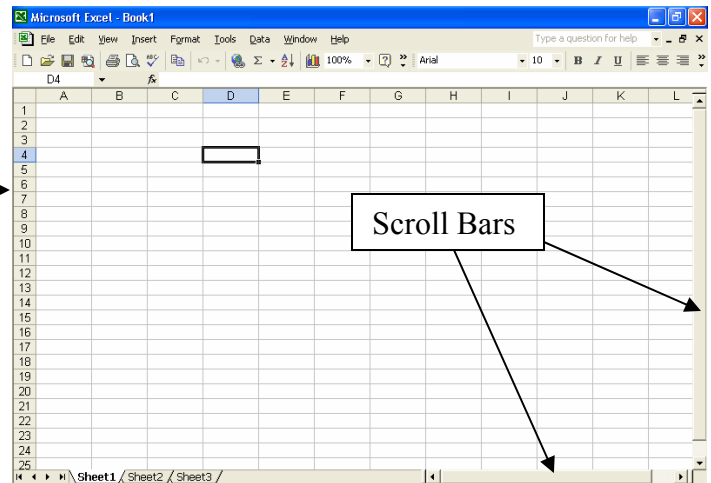


Introduction to Microsoft Excel ®

Find the Excel logo (a green X in a green box).

Double click the Excel logo and see a blank spreadsheet like this.

A spreadsheet is an array of Cells. Each cell has an address like A1, D7, etc. Cell D4 is highlighted. You can enter words, a number, a picture, a date, or a formula into a highlighted cell. Groups of cells are indicated like this, A2:A4, or A1:F1, or A2:B7.



To highlight a cell, move the cursor to the center of the cell and click once. Highlight cell A1. (If you can't see a cell that you want to highlight, use the scroll bars.) Notice that the highlighted cell has a dark border with a small square dot in the lower right corner. Slide the mouse pointer (cursor) to the center of A1 and notice that it is a thick white + sign. Slide the cursor over the little black square dot in the lower right corner and notice that it becomes a thin black + sign.

You can click-drag either cursor shape, but the results will be different. If you click-drag the white +, cells will be selected. If you click-drag the black +, the contents of the selected cell will be copied into the cells that you drag over. This is a very useful way to enter the same formula in a number of cells.

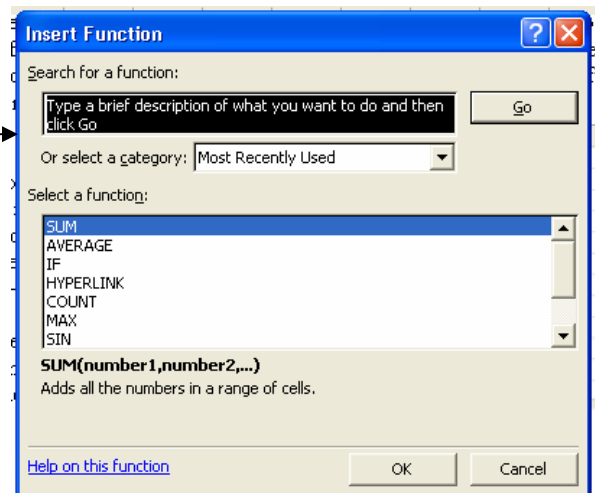
	A	B	C
1	HR		
2	167		
3	150		
4	125		
5	120		
6	150		
7	150		
8	40		
9	136		
10	120		
11	150		
12			

Enter the data. Click in cell A1 to select it. Type “HR” and press the Enter key. The cursor will jump to cell A2. Continue typing the heart rate data from table 3.5. Your spreadsheet should look like this:

Compute the average Heart Rate (\bar{x}). Highlight cell A12. Then click the f_x symbol in the menu bar at the top of the spreadsheet. This will open the “Insert Function” dialog box.

Select AVERAGE and click OK. Use the “fat white plus” cursor to click-drag over the cells that you want averaged and click OK.

Observe the number 130.8 in cell A12. Highlight cell A12 and observe $f_x=AVERAGE(A2:A11)$ in the menu bar at the top of the spreadsheet. (If you ever need to edit the formula, you should work in menu bar, not in the cell itself.)



Compute the standard deviation using the formula $s = \sqrt{\frac{\sum_{i=1}^n (x_i - \bar{x})^2}{n-1}}$.

Algebraic expressions like this one work from the inside out. So the formula tells you to,

- Compute \bar{x}
- For each patient (i) compute the deviation from the average $(x_i - \bar{x})$
- Square each deviation $(x_i - \bar{x})^2$
- Add up the squared deviations
- Divide the total by n-1
- Take the square root of the result.

First compute the deviations. Highlight cell B1, type “Deviations,” and press the enter key. In cell B2 manually enter this formula, `=A2-A$12` and press the enter key. You should observe the number 36.2 in cell B2. This is the deviation of subject 1 from the average. (The purpose of the \$ in A\$12 is to make it an absolute address – when you copy the formula to cell B3 the formula will become A3-A\$12 – different subject, same average.) To copy the deviation formula highlight cell B2, move the cursor to the little black square in the lower right corner so that the cursor becomes a thin black plus. Click-drag the cursor down to cell B11 and release the mouse button. Your spreadsheet should now look like this.

	A	B	C
1	HR	Deviations	
2	167	36.2	
3	150	19.2	
4	125	-5.8	
5	120	-10.8	
6	150	19.2	
7	150	19.2	
8	40	-90.8	
9	136	5.2	
10	120	-10.8	
11	150	19.2	
12	130.8		

Next square the deviations. Highlight cell C1, and type “Squares” and press the enter key. In cell C2 enter the formula `=B2^2` and press the enter key. (The carat ^ means “to the power”, so you are squaring the deviation.) Highlight cell C2 and copy it down to C11 by click-dragging the “thin black plus.” Your spreadsheet should look like this.

	A	B	C
1	HR	Deviations	Squares
2	167	36.2	1310.44
3	150	19.2	368.64
4	125	-5.8	33.64
5	120	-10.8	116.64
6	150	19.2	368.64
7	150	19.2	368.64
8	40	-90.8	8244.64
9	136	5.2	27.04
10	120	-10.8	116.64
11	150	19.2	368.64
12	130.8		

Next sum the squares, divide by n-1 and take the square root. Let’s do it all in one formula. Highlight cell C12 and type this formula: `=sqrt(sum(C2:C11)/9)`. You should observe 35.4708 in cell C12. This is s, the standard deviation. To change the number of decimal places does this: Highlight cell C12. Pull down the “Format” menu (at the top of the page) to “cells.” In the “category” column select “number” and in the “decimal places” field type or select 2. Click OK. (This merely hides the additional decimal places. You could go back and, for example, select 3 decimal places if you wanted to.)

To print your spreadsheet do this: Click-drag the “fat white plus” to select the cells you want to print. Pull down the “File” menu to “Print Area” and slide right to select “Set Print Area.” Single-click anywhere outside the print area to clear the highlighting. You should now see a dotted line around the part to be printed. Pull down the “File” menu to “Print” and select the printer in the usual way. Alternately, you can select the cells you want to print and copy-paste them into an MS Word document.

Extra Credit Assignment:

EC#1) Use Excel to compute the geometric mean $\tilde{x} = \exp\left(\frac{\sum_{i=1}^n \ln(x_i)}{n}\right)$ of the female “distance” data in the reaction-time data set (you can download a spreadsheet containing the data from the course website). e-mail your spreadsheet to the instructor.

Other tutorials

How to graph: <http://www.wellesley.edu/Chemistry/Flick/excel1.html>

In depth: <http://www.usd.edu/trio/tut/excel/>

Good, clear intro, but the examples are all about English football:
<http://www.thekjs.essex.sch.uk/yates/Documents/Statistics.doc>