Some Excel techniques explained

This section contains important Excel techniques. These are described in the units where they occur and are collected below for reference.

INT function

Remember in Excel '=' is needed at the start of a formula to be calculated; otherwise the program assumes that INT is just a word you want to type.

The INT function drops the decimal fraction part of a number and returns the integer part. For example, =INT(4.1623) would return 4 and =INT(4.8623) would also return 4. INT has many uses. Getting at the individual digits in a number is of particular value for problem solving.

If cell A1 contained the value 628 then the following formula would extract the hundreds digit: =INT(A1/100)

For the tens digit a similar but slightly more involved formula is needed:
=INT(A1/10) – 10*INT(A1/100)
This formula calculates the number of whole tens (62) and subtracts ten times the number of whole hundreds.

The formula to get just the units digit is A1–10*INT(A1/10)
This is the complete number minus ten times the number of whole tens.

ABS function

The ABS function returns the absolute value. ABS(20–50) would return 30 not –30.

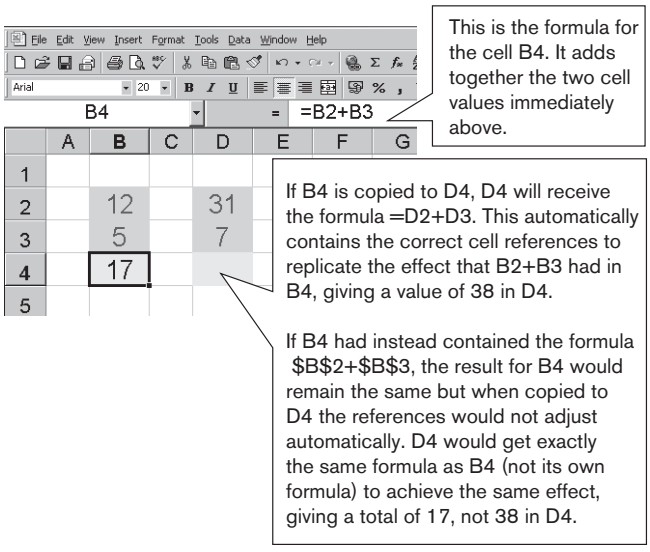
MOD function

The MOD (modulo) function returns the remainder when one value is divided by another. MOD(15,2) would return 1. MOD(15,3) would return 0.

The MOD function is particularly valuable when exploring factors, multiples and remainders.

Absolute cell references

The normal state for the cell references in a formula is to be a relative reference. This means that when a formula is copied into a new position, the new formula automatically has cell references that relate to the new position rather than maintaining the cell references used in the original formula. For example:



Producing a table for a function of two independent variables

As an example here is a simple tables grid:

		2	3	5	7
	3	6	9	15	21
	4	8	12	20	28
	7	14	21	35	49
	9	18	27	45	63

- The cell C3 contains the formula: =C$2*$B3 (i.e. a product formed from two factors)
- The symbol * means multiply in Excel, and although the functions we need to investigate will often involve more than simple multiplication, the process explained below is easy enough to apply even when the function itself is complicated.
- In the illustration above, C2 is the factor from the top row and B3 is the factor from the left hand column.

- The dollar sign, $ in front of the 2 (C$2) and in front of the B ($B3) used in the C3 formula =C$2*$B3, ensures that when the formula is copied from C3 to any other cell the first factor will continue to be taken from row 2 and the second factor will always be taken from column B.
- Once the correct formula has been entered in C3, the keystrokes for the copy manoeuvre are:
  - Select C3 (just click on it).
  - Choose **Copy** from the **Edit** menu.
  - Highlight (click and drag) the C3:F6 range.
  - Choose **Paste** from the **Edit** menu.
- The formula from C3 is copied to all cells in the C3:F6 range. The formula is adjusted for each new position except where a $ sign was placed. As a result, all the new formulae will have a 2 in the first factor and a B in the second factor.

Producing a graph

Two units in this book use graphs. The values in cells give a feel for individual 'spot' values, but a graph can complement that by showing the overall shape of the function. The steps are straight-forward with a little practice.

- Select the two columns of values to plot against each other.
- If the columns are not adjacent, select the first and then hold down the control key while you drag to select the second column.
- From the **Insert** menu choose **Chart**
- Select XY (Scatter) and complete the dialogue box to get the graph.

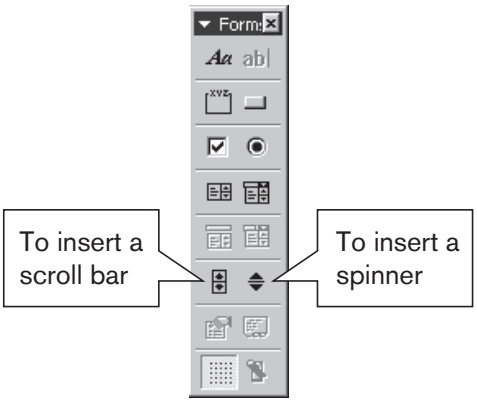
Inserting an increment button (spinner) or scroll bar to control the values in a cell

Many spreadsheets included in this book use spinners when a value is to vary. Without these buttons the keyboard must be used for all changes to cell values. Sometimes it is desirable to keep attention on the spreadsheet and not to use the keyboard at all for entering or changing cell values (e.g. with an interactive whiteboard). This can be achieved using increment buttons. There are two types available. Excel calls them spinners and scroll bars.

The spinner is a two-part button made from an up arrow and a down arrow. The control is set on the spinner so that the values stay within a chosen range and only change in steps of a specified size. The scroll bar is the same but with a slider between the two arrows.

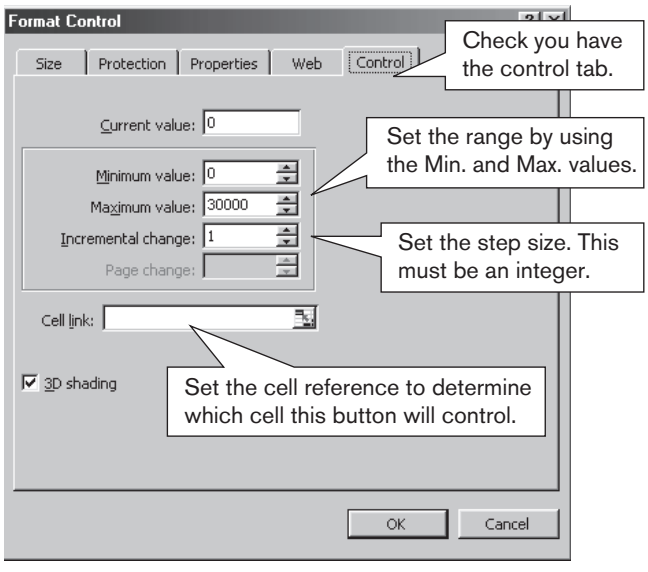
Spinners and scroll bars are found on the Forms toolbar. To obtain this toolbar go to the **View** menu, choose toolbar and select the toolbar Forms. Drag the toolbar to the top or bottom of the workspace. It will then be located amongst the toolbar buttons already there.

Choose the tool (spinner or scroll bar) from the Forms toolbar and then click and drag out the rectangular outline for the button you wish to create. It can be any size. Note that the size and other characteristics can be changed at any time.



After you have a button on the workspace the next task is to connect it to a cell.

Right-click on the button, choose Format Control, and complete the dialogue box.

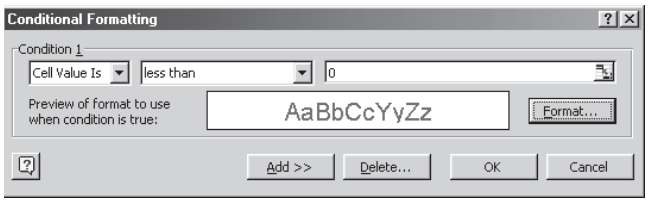


Conditional formatting

Suppose we want a cell that has numbers in blue to switch to numbers in red if that cell

value becomes negative. Here's how that's done.

- Make sure that the correct cell is selected.
- From the **Format** menu choose **Conditional Formatting** and a dialogue box will appear.



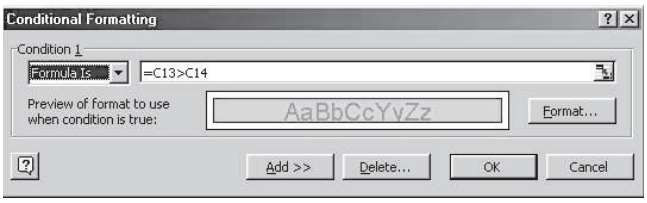
- Set the condition Cell Value Is, less than, 0 as shown in the illustration.
- Click the Format button on the dialogue box to set the appearance that the cell is to have if the condition is met. Notice the limited range of format change that is possible. You can only set the font colour, the fill (background) colour and the cell border colour.
- Click **OK**, and then **OK** back on the Condition box.

Make the cell become negative, then positive, then 0, and so on, checking that the conditional formatting is triggered correctly.

You will notice that a lot more than negative cell values can be tested for.

There is an even more powerful possibility.

The first field in the dialogue box can be set to 'Formula Is' instead of 'Cell Value Is'. The second field then contains a formula, rather than a simple numerical value, and has to start with an equals sign because that is how Excel identifies what follows as a formula to evaluate. This formula is the condition being tested for.



So, in this case, if this was conditional formatting set on cell C9, if C13 was greater than C14 the chosen alternative formatting for C9 would be triggered.

You need to explore this kind of feature for yourself to see other possibilities. There can be up to three independent conditions being tested, which lets cells, for example in 'Multiples grid', have a wide range of colour change possibilities.