Guide to Some Useful Excel Features
(for Excel 2007 GUI)

1. Absolute cell references.

Suppose your spreadsheet entries look like this:

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>3.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>4.5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Suppose you enter into cell B1 the command: A1 + 3 Then B1 would be 5.3. Now if you copied cell B1 into cell B2, what would be the result? It would be 6.1, because if you looked at cell B2, the command would be A2 + 3.

In other words, the copy command assumes that cell references are relative. This is very useful, since it lets the same operation be repeated on all cells in a column.

But sometimes we want have a cell’s address not relative. If, for example, there is a constant which we want to stay the same in all operations. We achieve this by using an absolute cell address: $column$row.

For example suppose C1 = 10.0 and C2 = 5.0, and the command in B1 is A1 + $C$1. Then B1’s value would be 2.3 + 10.0 = 12.3; and if this command is copied into B2 the value of B2 would be 3.1 + 10.0 = 13.1. In other words $C$1 in a command says that the value in C1 should always be used. If the command in B1 is A1 + C1, then when it is copied into B2, the value of B2 would be 3.1 + 5.0 = 8.1.

2. How to import a text file into the spreadsheet.

(a) Copy and paste. Select the range of the data and use the procedure under Data, Text to Column to produce separate columns of data. For large files, this can be cumbersome.

(b) Click “File”, Open. Find and select the text file you want. In next window, select “delimited”, then (as appropriate) select “space” as delimiter, and deselect “tab”. Then click “Finish”.

3. How to make a frequency distribution from a set of data. Suppose you have a large number of individual measurements of some quantity, x, and you want to find the relative probability of getting x. One does this by making histogram of the data. Suppose the data is in a single column. For example, let the data be in the range c1:c1000.
(a) First, make a “bins” column. This specifies the edges of the histogram bins. Example: make a bins column for x between 0 and 17 in range d1:d35. To do this:
   i. Enter 0.0 in cell d1.
   ii. Enter =d1 + .5 in cell d2.
   iii. Copy cell d2, and paste it into cells d3:d35.
This makes a set of equally spaced x intervals between 0 and 17. The last bin will be used for overflow.

(b) Next, select a column of the same size as the bins column. This is where the frequency distribution will be put. Then enter the formula:

\[
FREQUENCY(Dat1 : DatN, Bin1 : BinK)
\]

and press Control-Shift-Enter. Here Dat1 and DatN are the first and last cells in the data column, and Bin1 and BinK are the first and last cells in the bins column.

4. How to Make a Graph. Suppose you have two adjacent columns of numbers, and you want to plot the data with the first column as X and the second as Y. To do this,

(a) Select the (combined) X and Y columns.
(b) Click “Insert” on the top bar, then “Scatter”. (Only scatter will properly place uneven X values.) Generally select points only or lines and points. Select lines if you are plotting hundreds of points.
(c) Now there will be a tab “Chart Tools” at the very top. Click on “Layout” This will present choices for the labels on the horizontal and vertical axes, and the graph title. To enter a label, click on it, delete the generic label with the backspace key, and enter the desired label. The tabs “Design” and “Format” give additional options.
Note: if you go back and click on a cell of the spreadsheet, the “Chart Tools” tab will disappear! To bring it back, just click on the graph. Also, if you want to delete the graph and start over, click on the graph and then press the “delete” key on the computer keyboard.
(d) If the data columns for X and Y are not adjacent, just select just the X column. This will produce an incorrect graph, which you ignore. Then go to “Chart Tools”, ”Design”, “Select Data”. To add a series, click on the “potholder” (the little multi-colored square) which is to the right of “Chart Data Range”, then select the Y data column, then click the “potholder” again. This will produce the correct graph.

5. How to add (y) error bars, using a column of error values. This assumes you have already made a graph.
(a) Make a column in which each cell has the magnitude of the y-error. In general the errors may be different from each other. It is simplest to place this column next to the y data-column (but not essential).

(b) Bring up the “Chart Tools” tab by clicking on the graph. Select “Layout”, then “Error Bars”, then “More Error Bars Options”. This will produce an input screen, and also add both horizontal and vertical error bars to the points on the graph.

(c) Right-click on one of the horizontal error bars and select “delete”. This will get rid of the horizontal error bars.

(d) Now click on a vertical error bar. In the screen, select “Custom”, and then “Specify Value”. Use the “potholders” to select both the positive and negative error values. Then click “OK”. Changes to the error magnitudes will be immediately displayed without repeating the procedure.