 06-Mar-00

4. Working with Files

4.1 Saving Files

As you type data from the keyboard it will appear on your screen and you can watch as your workbook grows. While you are doing this however, your work is vulnerable; it only exists on the screen and in the temporary memory of the computer. If the machine fails both the screen and memory are wiped clean.

In order to make your work safe you need to make a secure copy of your workbook in a computer file. For those of you new to computing, a file is an entity that sits in your computer and will usually contain one piece of work. In the context of spreadsheets a file will contain one of your workbooks. As you write more and more workbooks you will accumulate more and more files.

To save your file either select **Save** from the **File** menu, or click on the save button in the standard toolbar. The first time you do this for a particular file you will get a dialog box where you can supply a name for your workbook, and specify a place in which to save it.
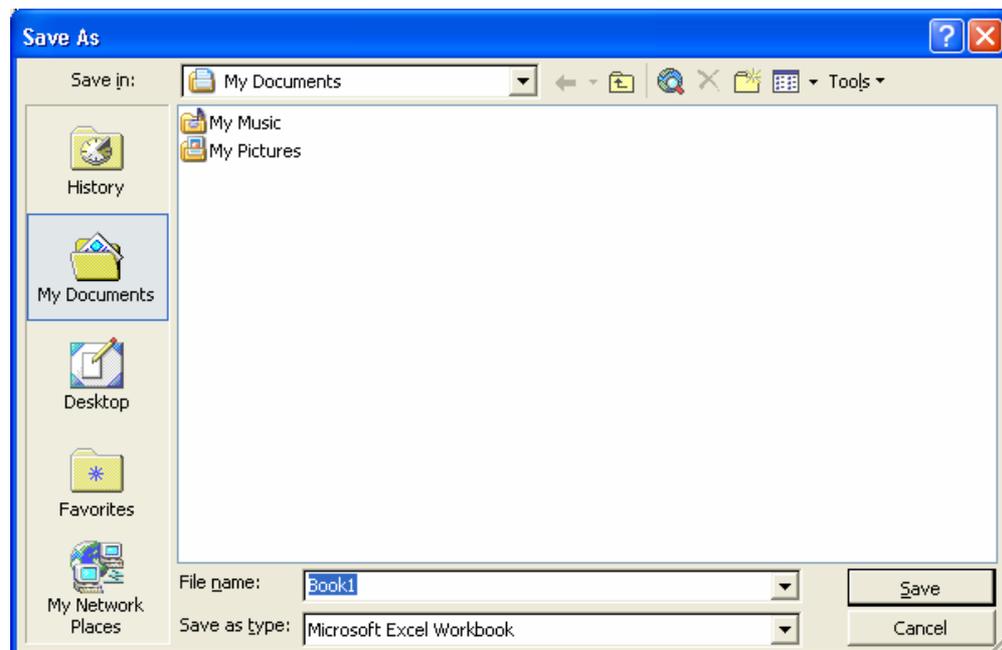
Specify a name for the file in the **File Name** box. A file name can contain up to 256 characters, including spaces and capital letters. Next you need to specify the location for the file. This can be any folder on your hard disk or network account. Initially, Excel will offer you the **My Documents** folder but you can change this by selecting a new drive or folder from the **Save in** menu.

The file name is followed by the extension **.xls** The name helps you identify individual files whereas the extension helps Excel to recognise files that it has been used to create. When you have entered a name click on the **Save** button to save it. All subsequent saves will update the existing file without asking for a filename.

4.2 **Closing Files**

If you have finished working on a workbook for the time being, but want to carry on using Excel to edit a different workbook, you should save your work as described above, then select **Close** from the **File** menu, or click the close button in the workbook window. This will close the workbook down but will still keep Excel running. You can then begin work on your second workbook.

4.3 **Opening Existing Files**

When you want to continue work on a workbook that you started earlier you should select **Open...** from the **File** menu, or click on the Open button in the toolbar to get the following dialog box.
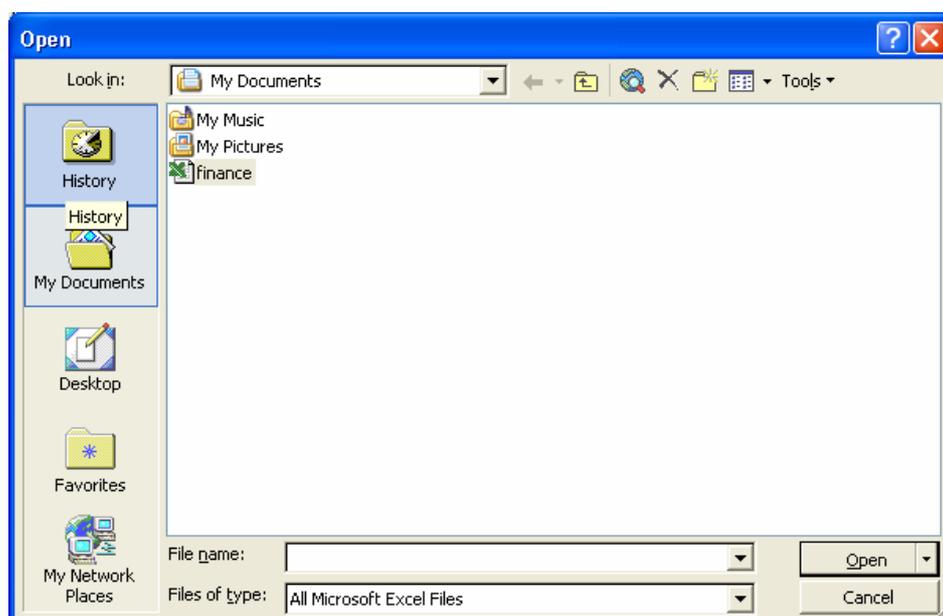
You can then select a file from the list, or use the **Look in** menu to access files in on different drives, or use the **History** button to list your most recently used Excel files. When you have your file selected click on the **Open** button to load it into Excel.

As a shortcut you can open any of your four most recent workbooks by selecting them from a list that automatically appends to the bottom of the **File** menu.

4.4 **Creating a New File**

When you want to start a new workbook click on the New button in the toolbar or select **New** from the **File** menu. This will give you a new screen with a blank workbook area, and a new entry for the Excel workbook will appear on the Taskbar.

4.5 **Exiting from Excel**

When you have finished all your work for the time being, and all your workbooks have been saved, you can leave Excel altogether by selecting **Exit** from the **File** menu or by clicking the Close button in the Excel Title bar.

All your workbooks will close one by one and you will be prompted to save any workbooks that have changed. Finally Excel itself will close down leaving you at the Desktop.

4.6 Other Ways to Start Excel

Although the usual way to start Excel is by selecting its entry from the **Start** menu, there are several other ways to start Excel, some of which you may find more convenient.

Desktop Shortcut

If you want to start Excel without navigating the **Start** menu you can set up a shortcut to Excel on your Desktop. Open the **Start** menu to reveal the entry for Excel 2000, then with the right-mouse button drag the menu entry for Excel onto your Desktop. When you release the mouse button a pop-up menu will appear, and from this you should select the entry **Copy here**. A shortcut will be created on your Desktop and you will be able to start Excel any time by double-clicking this shortcut.

My Computer or Windows Explorer

To quickly open an existing workbook in Excel you can use My Computer or Windows Explorer to locate any Excel file on your computer, then double-click the file to start Excel and load the file automatically. Once you have Excel running you can open more files by dragging icons from My Computer or Windows Explorer onto the Excel screen.

The Documents Menu

To quickly access files that you have been recently working on you can click the **Start** button and open the **Documents** menu. In here you will find a menu of your recently accessed files. Select any Excel workbook from this menu and Excel will load and automatically open the selected file.

5. Spreadsheet Tools

Typing and formatting data is all well and good but the purpose of a spreadsheet is to process your data. In this section we will introduce you to some powerful features found in Excel.

5.1 Simple Formulae

One way to process a set of numbers in your worksheet is to use a formula. Simply click on the cell in which you want the result to be displayed, then type in your formula. It should begin with the equals sign (**=**) and may contain cell references, numerical constants, or pre-defined Excel functions.

For example, to add the contents of cells **A2**, **A3**, **A4** and **A5** and put the result in **A6** you would type the following formula into cell **A6**

=A2+A3+A4+A5

Whilst you are typing it in the cell displays the actual formula, but as soon as you press the **Enter** key the contents of the cell change to show the result of the operation.

When building formulae you use the following symbols

=A1+A2	add contents of cell A1 to contents of cell A2
=A1-A2	subtract contents of cell A2 from contents of cell A1
=A1*A2	multiply contents of cell A1 with contents of cell A2
=A1/A2	divide contents of cell A1 by contents of cell A2

All formulae and functions in a worksheet process the contents of specified cells. If you decide to change the contents of a significant cell, then all formulae that refer to that cell respond immediately and automatically update their displayed result. This makes the spreadsheet an incredibly powerful tool, indispensable for answering 'What would happen if...' type questions.

5.2 Summing Numbers

To add a large range of numbers you can use the Excel **SUM** function as follows:

=SUM(A2:A5)

However, rather than typing this in you can click on the AutoSum button. Excel will place a dotted line round the numbers that it thinks you want to add. If Excel's guess is correct you can then simply click the AutoSum button again, or press the **Enter** key to confirm the range and accept the formula. If Excel guesses wrongly, however, you can simply select the correct range with the mouse and press the **Enter** key. When you are confident with AutoSum you can speed up the process by double-clicking the button.

In addition, every time you select an area of numbers, Excel will display the sum in the status bar at the bottom of the Excel screen.

5.3 Other Excel Functions

A full list of Excel functions, with instructions, is available via the function builder button. You will see a dialog box listing all of Excel's major functions. If you were to select the Average function, you would be asked to specify a range as follows.
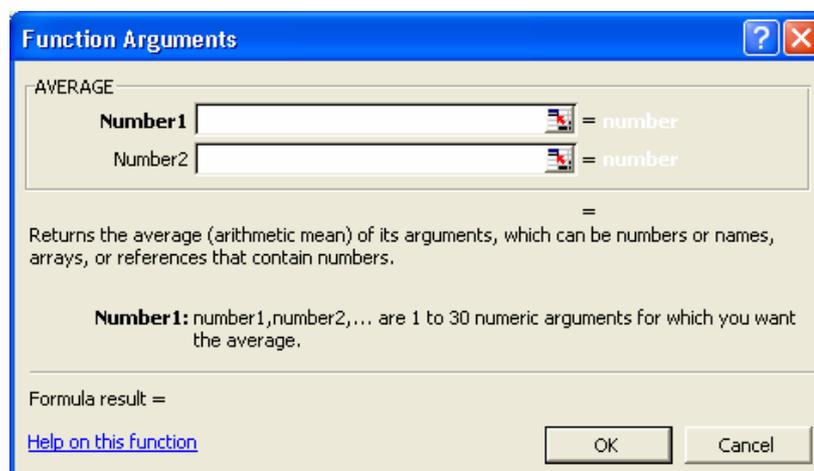
Here you can click the ▦ button to shrink the dialog box:

And you can easily select the required range of cells without the dialog box cluttering the screen.

5.4 Data-Fill

Entering data into a worksheet can be a laborious process. Excel can help you with this by making intelligent guesses as to what you intend to type in. So if you type the word 'Monday' in cell **B2**, for example, Excel can automatically insert Tuesday to Friday into cells **B3-B6**. The process by which Excel does this is called data-fill.

To use data-fill you first need to select a few cells at the beginning of a sequence. On the corner of the border of the selected cells you will notice a little box. This is called a data-fill handle. If you position the cursor above this it turns from white to black.

To extend the selected sequence you should click and hold down on the data-fill handle, then drag the border over the adjacent cells. When you release the mouse button all the selected cells will be filled in according to the sequence.

A more powerful incarnation of this feature is the automatic generation of formulae. If you have, for example, five columns of numbers and you want to sum each column, you can simply AutoSum the first column, then use data-fill to drag the formula across the other four columns. If column one has the sum of cells **A1** to **A6**, then column two would automatically perform the sum of **B1** to **B6** etc.

6. Data Validation

When you specify the type of data allowed in a cell you could also specify an allowed range of data. If a user then attempts to input invalid data into the cell Excel can display a message from you to correct them. Excel can also check the entire worksheet for invalid data. To use this feature select **Validation** from the **Data** menu.
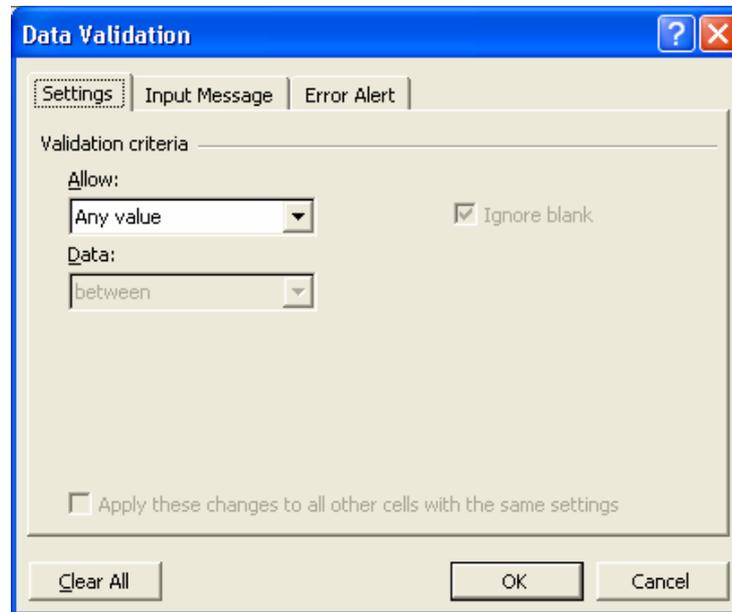
Initially cells will allow any value to be input. To change this use the **Allow** list to specify the type of number (integer, decimal, etc) and use the **Data** list to specify a range. New fields will appear in the dialog, and you can enter maximum and minimum values. You can then use the **Input Message** and **Error Alert** tabs to provide helpful message to people entering data.

You can also specify normal ranges of data such that any values that fall outside this range can be automatically formatted to bring attention to them. To use this feature select the cells in question, then choose **Conditional Formatting** from the **Format** menu.
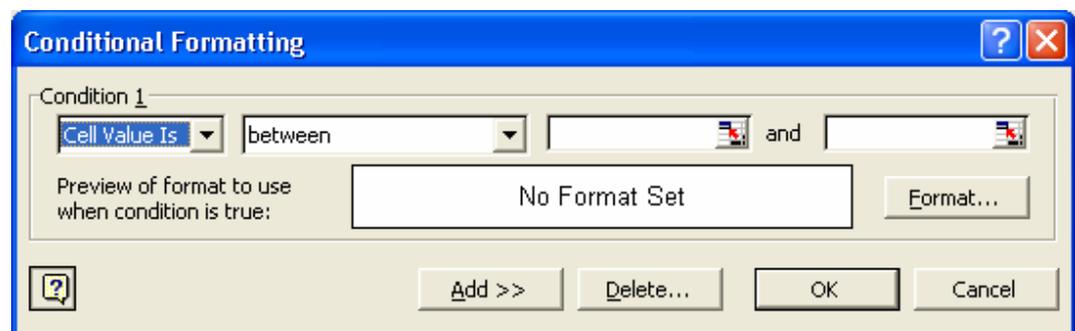
Use the fields to specify a range of data that you wish to be emphasised. Then use the **Format** button to define the formatting for this range. Click the **Add** button to set this condition, then you can either specify additional conditions, or click **OK** to return to your worksheet.

7. Restructuring Your Workbook

As your worksheet develops you may find that your original layout is not as well thought out as it could be, and you might need to make some more space somewhere.

7.1 Dragging Cells

Excel offers you many ways to reposition cells, but none more elegant than dragging a selected range to a new location, leaving Excel to deal with the relative cell referencing.

To drag a range of cells you first select a group by dragging with the mouse. Then you position the cursor on the border of the selection. If you now click and drag this selection you will see a ghostly border travel around with the mouse. When you have this in the best position simply release the mouse button and the range of cells will move as indicated.
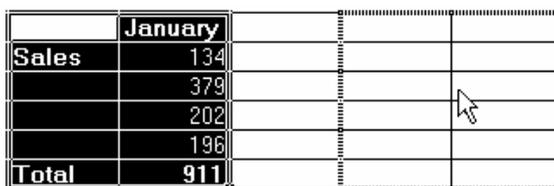
To drag selected cells to a different sheet, hold down the **Alt** key and drag the selected area onto the sheet label. Excel will then display that sheet and you can position your selected cells as normal.

Using this technique you can restructure your spreadsheet at any stage in its development.

7.2 Cut, Copy, and Paste

A more powerful method is to use the Windows clipboard. This is a temporary storage area that holds data as you move it around. You can transfer data to and from the clipboard using the **Cut**, **Copy**, and **Paste** commands, available from the **Edit** menu, the right mouse button menu, and via the buttons on the standard toolbar.

You can copy a range of cells as follows:

1. Select the range.
2. Copy the range to the clipboard.
3. Click on the cell that will be the top left corner of the range in its new location.
4. Paste the range back from the clipboard.

The range will then be copied from the clipboard to this new location. If you want to move a selection rather than copy it you use the **Cut** command rather than the **Copy** command in step 2.

Previous versions of Excel only allowed you to copy and paste one item at a time, but in Excel 2000 the clipboard can hold up to twelve items at once. So to perform radical restructuring of your workbook select the first item and click the Copy button, then select the second and click Copy. When you click Copy the second time the

Clipboard toolbar will appear, displaying an entry for each item you have placed in the Clipboard.

To paste any of these in, first hold the mouse over each entry to get a yellow label identifying each item. Then click the entry that you wish to use and it will be pasted into the workbook.

7.3 AutoFormat

AutoFormat enables you to apply pre-defined layouts to selected tables in your worksheet. These layouts don't alter the positions of your data but apply colour backgrounds and rearrange borders with nice effects.

To apply an AutoFormat select a table of data, then pull down the **Format** menu and select **AutoFormat**. You will see the following dialog box.
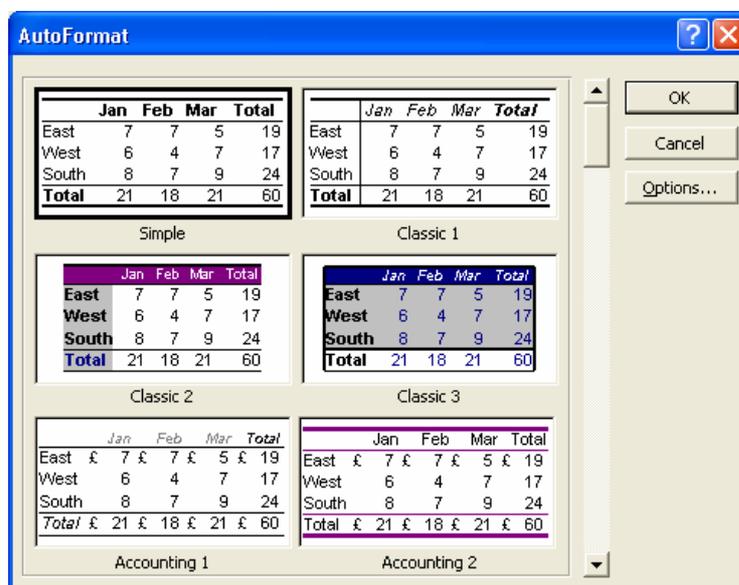
Scroll through the list of formats and when you have decided on one click on the **OK** button. Your selected table will be formatted accordingly. If you are unhappy with this new look you should pull down the **Edit** menu and select **Undo AutoFormat** to revert to the original appearance.

7.4 Non-Scrolling Headings

Often you will have a large worksheet with many, many rows that span several screenfuls. It then becomes annoying, when you are working at the lower end of the sheet, and it is not obvious which column is which. In this case you have to keep scrolling to the top of the sheet just to confirm that you are working in the correct column.

To help with this, Excel allows you to freeze part of your screen, and ensure that the frozen part of the screen always remains visible. So you can scroll down to the bottom of your worksheet, whilst still being able to see your column headings.

To do this, select the bottom row of your column headings, then from the **Window** menu select **Freeze Panes**. Now, when you scroll down your worksheet, all rows above the selected row will remain on screen, whilst the rows below your selected row will scroll as normal. You can return to normal scrolling behaviour at any time by selecting **Unfreeze Panes** from the **Window** menu.

You can also freeze row headings in the same way by selecting any column and freezing the pane.

8. Graphs and Charts

Having built your worksheet you should have generated some meaningful results. The best way to display these results is use Excel's powerful graphing facility. Excel documentation uses the word chart to refer to any kind of graph so we will follow suit.

To generate your own chart you should first select the cells that contain the results that you want to plot, then click on the chart wizard button. You will then be presented with a succession of dialog boxes asking you for information.
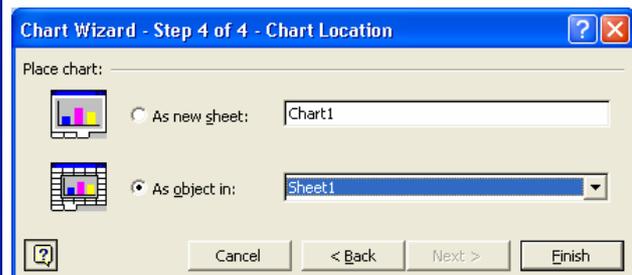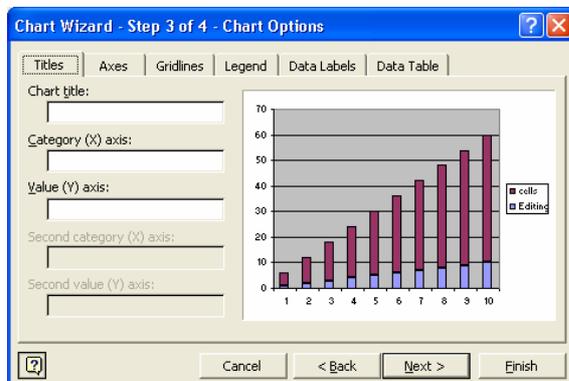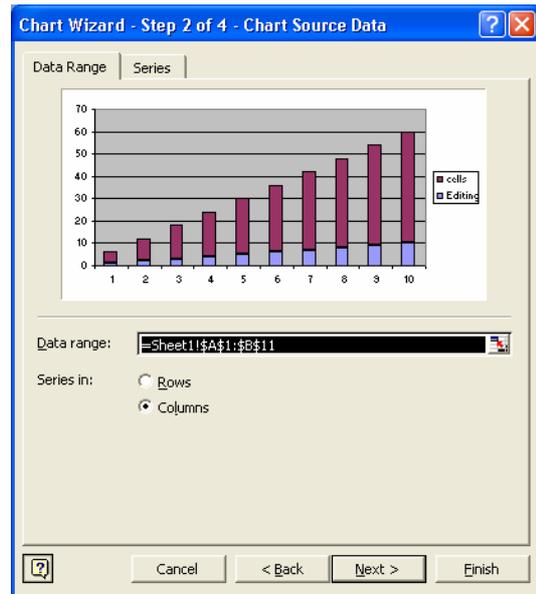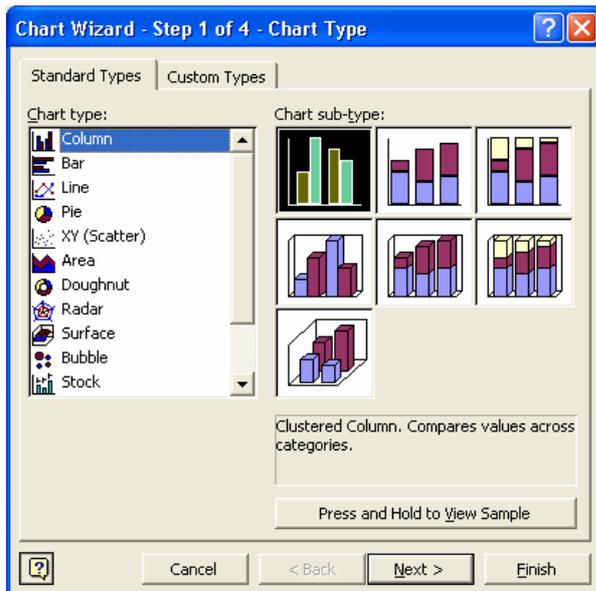
Choose from the options as appropriate then click the **Finish** button on the final dialog box. A chart will be added to your workbook.

Whenever your chart is selected, by a single-click, a **Chart** menu appears. This contains all the options that were set in the Wizard, so it is very easy to amend a chart. Whenever a chart is selected, its underlying data tables become outlined for easy reference.

9. Printing from Excel

The final task after generating your results and creating a chart is to print out your worksheet on a laser printer. If you are only interested in certain extracts from your workbook you can copy these to a new worksheet specifically for printing.

9.1 Print Preview

Next you can take a look how your worksheet will appear on A4 paper. To do this you should pull down the **File** menu and select **Print Preview**.
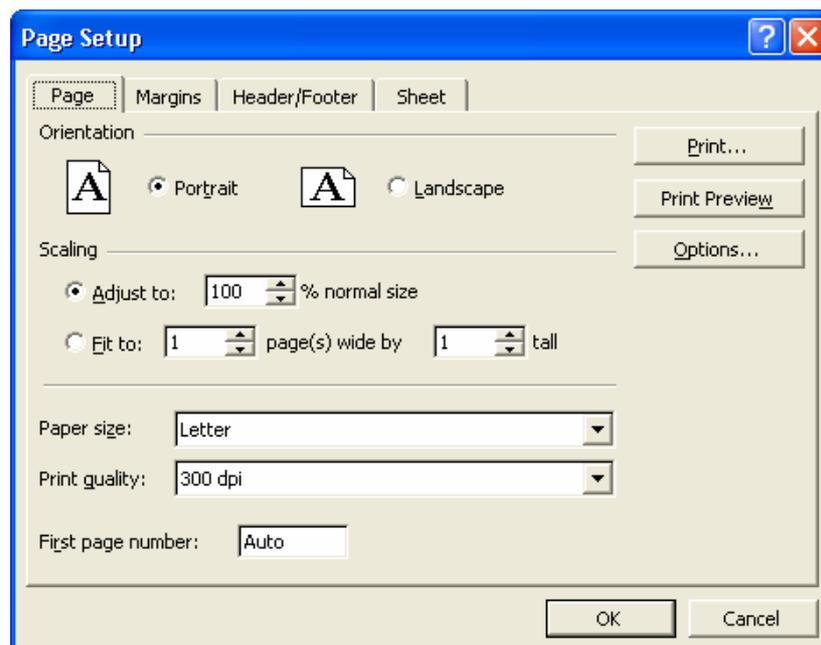
You will see a representation of each page and will be able to get an impression of the overall layout. To fine tune your printout, click the Setup button. You will see a dialog box with four tabs that allow you to change the appearance of your printed pages.

If you want to prevent the worksheet gridlines from appearing on your printout click on the **Sheet** tag and remove the check from the **Gridlines** option in the **Print** box. When you have done this click on the **OK** button to return to the preview screen.

If you like what you see you can now press the **Print** button, otherwise press the **Close** button and reorganise your worksheet accordingly.

9.2 Printing

When the preview looks good you can finally send your worksheet to the printer. Either press the **Print** button from the Preview screen, or pull down the **File** menu and select the **Print** option.

When you see the dialog box simply click on the **OK** button and your sheet will be printed on the specified laser printer.

10. Putting Excel Objects into Word Documents

Any data table or chart produced in Excel can be placed in a Word document.

The easiest way to do this is to select the data or chart in Excel, then click the Copy button. Then start Word and place the insertion point wherever you want the Excel object to appear. Finally click the Paste button in Word.

If you had selected a table of data then this will appear in Word as a standard Word table, and you can adjust column widths and format cells as usual. If you had selected a chart then this will appear in Word as a graphic.

If you later needed to edit your chart you can simply double click the chart within Word. All the Excel menus and toolbars will then be displayed within Word itself and you can make any changes as if using Excel.

This is a very powerful feature that is easy to use; the disadvantage, however, is that if you do edit your data or chart in Word, you may end up with two differing versions, one in Word, one in Excel. A more elegant way to place Excel objects in a Word document is to select and copy the object in Excel, as before, then start Word and from the **Edit** menu select **Paste Special** to get the following dialog box.
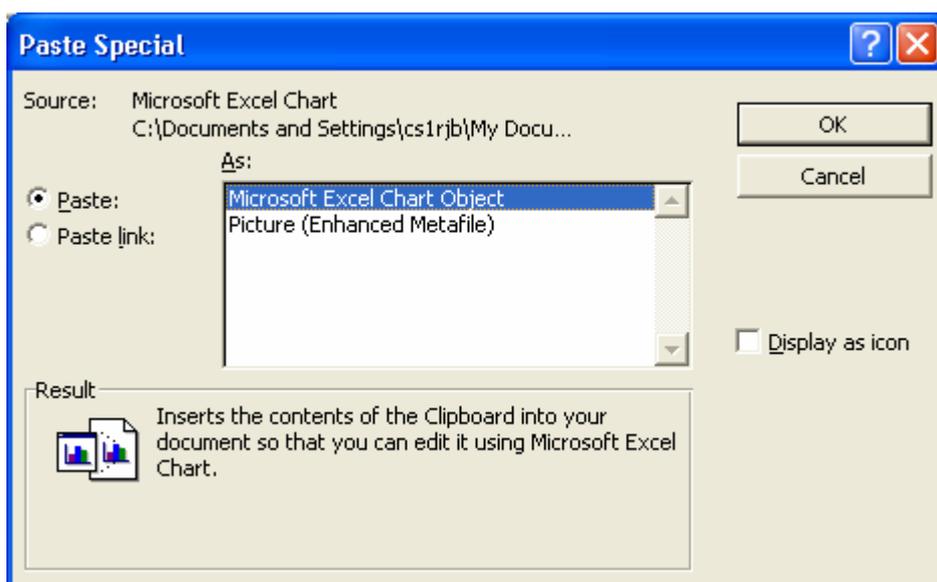
If you now choose the **Paste link** option then Word will add a link to the Excel workbook. This means that whenever you open this Word document it accesses the Excel file and loads the data or chart. In this way there is only ever one version of the data, and the Excel workbook and Word document will always be consistent with one another.