

Basic Excel

Excel is a tool that can be used to do various programming tasks. It is not appropriate for all engineering analysis requirements, but due to its prevalence, knowing how to use Excel is an essential skill for 21st century engineers. Here are a few very basic things you should know. If you don't know these things, now is a good time to learn. Open Excel and start playing around with it. The following are difficult to appreciate through reading alone.

Quick keys for navigating large data sets:

- CTRL-down arrow will take the cursor to the end of the column of numbers.
- CTRL-up arrow will take the cursor to the top of the column of numbers.
- CTRL-right arrow will take the cursor to the end of the row of numbers.
- CTRL-left arrow will take the cursor to the end of the row of numbers.
- CTRL-end will take the cursor to the bottom right of all columns and rows
- CTRL-home will take the cursor to the top left of all columns and rows

Graphing

- Select (highlight) the data you want to plot. If you are plotting two or more columns of data, place the cursor at the top of the column and left-click. Hold the CTRL key down to select additional columns.
- At this point, THINK – what is the best way to communicate graphically? If you want to show something as a function of something else (stress as a function of strain, for example), with very few exceptions, use “Scatter (X,Y)” plots, NOT “line” charts. They look very similar, but are very different. (Play around with them to see if you can tell the difference).

Basic math. The following shows how to add columns and rows of numbers. The same sort of thing can be done with any arithmetic operation such as multiplication. This example is provided to demonstrate how to work with “cells” (the little squares where you can type numbers or equations). For this example, the weights of tires and wheels have been entered into Excel, and then mathematical operations were typed into other cells to add various values in the “combined” columns and rows:

	B	C	D	E
2	Location	Tires (lb)	Wheels (lb)	Combined (lb)
3	Front driver	20	30	50
4	Front passenger	18	32	50
5	Rear driver	19	30	49
6	Rear passenger	20	29	49
7	Combined	77	121	198
8	Combined (alternative method)	77	121	198
9	Average	19.25	30.25	49.50

The equations entered into the “Combined” columns and rows look like this (note, there are various ways to do anything in Excel, the bottom two rows demonstrate two different ways to add numbers). The equations created for this table look like this:

	B	C	D	E
2	Location	Tires (lb)	Wheels (lb)	Combined (lb)
3	Front driver	20	30	=C3+D3
4	Front passenger	18	32	=C4+D4
5	Rear driver	19	30	=C5+D5
6	Rear passenger	20	29	=C6+D6
7	Combined	=SUM(C3:C6)	=SUM(D3:D6)	=SUM(E3:E6)
8	Combined (alternative method)	=C3+C4+C5+C6	=D3+D4+D5+D6	=E3+E4+E5+E6
9	Average	=AVERAGE(C3:C6)	=AVERAGE(D3:D6)	=AVERAGE(E3:E6)

You do NOT need to enter all of the equations – cut-and-paste is a much simpler way. Once you type one of the equations, you cut-and-paste into other cells and the row and column numbers are automatically incremented. Practice trying this – you’ll figure it out.

What if you don’t want the cells numbers to increment? For example, let’s make a small multiplication table:

	1	2	3	4
1				
2				
3				
4				

We want to multiply the values in the top row by the values in the left column to produce this:

	1	2	3	4
1	1	2	3	4
2	2	4	6	8
3	3	6	9	12
4	4	8	12	16

If you create the first cell correctly (=B4*C3), you can cut-and-paste the others:

A	B	C	D	E	F
3		1	2	3	4
4	1	=B4*C3	=B4*D3	=B4*E3	=B4*F3
5	2	=B5*C3	=B5*D3	=B5*E3	=B5*F3
6	3	=B6*C3	=B6*D3	=B6*E3	=B6*F3
7	4	=B7*C3	=B7*D3	=B7*E3	=B7*F3

The dollar sign (\$) prevents the column or row number from incrementing when it is cut-and-pasted.

These are a few very basic but essential Excel techniques. Try them on your own – reading about it only can get you going, and is probably very confusing.