

Linear Regression

MATH 141

Fall '02

Linear Regression

Suppose we want to find and graph the best fitting line for the following data:

x	0	1	2	3	4	5	6	7	8	9
y	0	2	5	7	9	12	14	16	19	21

To enter the data press the **stat** key and press **1**. Then, in the $L1$ column type the data for x and in the $L2$ column type the data for y . If you already have data in the $L1$ column that you want to delete, scroll up until the $L1$ is highlighted, then press the **clear** key and press enter to remove the data.

After the data is entered, press the **stat** key and press the right arrow key to move to **CALC**. There are several types of regression. In math 141 we want number 4 is linear regression (Be careful: so is 8 and the difference is whether a is the slope or intercept and b is the intercept or the slope.) You will see:

$LinReg(ax + b)$

If you press enter, you will see

$$a = 2.345454545$$

$$b = -.0545454545$$

$$r^2 = .998559856$$

$$r = .9992796686$$

If you do not see the r^2 value, you need to turn on the diagnostic, by pressing the **2nd** key followed by pressing **0**. Scroll down until you highlight the command **DiagnosticOn**. Press the **enter** key and then press **enter** key again. Now, if you run the regression, you should see the r^2 value.

The calculator can put the regression curve into the Y 's, in order to graph the regression curve without typing in the curve yourself, go back and pick the type of regression and press the **vars** key, moving over to the **Y-VARS**, press the **enter** key, and pick the y function that will be assigned the regression curve. You will see:

$LinReg(ax + b) Y1$

If you press the **Y=** key, in $Y1$ you should see the regression curve.

To see the graph with the data, press the **2nd** key followed by the **Y=** key to get to the stat plot. Press number 1 to select *Plot1*. Press the **enter** key over the word *on* to turn on the first stat plot. Make sure the type of plot is a scatter plot (the first one on left). Check that $Xlist : L1$ and $Ylist : L2$.

We need to set the window press the **window** key and set $Xmin = 0$, $Xmax = 15$, $Xscl = 1$, $Ymin = 0$, $Ymax = 25$, $Yscl = 5$, and $Xres = 1$. Then press the **graph** key.