Quick Start with Microsoft Excel 2003

Doc 5.114 Ver 1
Date Jul 2004

Author Vivien Hall
Central Computing Services

Abstract

This document introduces the *Microsoft Excel 2003* spreadsheet package. It aims to provide a quick start for new users. For more information on *Microsoft Excel 2003* please refer to 'Software made Simple Guide to *Microsoft Excel 2003*'. Copies of the Guide are available to students and staff of Birkbeck either in paper form from CCS Help Desk, MB 151 or from the College Intranet at http://intra.bbk.ac.uk/ccs/docs/sms/. Help Desk is open on weekdays 10.00am - 8.00pm in term time, and in vacations it is open on weekdays 10.00am - 6.00pm.

Prerequisites

These notes assume that you are familiar with using a mouse and keyboard and a *Windows* desktop and that you can log in to CCS workstations and use a web browser. You should also be familiar with using on-line Help for Windows. If you are not familiar with these topics please refer to CCS document 3.38 'Getting Started on CCS Workstations'

Contents

About this Document

➢ Section numbers in brackets refer to section numbers in *Software Made Simple – a Guide to Excel 2003* e.g. (SMS section 2.4).

➢ Words that you type or choose are in **bold type,** e.g. Choose **Programs** from the **Start** menu.

➢ Keys that you press are shown in small capitals e.g. press ALT.

➢ Press KEY1 + KEY2 means press both keys together e.g. press CTRL + Z

➢ Press KEY1, KEY2 means press each key consecutively e.g. press A, B.

➢ Exercises for you to practice as you work through the notes are labelled **Exercise**, e.g. **Exercise 1 Importing Database Objects.** The steps that you do to complete the exercise are marked by round bullets (•).

➢ Hints and tips are indicated by ☞ If you are not very familiar with using computers then you should pay particular attention to the hints and tips. Even if you are fairly familiar with using a computer you should read them, as they can provide explanations of why you do something, or they may suggest an alternative way of doing things.

1 Introduction

The aim of this workshop is provide the basic information on Excel so that by the end of the session you should be able to:
➢ enter data into the spreadsheet
➢ use it to calculate mean values
➢ plot two simple graphs using Excel.

Microsoft Excel 2003 has many powerful features for handling numeric problems. This workshop is to get you started using *Microsoft Excel 2003* and will not attempt to cover the complex mathematics required to make full use of all the functions. However, each function is explained in the online help, so once you have learnt the basic skills you should be able to find out about your own particular interests.

Microsoft Excel 2003 is a *spreadsheet* program. A spreadsheet is a powerful application for handling data, mostly numeric data. It is rather like an electronic ledger, which provides a method by which data can be analysed and used in complex calculations. However, do not worry – *Microsoft Excel 2003* performs the calculations for you.

2 Getting Started

2.1 Logging in

If you are attending a class at Birkbeck in a CCS workstation room then you will need to log in. If you are using your own computer then you should start the computer in the usual way and skip Exercise 1.

You will need a username and password for access to Birkbeck Academic networked Workstations. If you are attending a workshop and your username and password are not available then the session leader will lend you one for the duration of the session.

Exercise 1 Log in to a CCS workstation

- At the *Windows* log in prompt, type your username in the 'Username' box.
- Press the TAB key to move to the 'Password' box, and type your password. Then press the Enter key or click on **O.K.** Wait a few seconds while *Windows* checks your username and password, and allocates your network resources.

2.2   Downloading the sample data

To save time a sample file **birds.xls** has been created for you and saved on a CCS Web page. You can download and save it using a web browser. In the next exercise we'll use *Internet Explorer* but if you prefer to use another browser you should follow the instructions given with your browser. If you are using a CCS workstation then you should save your file in **N:\My Documents**. Otherwise you should save it to the location that you normally use for saving files.

Exercise 2 Download and save the file

- Start the *Internet Explorer*. You can click on the *Internet Explorer* icon on the task bar at the bottom of the screen or *double* click on the icon on the desk top.
- Click in the box at the top of the screen labelled **Address** and type the **URL** (web address)
  http://www.bbk.ac.uk/ccs/docs/samples/birds.xls
- When the **File Download** box appears (Figure 1) click on **Save**
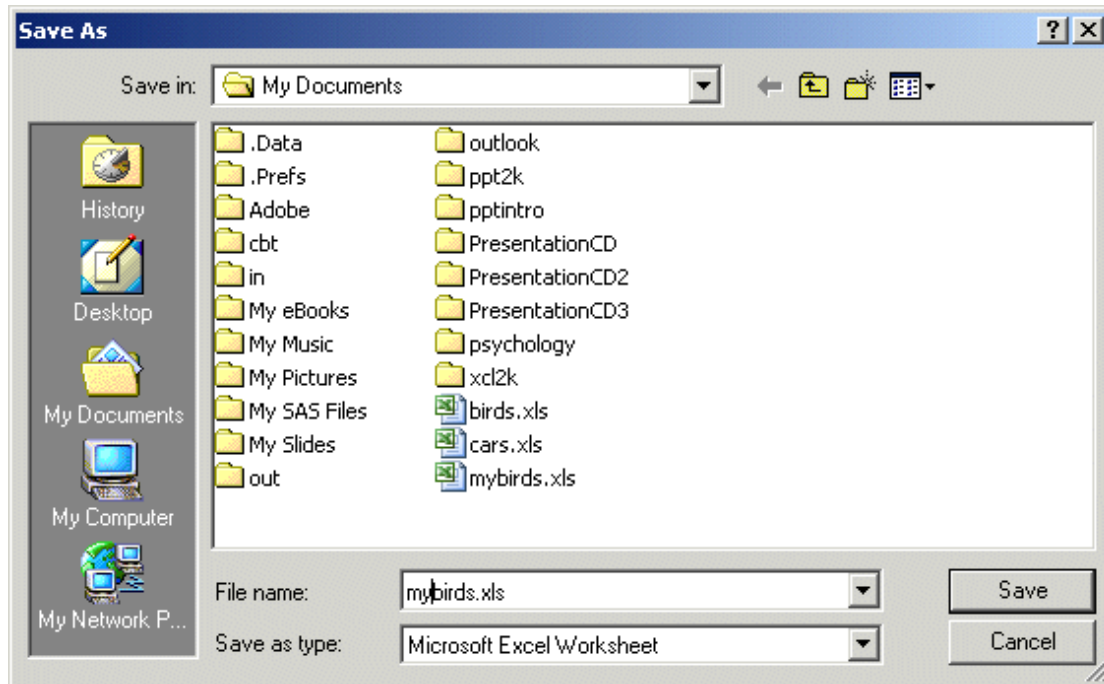
Figure 1 Save a downloaded file
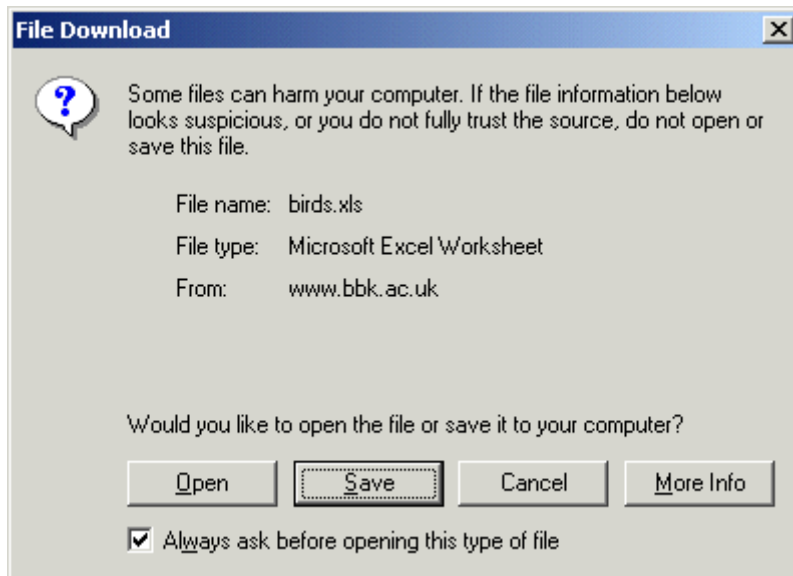
- On CCS workstations make sure that you're **My Documents** folder is selected (Figure 2). Click on the **My Documents** icon if it is not. Otherwise select the location where you want to save the file.

Figure 2 My Documents

- Type the name of the file **mybirds.xls** in the box labelled **File Name.** Note that there is no space in the filename. Although most *Windows* systems will accept spaces it is best to avoid them as some computer systems do not recognise them.
- Click on the button labelled **Save**.

2.3   Starting Excel

Exercise 3 Starting Excel

- Click on the **Start** button on the *taskbar* at the bottom of the screen. The *Start Menu* will appear.
- Click on *Excel 2003* in the *Microsoft Office 2003* group on the *Start Menu*. *Excel 2003* will then start. If the Adobe Acrobat tool bar appears you may wish to hide it by clicking on the close button (Figure 3)
- From the **file** menu chose **Open** and open your file **mybirds.xls** On CCS student workstations *Excel* should look in **N:\My Documents** first. Otherwise you will have to browse for your file

The Excel window is shown in Figure 3 (see next page). You may like to bookmark this diagram for future reference. If you have used *Microsoft Word for Windows* you will see many similarities between the applications, for example, some of the menus and toolbar buttons will be familiar.

The *Microsoft Excel 2003* document is called a *workbook.* Each *workbook* consists of a number of *worksheets*. Each *worksheet* consists of a number of *columns* and *rows* of *cells*. The *columns* are identified by letters and the rows by *numbers*. Therefore any *cell* within the grid can be identified from its co-ordinates. For example the third cell down in the second column would be B3. This is called the <u>cell reference.</u>

Figure 3 Excel Window
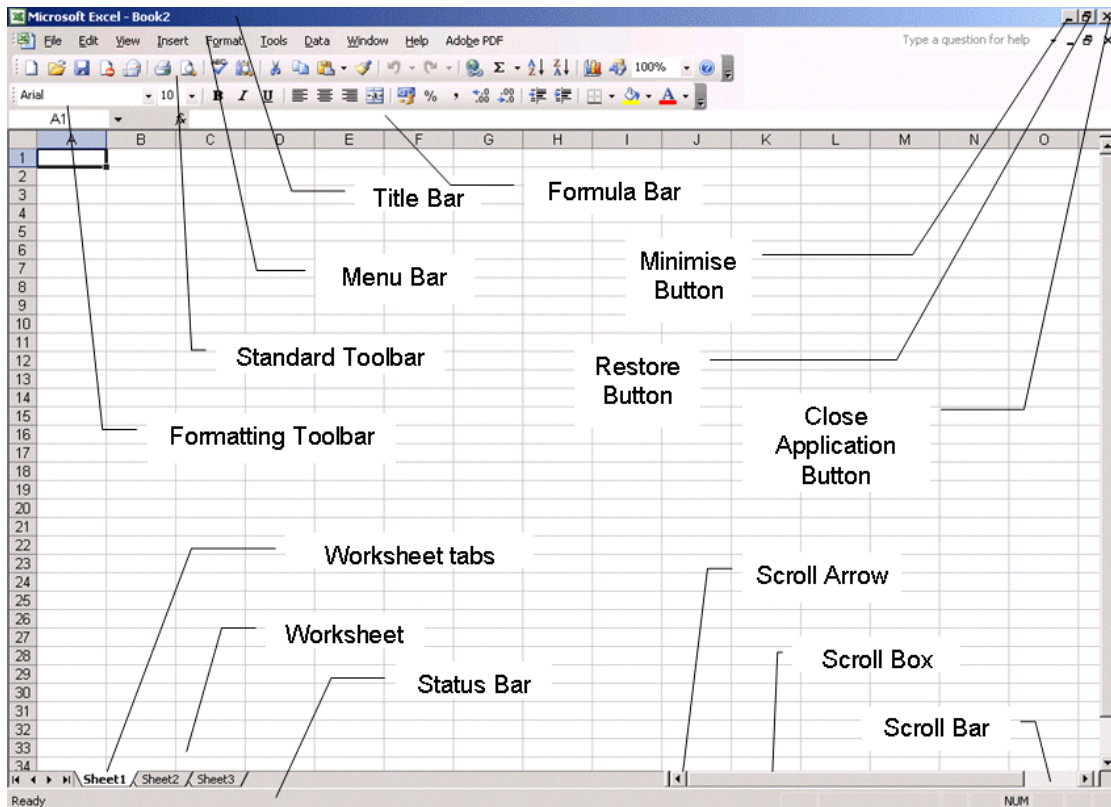
3 Data Entry

3.1 Entering Data

Cell addresses are identified by the column letter and row number
e.g. **A1**. Ranges of cells are separated by a colon (**:**) – e.g. **B2:C5** is
a block of cells.

Magpie
4
3
4
5
3
3
4
5
5
4
4
3
4
5
4
3
5
5
7
6
5
6
5
6
8
6
6
8
7
6
6

Exercise 4 Entering Data

- Select the cell **D1** by clicking in it once and type **Magpies.**
- Enter the data into the cell by pressing the Enter key.
- Type the following list of numbers shown right in cells **D2** in cells
  D2 through **D32**, pressing the enter key after each number to
  move to the cell below.

If you find that you have left out a row or column when entering your
data you can insert new rows and columns.

3.2 Inserting rows and columns

Exercise 5 Insert a column

- Click at the top of column **A**.
- From the **Insert** menu choose **Columns**.

A new column is inserted labelled **A** and the old columns **A, B**, etc.
are renamed **B, C** etc.

3.3 Autofill

You can speed up data entry by using a feature called *Autofill*,
sometimes called *Autocomplete. Microsoft Excel 2003* can calculate
data series such as dates, numeric series, days of the week.

Exercise 6 Autofill data

- Select cell **A1** and type **Date** then enter the data into the cell (by
  pressing the enter key)
- Select cell **A2** and type **01/10/2004** then enter the data into the cell.
- Click in cell **A2** to re-select it, then move the mouse pointer to the bottom
  right corner of the cell until it turns to a *fill handle* (see below).
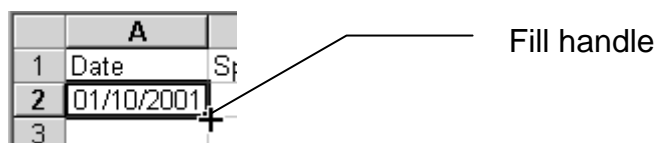
Fill handle

- Drag the fill handle down and you will see a series of dates appearing.
  Drag the fill handle until you have completed the series from **01/10/2004** to
  31/10/2004 (do not worry if you cannot complete it all in one drag, you can
  drag the last value as many times as you need).

3.4 Changing Column widths

Sometimes your data will not fit into a cell. If a number is too wide for the cell it appears as hash signs **####**. Text will appear to overlap into the next cell. Sometimes it will be sufficient just to adjust the column width by dragging the column headers to left or right. To do this

➢ Move the mouse pointer to the edge of the column header (labelled **A, B** etc.) that you want to move. The pointer will change to ←I→

➢ Hold down the left mouse button and drag the column headers to the size that you want.

4 Functions and Formulae

4.1 What is a formula?

A formula is a sequence of values, *cell references*, *functions*, or *operators* that are entered into a cell to produce a new value. A formula always starts with an = sign.

➢ Values have already been introduced – in exercise Exercise 4 you entered the observed values for the number of magpies. Values are numeric data, for example measured values from an experiment, observed values, amounts of money. In survey analysis the replies are usually coded to have a value. For example in CCS workshop evaluations we rate a workshop with a score of 5 for 'very useful' through to 1 for 'not much use'

➢ *Operators* are symbols such as arithmetic and logical symbols that you use to combine values. The most commonly used operators are the *arithmetic operators* are

+	Add
-	Subtract
*	Multiply
/	Divide

➢ When you need to build a formula for yourself you can find a full list of operators in the *Microsoft Excel 2003* online help index. You need to be aware of the order in which Microsoft Excel performs operations in formulas, known as the order of precedence of operators. Again this information is available to you on-line through the online help index.

➢ To get help
  o Click on the **?** symbol on the toolbar
  o Type the search term in the **Search for** box. (for example 'arithmetic operators')
  o Click on the arrow to the right of the box
  o From the list of results click on the one that looks most useful (For example 'About calculation operators'

➢ We will consider *functions* and *cell references* in the following sections.

4.2 What is a function?

Functions are predefined formulas that perform calculations by using specific values, called *arguments*, in a particular order, or structure. For example, the SUM function adds values or ranges of cells.

Arguments can be numbers, text, logical values such as TRUE or FALSE, arrays, error values such as #N/A, or cell references. The argument you designate must produce a valid value for that argument. Arguments can also be constants, formulas, or other functions.

The syntax of a function begins with the function name, followed by an opening parenthesis, the arguments for the function separated by commas, and a closing parenthesis. If the function starts a formula, type an equal sign (=) before the function name.

You can enter a function into a cell either by typing the function into the cell or by using the *autosum* button (see right) on the tool bar. Click on the dropdown arrow on the right of the button to see a menu of other commonly used functions.

In the following examples we will look at two common functions SUM and AVERAGE (or mean value). *Microsoft Excel 2003* also provides online help for many other functions.

☞ *You can stop the Office Assistant appearing when you choose Microsoft Excel Help from the Help menu. When the OA appears, click on options, clear the checkbox labelled* **Use Office Assistant** *is clear, and click on* **O.K**

4.3   Calculate the total for first row of data

☞ *If you cannot see any of the toolbar buttons referred to in this document choose toolbars from the view menu. There should be a tick mark next to standard and formatting toolbars. If there is not click on the toolbar to switch it on.*

☞ *If you hold the mouse button over a toolbar button (do not click) a yellow label drops down to tell you the function of the button. This is called 'hoverhelp'*

<center>**Exercise 7 Total data in a row**</center>

- Enter the column title **Totals** in cell **F1**
- Select cell **F2**
- Click on the **autosum** button on the toolbar. As you have a series of numbers in cells B2:E2 *Microsoft Excel 2003* works out that this is what you want to sum, and places the formula in cell F2 (see below).

	A	B	C	D	E	F
1	Date	Sparrow	Robin	Pigeon	Magpie	
2	01/10/01	14	2	3	4	=SUM(B2:E2)

- Enter the formula into the cell by pressing the **Enter** key

☞ *So far you have terminated edits by pressing the* Enter *Key. However there is an alternative technique. If you reselect cell **F2** you will see the formula that you have just entered. You can edit a formula by clicking in the formula bar and typing the new formula. You can use the cursor keys to move left and right and the backspace and delete keys to delete characters. As an alternative to entering the data in the cell by pressing the* Enter *key you can enter the data by clicking on the tick mark next to the formula.*

4.4   Use autofill to copy the formula down column

As well as using Autofill to copy data in a series you can use it to copy formulae. If you cannot remember how to do this please refer back to Exercise 6.

Exercise 8 Autofill a function

- Use the autofill handle to copy the formula in cell **F2** into cells **F3:F32**

You should see that *Microsoft Excel 2003* has incremented the row number – so cell **F3** contains the formula **=SUM(B3:E3)** etc.

4.5   Calculate A Total

As well as using Autosum to sum rows you can use it to sum columns. If you cannot remember how to do this please refer back to Exercise 7.

Exercise 9 Autosum a column

- Use the Autosum button to calculate the total number of birds seen in the month in cell **F33**

4.6   Calculate a Mean

We will use the *Function Menu* that you can access from the *autosum* button to calculate the **AVERAGE** (or MEAN) number of birds that appear each day.

Exercise 10 Calculate A Mean

- Select cell **B33** and click on the drop down arrow on the right of the *autosum* button on the toolbar
- A function wizard menu appears, where you can select some of the more common functions from a menu. (see right).
- Select **Average** from the menu.
- Note that *Microsoft Excel 2003* has put the formula **=Average(B2:B32)** in already (see right). However, this is not the formula that we want, as column **B** contains the number of sparrows each day. We want to calculate the mean of the *total* number, which is in column **F**. Click in the formula bar and replace the formula in
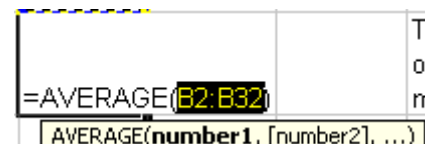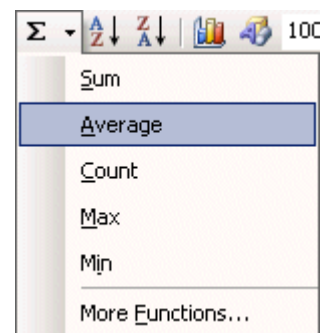
the box by the range **F2:F32** and press the **Enter** key.
If the function that you need is not on the drop down menu then you can
select **More Functions** from the drop down list. The **Insert Function** box
appears (Figure 4)

Figure 4 Choose a function
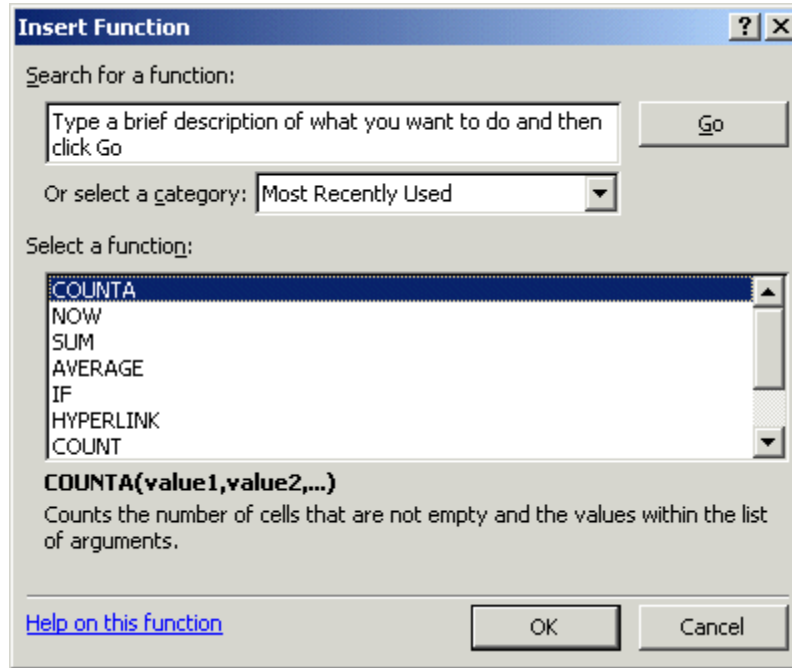
When you have chosen the function that you need *Microsoft Excel 2003* will
ask you for the arguments. You can type in a cell range or select it by
dragging the mouse pointer over the range of cells on your spread sheet.

Figure 5 Choose Arguments
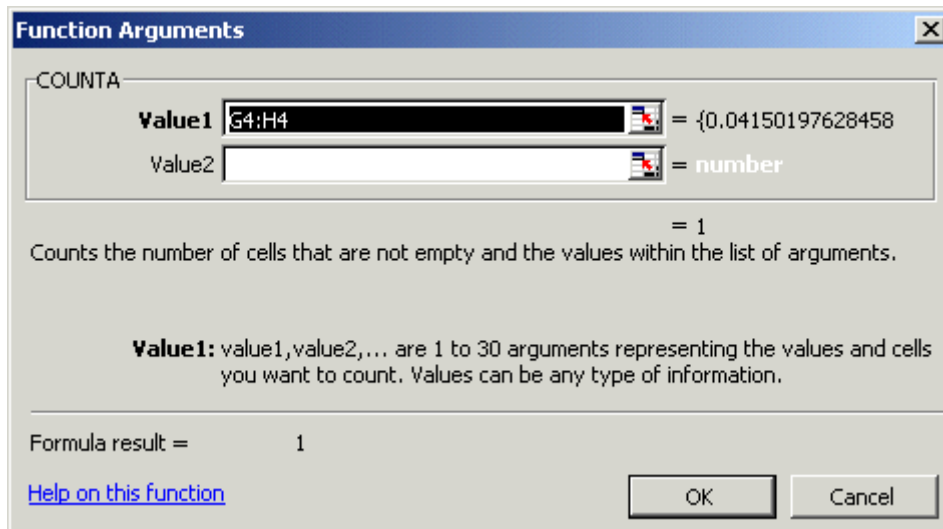
4.7   Relative and Absolute References

In Exercise 8 you used *relative cell references*, which are references to cells relative to the position of the formula. However, for some tasks you will need to use absolute references, which are cell references that always refer to cells in a specific location. For example, if we want to calculate the percentage of the monthly total of birds that appear each day we need to divide the daily total by the calculated monthly total. To calculate percentages in column **G** we divide each of the values in column **F** by the total value in **F33** to get the daily percentage. If we do as we did in Exercise 7 and Exercise 8, i.e. calculate the first value in cell **G2** & then autofill the column, we will not get the correct result. **F33** is a *relative address* and will change to **F34** etc. We need to specify that the row number is an *absolute address* by putting a dollar sign in front of the row number i.e. **F$33**

☞*If a dollar sign precedes the letter and/or number, such as $A$1, the column and/or row reference is absolute.*

☞ *Relative references automatically adjust when you copy them, and absolute references do not.*

Exercise 11 Absolute addresses

- Enter the column title **Monthly %** in cell **G1**
- Enter the formula **=F2/F$33** in cell **G2**
- Use autofill to copy the formula into cells **G3** through **G32**
- Select the data that you have just entered in cells **G2:G32** then click the **%** button (see right) on the tool bar to format as percentages. (If you cannot see the button on the toolbar click **>>** to see more)

4.8   Labelling your calculations

We calculated the total number of birds in the month, putting the result in cell F33. However, another person reading the spreadsheet would not know what this figure was so we will put a label next to the cell to tell others (and remind ourselves). We will use the *wrap text* feature to fit the label into the cell width.

Exercise 12 Add and format a label

- Enter the text data **Total No of birds in month** into cell **E33**. The text string is too long to fit the cell.
- Reselect cell **E33** and choose **Cells** from the **Format** menu.
- In the **Format Cells** dialogue box select the **Alignment** tab by clicking on it.
- Put a tick (also called a *checkmark*) in the box labelled **wrap text**
- Close the dialogue box by clicking on the **O.K** button.

5 Drawing a graph

There are many functions associated with *Microsoft Excel 2003* to help you draw graphs. In this session you will only do some very basic work. You should take time to work with this powerful software and explore what you can actually do with it. It will stand you in good stead in the future.

You will use ***chart wizard*** to draw graphs of your data. It is fairly straightforward and all you have to do is follow the instructions. You will find it easiest if you highlight the data you want to graph before you start.

5.1 Creating a chart

➢ Select the data that you want to plot. To do this highlight the cells containing the numbers you want to plot. If the rows or columns that you want to select are not adjacent then select the first row or column, hold down the Ctrl key and select the other rows or columns.

➢ Start the **chart wizard**. To do this *either* left click on the *chart wizard* button on the toolbar (see right) *or* left click on **insert** and then **chart** on the pulldown menu.

➢ This will start a series of dialogue boxes. The first is called:
Step 1 of 4 Chart Type
The first box should open on one labelled **standard types**. If it does not, click on the **tab** at the top labelled **standard types**.
You will see a list of graph types. Choose a **chart type** from the list, and then choose a **sub-type**. You can view a description of the sub-types by selecting the subtype. You can preview how your graph will appear by clicking on the button labelled **Press and Hold.** When you have selected the chart type click **next** at the bottom of the dialogue box.

➢ This takes you to **Step 2 of 4 Chart Source Data.** You should see a picture of your graph in the next dialogue box and the data range filled in the box beneath the picture. If you did not highlight your data, there will be no information in the data range box and you need to fill this in. The easiest way to do this is to click on the button at the right end of the box (the one with the red arrow) to move back to the data sheet. You can then highlight the data you want to plot. Click on the datasheet button (the one with the red arrow) to return to the dialogue box. The software should also have automatically detected whether your data is in rows or columns. The selected option will be indicated by a ● If it has got it wrong - click in the appropriate circle. Then click on **next** to move to the next dialogue box.

➢ This is **Step 3 of 4 Chart Options**. This is where you make your graph look pretty. It normally opens with **titles** tab at the front. Here you can enter the title for your graph and the labels for you axes. Do not forget the units. Some options:
　　Click the **gridlines** tab and you can add or remove gridlines.
　　Click the **legend** tab then you can position the legend or remove it completely. You do not need a legend in this session.
　Once you have finished, click on **next**, this will take you to the final screen.

➢ **Step 4 of 4 Chart Location** In this box - the program wants to know if you want the graph in the worksheet or on a separate page. Personally I find it easier to put them on a separate page so normally I click 'on separate sheet'. Finally click **finish** and your graph should be created.

5.2   Changing the graph

☞ ***Object*** *is the term used by Microsoft to describe the various parts of your graph, e.g. the background, the axis, the data series. You may come across this term when referring to on-line help or reference documents.*

☞ *You can find out what an object is called by moving the mouse pointer over the object (do not click). A small yellow label will drop down, showing a description of the object.*

☞ *Sometimes you need to select an object that is part of another object. For example, you may want to select a data point that is part of a data series. The first click selects the data series. A slight pause (to avoid double click) and another click and you select a data point.*

If you want to change any aspect of the graph all you need do is to select the *object* that you want to change. To do this:
➢ *Either* double click on the object you want to change - e.g. an axis *or* the background of the chart
➢ *Or* right click on the object. This will give you a pull down menu that gives you a further list of options.

5.3   Changing the background

I prefer clear backgrounds to my graphs and, as you will find, the default is grey. You can change this by selecting the *background object* and double clicking on the background of the graph. A **format plot area** dialogue box opens. You can change the borders to **none** and the area to **none**.

5.4   Formatting the Axes

When using a black and white printer it is better to format the axes in patterns because it helps to make different series stand out when you have more than one series of Y values. To format the axes you must first select the *axis object* then use either right click or double click to bring up the dialogue boxes.

5.5   To move bars together

The bars on a histogram should be adjacent. If they are not, right click on one of the bars. A menu appears containing the option **format data series**. Left click on this and a dialogue box opens. Select the **options** tab and change the gap width to 0. You can set numeric values either by typing the number directly or by scrolling through the box using the scroll arrows. Click on **OK** to return to the graph. The bars should move together.

5.6   Histograms

A *histogram* is called a *column chart* in *Microsoft Excel 2003*. It shows data changes over a period of time or illustrates comparisons among items. Categories are organized horizontally, values vertically, to emphasize variation over time. We will plot a histogram that shows how the total number of birds varies throughout the month.

Exercise 13 Plot a histogram

- Select cells **A1:A32**.
- Hold down the Ctrl key and select cells **F1:F32**.
- Start the **Chart Wizard**
- In Step 1 of 4 choose chart type **Column** then choose sub-type **Clustered Column**. Click on **Next>**
- In Step 2 of 4 check that you have selected the correct data range, which should appear as **=Sheet1!$A$1:$A$32,Sheet1!$F$1:$F$32**. Note the use of **$** to indicate absolute addresses and the **Sheet1!** Qualifier to say that the data is on sheet 1. Check that *Microsoft Excel 2003* has correctly worked out that the data is in columns. Click on **Next>**.
- In Step 3 of 4 set the title to **Birds in October**. Label your **X** axis as **Date** and your **Y** axis as **Total No of Birds**. Clear the legend by clicking on the **legend** tab and clearing the **show legend** box. Click on **Next>**
- In Step 4 of 4 choose **As New Sheet** and type the name **OctoberTotals** in the box next to it. Click on **Finish**

You should now have a chart to format. In the next exercise you will select objects and format your chart. We will practice using both the double click and right click techniques to select objects so that you can see which you prefer. However, if you find double click difficult you can use right click.

Exercise 14 Format a chart

- *Double* click on the background (called the *Plot Area* in *Microsoft Excel 2003*). In the dialogue box choose a white backgound and click on **OK**
- *Right* click on the data series and choose **Format Data Series** from the pop up menu. Make sure the **Patterns** tab is selected. Click on the **Fill Effects** and choose a suitable fill effect, foreground and background colours. Click on **OK** to return to the **Format Data Series** dialogue.
- In the **Format Data Series** dialogue box click on the **Options** Tab and set the **Gap Width** to **0** Click on **OK.**

Your graph should now look something like Figure 6

Figure 6 Histogram of Totals
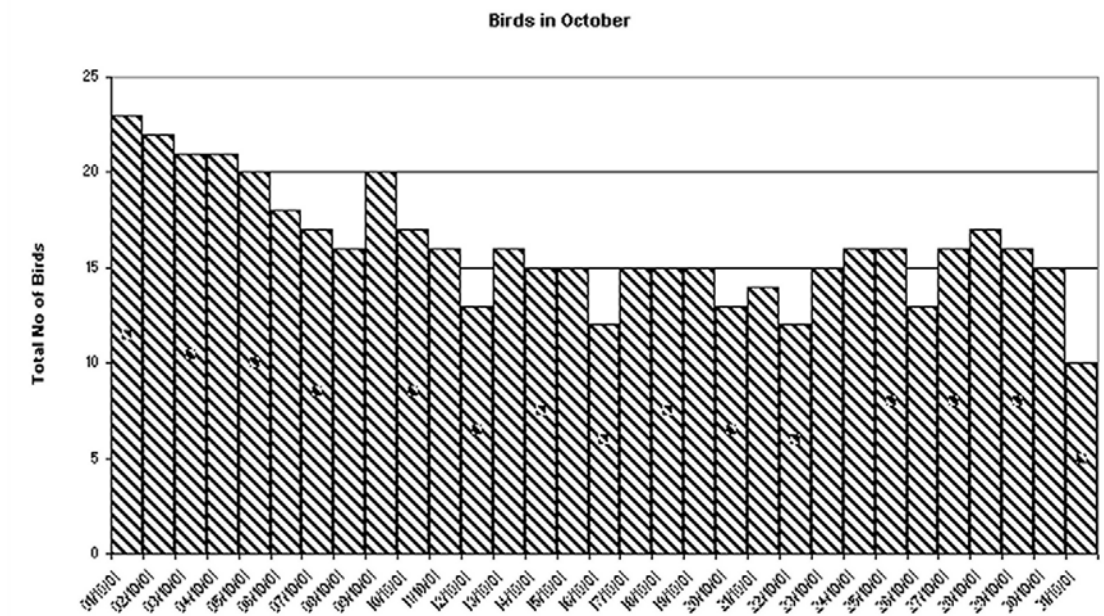
5.7   Scatter graphs

An *xy (scatter)* chart either shows the relationships among the numeric values in several data series or plots two groups of numbers as one series of xy coordinates. This chart can be used for uneven intervals — or clusters — of data and is commonly used for scientific data. One of the most common things used on the x axis is time, for example readings taken at intervals which may or may not be regular.

When you arrange your data, place x values in one row or column, and then enter corresponding y values in the adjacent rows or columns.

In the next exercise we will draw a scatter chart to show how the number of birds of different species varies throughout the month.

In the previous exercise you only plotted one series (the totals) so there was no need for a legend to identify what the series meant. However, in the next example you will need the legend to distinguish between the different series.

Exercise 15 Draw a scatter chart

- Click on **Sheet1** to go back to your data sheet.
- Select the data in cells **A1:E32**. Note that because the data is in adjacent columns that you do not need to hold down the Ctrl key when selecting the data.
- Start the *Chart Wizard*
- In Step 1 of 4 choose chart type **XY (Scatter)** and choose the first subtype
- In Step 3 of 4 give your chart the title **Bird Species** and label the X axis with **Date** and the Y axis with **No of birds**
- In Step 4 of 4 save your chart as a **New Sheet** called **SpeciesChart**

6 Saving your work

Do not forget to save your file when you have finished. If you need to copy your files to a floppy disk we recommend that you proceed as follows:

- ➢ Save it to your **N:\My Documents** folder
- ➢ Close the file
- ➢ Go to *Windows Explorer* and select the file in your **N:\My Documents** folder
- ➢ Right click on the file, then select **Send To** from the popup menu.
- ➢ Select **3.5" floppy**
- ➢ Make sure that the light on the floppy disk drive is not active before you remove the disk from the drive.