Mastery Assignment #6 Basics
Fall 2022
Matthew Woodring

This file contains the basics of the sixth mastery assignment. It is intended to provide a basic overview of the assignment and help with any tricky parts.

General Overview:

- Submit your code on Zybooks in the "35. Mastery Assignment #6" section
- All code is automatically graded by Zybooks
- You can submit your code as many times as needed before the deadline
- The assignment is due Sunday, October 30th, 2022 by 11:59pm
- No late work is accepted
- There are no known errors in the grading script as of October 26th, 2022

Task 1:

- What function is used to load in '.csv' files?
- Remember to use element-by-element operations for the stress and strain calculations
- You can define the sigma and epsilon characters by doing 'sigma = char(963)' and 'epsilon = char(949)', these are unicode characters
- The 'sprintf' function will be useful for making the axis-labels
- The 'title', 'grid', 'xlabel', and 'ylabel' functions will be useful here
- Make sure you include the sigma and epsilon characters in your axis-labels!

Task 2:

- Treat the 'strain' data as your x-variable and the 'stress' data as your y-variable
- Remember, you must split the data into thirds!
- The 'polyfit' function is useful for creating the best-fit models
- You can create an anonymous function which is equal to the equation of the line of best-fit
- Remember to treat linear, power, and exponential functions differently (see slides on BlackBoard)
- You will need to use the 'polyfit' function and make an anonymous function for each model (linear, power, and exponential)
- Recall that you can find the intersection of two curves by creating a new anonymous function that is equal to the difference of the two curves

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- You can then use the ‘fzero’ function to see where this intersection function is equal to zero, which is where the intersection of the curves occurs
- You will need to find two intersection points
- The ‘fplot’ function will be useful for plotting your curves; be sure to look at the MATLAB documentation!
- Make sure you define the bounds of your plot in the ‘fplot’ function (it is different for the linear, power, and exponential models)
- The ‘sprintf’ function will be useful for making the axis-labels
- The ‘title’, ‘axis’, ‘xlabel’, and ‘ylabel’ functions will be useful here
- Make sure you include the sigma and epsilon characters in your axis-labels!

Task 3:

- Think about offsetting as shifting the slope of the linear curve by 20% (0.2)
- Use an anonymous function to create this offset curve
- You will have to calculate another intersection point since the offset curve intersects one of your original curves (think about which curve it will intersect)
- The ‘fplot’, ‘plot’, and ‘text’ functions will be useful here
- Remember to output the yield strength to the command window!

Task 4:

- The ‘zeros’ function will be useful here
- Make use of ‘for’ loops in this task!
- The ‘sprintf’ function will be useful here
- The rest of this task is just classification; be very careful with your ‘if’ statements because this section is tedious
- Recall how we output a table to the command window using the ‘fprintf’ function and the ‘\t’ (tab) escape character
- Making the table will likely require some trial-and-error with formatting

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Mastery Assignment #6 is likely the hardest MA you will encounter this semester. However, it is also one of the most important because the topics it covers (‘polyfit’, anonymous functions, and regression) will likely appear on the final. This is not an MA you can wait until the last minute to start on. It will require a decent amount of time to troubleshoot any errors that may occur. Please make sure you can complete all of MA6 by yourself without the aid of notes or other people. Also, before the final exam, make sure you can complete MA6 in the recommended proficiency time of 45 - 70 minutes.