

APPM 2450 Calculus 3 Computer Lab
Lab Exercise 6

Create a Mathematica notebook that does all of the following. Feel free to ask your neighbor or your lab instructor for help if you get stuck. Items with a \blacktriangleright are required, items with a \star are optional.

- \blacktriangleright Download the simple data file that accompanies this assignment to your computer. The file contains a collection of points, (x, y) , where $y = f(x) + \epsilon$ where ϵ represents random noise. Your goal is to determine what $f(x)$ is.
- \blacktriangleright Import the data file into mathematica.
- \blacktriangleright Plot the data using ListPlot.
- \blacktriangleright From the plot see if you can determine a possible relationship between the values, such as $\text{Log}()$ (as shown in the lecture), $\text{Sin}()$, x^n ,
- \blacktriangleright Adjust the X values according to your proposed relationship and construct a new set of (x, y) data. Plot this new data. Does the plot now show an approximately linear relationship?
- \blacktriangleright Now construct a least squares (linear regression) solution as was done in todays lecture. You should end up with a function such as: $L(x) = b + mh(x)$ where b in the intercept, m is the slope and h is the relationship determined above.
- \blacktriangleright Plot the above function over an appropriate domain.
- \blacktriangleright Overlay this plot with the ListPlot of the original data. How is the fit?