

Homework #4

ENGR0012 – Spring 2009

Due: Tuesday , February 3

Modify Homework 3 to add the following requirements.

After the data is plotted, use a pop-up menu that will allow the user to select: Linear, Polynomial, Spline, Semi-log or Log-Log fit.

Use the script from HW3 to select the color and symbol and line type, but modify them so they use a menu for all the options.

If the user selects the Linear or Polynomial options, use the script from HW3 to find the best fit curve. Both options should find the maximum absolute and relative error and the x location for each.

For the spline option, just plot the points and the spline fit. Use at least 300 points to generate the spline graph.

For the Semi-log and log-log sections, be aware that a common problem when fitting data to exponential or power functions are data that are less than or equal to zero. The log of a non-positive number is undefined, thus, the semi-log and log-log sections should filter the data. Do not use the polyfit and polyval commands to generate the best fit curves for the semilog or log log plots, instead use the same linear algebra procedure used in the linear fit. Be careful. You will be fitting a linear line, thus the data you enter into the matrix must produce a linear line. Remember how you did this last semester in Excel? It is suggested you add the polyfirt command into your script as a check, then comment the line out when your method matches the results of the polyfit command. Then find the following:

- The largest absolute error, and the x location associated with this error.
- The largest relative error, and the x location associated with this error.
- The r-squared value.
- Add the r-squared value to the graph
- Add the equation of the semi-log and log-log equation to the graph

Use the 2 data sets on page M-140 and the 4 data sets we used in the EXCEL section on page E-149 to test your script. For each case insert the data into Excel and verify the equations and r squared values.

Deliverable:

Each group should turn in the Matlab script.

Note: Your script must have a header section in comments that identifies:

Team members

Engineering 0012 T,H 00:00-00:00

Instructor:

Date:

Assignment number (i.e., Homework 4)

Statement of the purpose of script

Throughout the script use comments to define the purpose of every variable.

Also, you will be graded on programming style. Use whitespace, comments, indenting, etc.

Hint:

This is going to be a very long program. Layout the logic before you start, and built the program in sections. Do you have existing programs that you can reuse? Make sure each section works before you go onto the next step. Have fun!!!