Introduction to Microsoft Excel

Spreadsheet packages such as Microsoft Excel are essentially used to store and manipulate sets of figures. They use a format that is similar to that of an accounting worksheet (i.e. a row and column arrangement) with individual 'cells' normally being identified by a column letter and a row number (e.g. B3 refers to the cell at the intersection of the second column and the third row).

Each cell of a spreadsheet may contain text, a number or an expression to perform a calculation. There are over four million cells in Microsoft Excel worksheets thus providing an extremely powerful structure for building complex models.

Spreadsheet systems normally include facilities for:

- Editing the content and arrangement of the data
- Storage and retrieval of worksheets
- Printing
- Graphical presentation of data
- Access to predefined statistical and mathematical functions.

The following sections will provide practice in using some of these facilities through the development of a typical business model.

## Starting Excel

To start Excel, select *Excel* from the *Microsoft Office* menu item

Moving around the spreadsheet

Spreadsheets generally use a rectangular 'box' around the active cell. This must be positioned at the cell in which you wish to make an entry. You can navigate to your required cell by either using the arrow keys on your keyboard, or by pointing and clicking with the mouse cursor, where an entry can then be made.

The following keys are normally used for standard navigation:

Cursor keys can be used to move the active cell up, down left or right: ↑ ↓ ← →

`Page Down` and `Page Up` keys move down and up one page (i.e. screen)

The `Alt` key with `Page Down` `Page Up` or can be used to move to the next screen right or left.

`Ctrl` with `Home` takes you to the top left-hand cell (i.e. A1)

`Esc` is the 'Escape' key which can often be used to cancel an operation.

Developing a Model

One of the popular uses of a spreadsheet is to forecast cash flow problems. The following sections will show how to create a basic cash-flow model and in doing so, will introduce the main techniques and operations needed for setting up and manipulating any new worksheet.

Data Entry

The spreadsheet recognises an entry placed in a cell as either a '**label**' (i.e. text), '**Value**' (i.e. Number) or '**Formula**' (i.e. calculation). As we type, text appears in the edit line above the cell area, and in the cell itself. To finish entering the data, we press the **Enter** key ↵ .

If any mistakes are made after pressing the **Enter** key , simply retyping the entry will 'overwrite' the current cell content, or pressing the '**Delete**' key will remove the entry.

Activity 1: Enter the following labels and values on a blank spreadsheet:

Entering Calculations
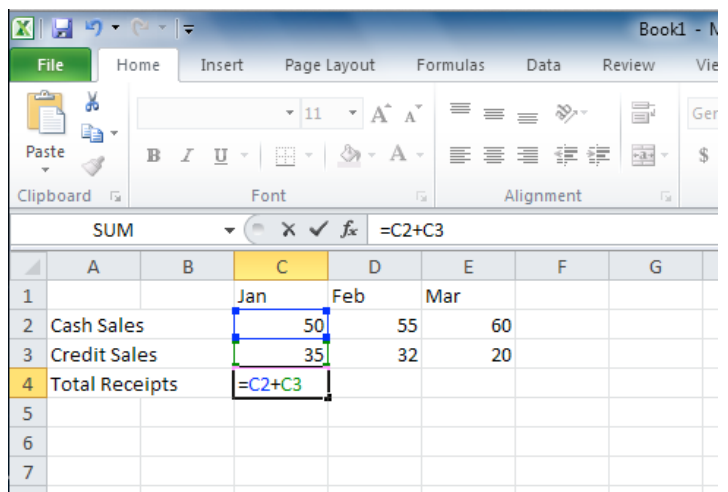
Cells can also be used to display the results of calculations based on values in other positions. Such entries are created by referring to the location of the values to be used in the calculation, rather than the actual amount.
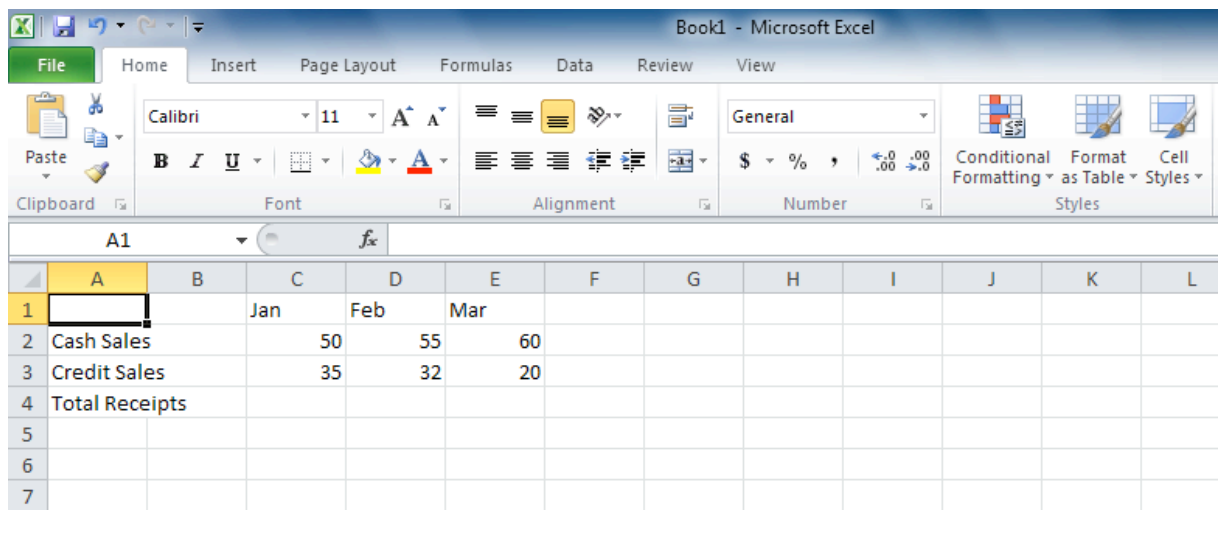
A calculation (or 'Formula') in Excel, must be preceded by the = sign.

Activity 2: With the cursor at cell C4 type the following formula

    =C2+C3   and press the *enter* key ↵

This should display the correct total for the figures above. Note the *formula bar* above the grid displays the formula whilst the result is shown at the cell location.

Activity 3: Enter equivalent expressions for the other two months (i.e. in cells D4 and E4).

Once formulae have been entered into a spreadsheet, by clicking the cursor on an existing number entry then typing in alternative values, the worksheet is immediately recalculated. In other words you now have a 'model' which will work for any range of values.

Activity 4: Replace the Credit sales figure for March with the value 32. You should be able to see an immediate recalculation taking place.

The current worksheet should now look like:

Accessing the Command Menu

Many operations in spreadsheets are performed by accessing options available through Tabs and the ribbon (displayed at the top of the screen in Excel). The latest version of Excel changes the interface as you use it, which means that screens may look slightly different from pictured.
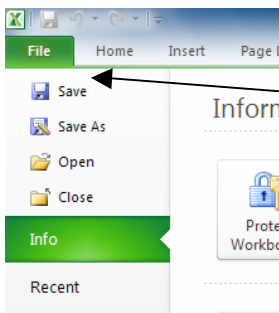
To see the full list of menu items, use the File tab in the corner of the application window
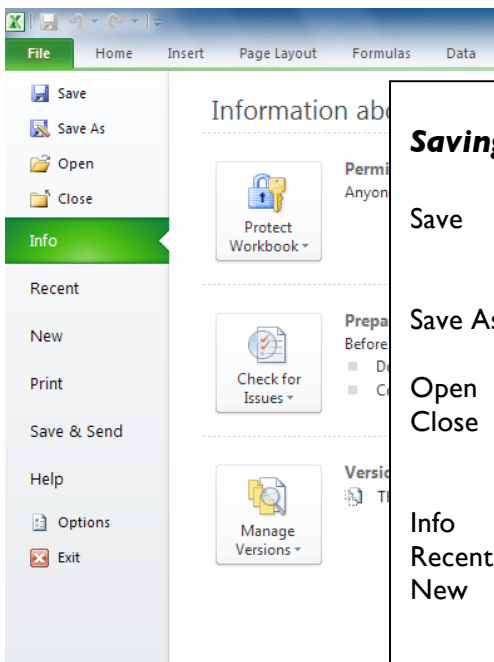
Saving and Retrieving Worksheets

Save	Save the currently opened spreadsheet (if the spreadsheet hasn't been named, the user will be prompted to supply a name and location)
Save As	Save the currently open spreadsheet (typically under a new name or in another location)
Open	Retrieves a previously saved spreadsheet
Close	Close the currently open spreadsheet (if unsaved changes are present, the user will be queried about whether to save or abandon changes)
Info	Information about the current spreadsheet
Recent	See recently used spreadsheets
New	Creates a new blank spreadsheet

Activity 5: Save the spreadsheet in your network area as 'Cash Flow 1'

Activity 6: Extend the current model by adding in entries for Payments and headings for cash flow and balances as in the illustration below.

	A	B	C	D	E	F
1			Jan	Feb	Mar	
2	Cash Sales		50	55	60	
3	Credit Sales		35	32	32	
4	Total Receipts		85	87	92	
5						
6	wages/salaries		53	53	53	
7	services		32.5			
8	rates				15.3	
9	materials		22.5	23	24	
10	total payments					
11						
12	net cash flow					
13	opening balace		20			
14	closing balance					
15						
16						

Actvity 7: Create calculations for the Total Payments in cells C10 to E10. Note: the formula for C10 would be =C6+C7+C8+C9 (i.e. includes any blank cells which may require data at a later stage). Enter the Net Cash Flow calculations (i.e. Total Receipts minus Total Payments) in cells C12 to E12.

The Balance calculations now need to be entered. Assuming the January Opening Balance (at C13) is 20, the January Closing Balance (at C14) is simply created by entering the formula

        =C12+C13

This figure needs to be carried forward as the Opening Balance for February. To do this simply enter (at D13) the expression

        =C14

This will ensure that any result in cell C14 is also displayed in D13.

Enter the equivalent formulae in columns D and E to complete the calculations for the three months before saving the completed spreadsheet as "Cash Flow 2".

Inserting and Deleting Rows and Columns

Basic changes to layout can be made by inserting or deleting rows and columns. The sequence to perform these operations is:

1. Click on the row or column button (the letter above the column or the number to the left of the row - this will highlight the entire row or column)
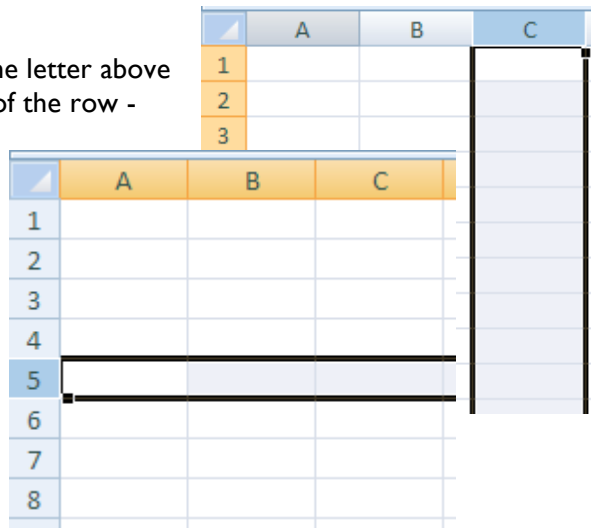
2. In the Home tab, select Insert or Delete from the Cells collection
3. Click on any cell to de-select the highlighted column or row

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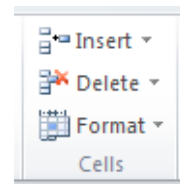
Activity 8: Insert a blank row at the top of the spreadsheet before entering a title **Cash Flow Forecast (£000)** in cell A1.

Click on the row 3 button, insert another row and enter the heading **Receipts:** in A3.
Click on the row 8 button, insert another row and enter the heading **Payments:** in A8.
Click on the column B button, and delete the 'empty' column. Save the current worksheet as Cash Flow 3.

Changing Column Widths

Any or all of the columns on a worksheet may be adjusted to have different widths.

An individual column can be changed by:

1. Positioning the mouse pointer between two column buttons (e.g. A and B), to call up the column width cursor
2. dragging the column width cursor to right or left, to change the column width

To select a 'best fit' for data in a column:

1. position the mouse pointer between two column buttons (as above)
2. double-click the left-hand mouse button

Notes: If you choose a column width that is too small then the cells are filled with # signs. This means the column no longer has room to display the data.

Activity 9: Select best-fit for column A, and reduce the widths of columns B, C and D.

Using the AutoFill Feature

The Autofill feature can used to fill cells based on other (already filled) cells. If actual values are selected, Excel will attempt to repeat an existing pattern (so 10, 20, 30 would generate 40, 50, 60 etc).

1. Click on the first cell whose data is to be copied or extended
2. Move the mouse pointer to the 'Fill Handle' on the bottom right hand corner of the 'active cell', to invoke the AutoFill (black cross) cursor.

3. Drag on the AutoFill cursor from the cell across the required range

Ranges

A group of cells in a contiguous rectangular block is referred to as a *Range* in spreadsheets. They can be defined by typing in their cell references, which is normally the top left corner address followed by the bottom right corner address separated by a full stop (e.g. B2.D2). You can alternatively define a range by using the cursor keys and mouse to extend a highlighted selection.
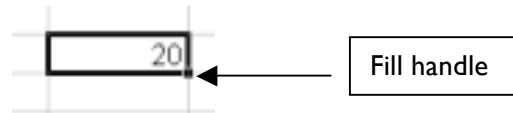

Activity 10: Enter new month headings from *April* through to *June* on the second row, (columns E to G), by clicking on the cell containing the March label (i.e. D2) and dragging on the Fill handle across to cell G2.

With the cursor on the *Total Receipts* calculation for March (at D6), repeat the procedure to copy this to the next three cells across. This will result in 0 entries as there is no data yet for April to June.

Copy the *Total Payments, Net Cash Flow, Opening Balance* and *Closing Balance* calculations (at D13,D15,D16,D17) using similar sequences to that above.

Using Copy and Paste

Where 'blocks' of data need to be copied it is best to use the **Copy** and **Paste**. To do this you would:

1. Highlight the block of data to be copied
2. On the Home tab, in the Clipboard group, click the Copy icon
3. Click on the upper-left point at which the copy is to be placed
4. On the Home tab, in the Clipboard group, click Paste icon
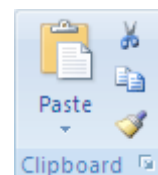
Activity 11: Copy the receipts and payment values across to the last three months (i.e. highlight B4..D5 and copy, then do the same for B9..D12).

Save the model on completion as "Cash Flow 4".

Functions

To complete the model it is necessary to include Totals for the six months. A simple formula could be constructed like   =B4+C4+D4+F4+G4

However this is rather laborious, especially so for a 12 month cash flow. To simplify repetitive or complex calculations, spreadsheets provide a number of built-in Functions. These provide access to a huge range of financial, statistical and mathematical operations.

Each function is entered with the = sign followed by a descriptive word or abbreviation with data or range information between brackets. The syntax is normally   =*functionname(data or range)*

The previous total could be entered as:

=SUM(B4:G4)   *i.e. sum the range from B4 to G4*

Activity 12: Enter the heading **Total** in H2 (alongside the month Headings) and then enter the appropriate sum function into cell H4.

Use the AutoFill feature to copy this formula down to H15 (i.e. click on H4 and drag on the Fill Handle to H15).

Remove the superfluous functions in rows 7, 8 and 14 by moving to each cell then pressing the Delete Key. Save the model as "Cash Flow 5".

Selecting Number Formats

A worksheet may display value data in different ways using the *Number group* in the Home tab.
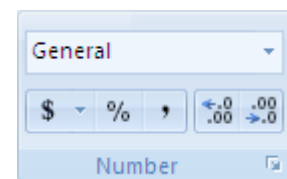
Formatting changes the appearance of the number only, not the value stored in the cell. Commonly used ones are:

Format	Description
General	This is the default number format that Excel applies when you type a number. For the most part, numbers that are formatted with the **General** format are displayed just the way you type them. However, if the cell is not wide enough to show the entire number, the **General** format rounds the numbers with decimals. The **General** number format also uses scientific (exponential) notation for large numbers (12 or more digits).
Number	This format is used for the general display of numbers. You can specify the number of decimal places that you want to use, whether you want to use a thousands separator, and how you want to display negative numbers.
Currency	This format is used for general monetary values and displays the default currency symbol with numbers. You can specify the number of decimal places that you want to use, whether you want to use a thousands separator, and how you want to display negative numbers.

To see all available number formats, click the Dialog Box Launcher next in the   corner of the Number group
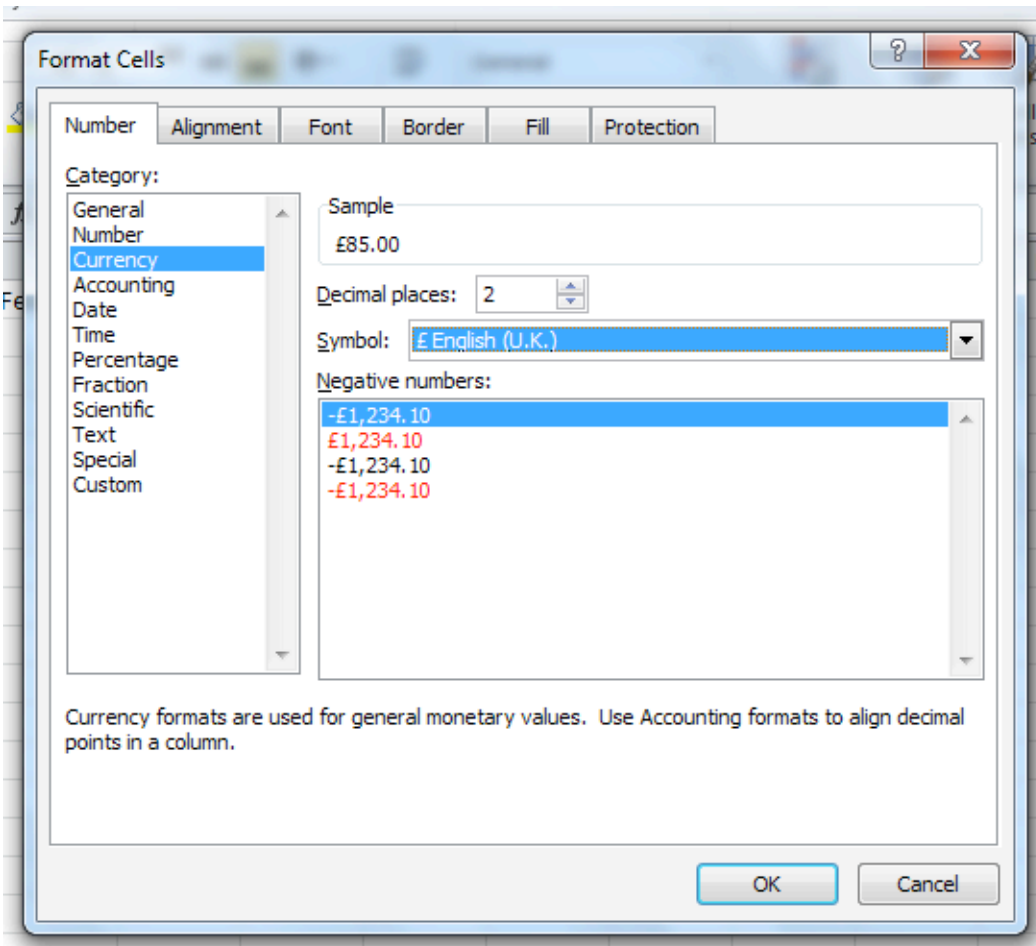
Activity 13: Highlight all the values (e.g. in the range B4.H17). Select *Format - Cells* to call up the Format Cells dialog box (see above). Click on Currency, change the Symbol to none then click on OK.

To set the Total column differently (e.g. to be rounded up to whole numbers), highlight the Total values (in the range H4.H15), select the Format Cells dialogue box again and set Decimal places to 0.

The Ribbon

Office 2007 introduced a ribbon across the top the application window, which shows panels or groups of icons which perform context appropriate tasks (this means that as you use Excel, the ribbon will show different functions/icons dynamically). Indicated below are icons for alignment and increasing/decreasing the number of decimals.

Decrease Decimal

Align Right

Increase Decimal

Align Left

Centre
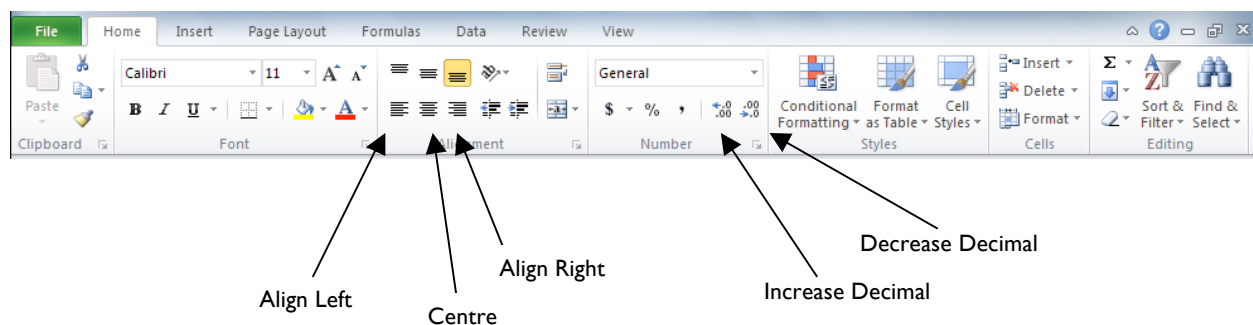
Once values have been set to 2 decimal places, you can increase/decrease the number of decimal places using the Increase Decimal and Decrease Decimal buttons.

Activity 14: Use the tool bar to change the values in the range B4:G17 to 1 decimal place

Aligning Cell Entries

Alignment in a cell may be chosen to be Left, Centre or Right by simply clicking on the align buttons.

Activity 15: Use the tool bar to 'Right' align the month headings.

Borders

In Excel there is a Borders facility which makes it easy to create 'boxed' tables in all or part of a spreadsheet.

Click on the Borders icons to change the border of the currently selected cells

Activity 16: To Emphasise the Receipts figures and calculations place the cursor at A4 (the Cash Sales line) then highlight to cell H6. Click on the 'Down Arrow' button attached to the Borders button and select the 'borders-round-all-cells' option.

Final activity: Place borders around the Payments figures (rows 9 to 13) and the final three rows of calculations (rows 15 to 17). Save the worksheet as "Cash Flow 6".

	A	B	C	D	E	F	G	H
1	Cash Flow Forecast (£000)							
2		Jan	Feb	Mar	Apr	May	Jun	Total
3	Receipts							
4	Cash Sales	50.0	55.0	60.0	50.0	55.0	60.0	330
5	Credit Sales	35.0	32.0	32.0	35.0	32.0	32.0	198
6	Total Receipts	85.0	87.0	92.0	85.0	87.0	92.0	528
7								
8	Payments							
9	wages/salaries	53.0	53.0	53.0	53.0	53.0	53.0	318
10	services	32.5			32.5			65
11	rates			15.3			15.3	31
12	materials	22.5	23.0	24.0	22.5	23.0	24.0	139
13	total payments	108.0	76.0	92.3	108.0	76.0	92.3	553
14								
15	net cash flow	-23.0	11.0	-0.3	-23.0	11.0	-0.3	-25
16	opening balace	20.0	-3.0	8.0	7.7	-15.3	-4.3	
17	closing balance	-3.0	8.0	7.7	-15.3	-4.3	-4.6	
18								