Mastery Assignment #3 Basics
Fall 2022
Matthew Woodring

This file contains the basics of the third 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 "32. Mastery Assignment #3" 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 2nd, 2022 by 11:59pm
- No late work is accepted
- There are no known errors in the grading script as of September 26th, 2022

Problem 1:

Task 1:

- Highly recommend storing the constant $(1 / (3.19 * 10^9))$ in a variable
- Make use of logicals
- You do not need any 'if' statements
- Notice that each subsequent line of the deflection equation is just an extended version of the equations(s) above it. Can this fact be useful in some way? Perhaps with logicals?
- Can the three separate equations be generalized into one equation with logicals? If yes, how can this be done?
- The function can be efficiently coded in 4 - 5 lines of code

Task 2:

- The 'input' function and 'fprintf' function will be useful here
- Recall how to call a function

Task 3:

- For the best results, use 0.01 as the step size between 0 and the user-input
- Recall how to call a function

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Problem 2:

Task 1:

- Recall that, if the user exits the menu, a '0' is returned
- The 'error' function will be useful here

Task 2:

- Remember to load in the '.mat' data in the function
- Recall that indexing starts at '1' in MATLAB
- Notice that the first value in 'ColorCode' is '0'. How might this affect indexing?
- Recall that strings are treated as character arrays in MATLAB, which means you can index them
- How can you find the total amount of zeros in the given input?
- Notice that the values in 'Multiplier' can be expressed in base 10 (i.e. $10^0 = 1$, $10^1 = 10$). How might this affect indexing?
- You do not need any 'if' statements
- Make sure your output is a [1x3] row vector
- The function can be efficiently coded in 5 - 6 lines of code

Task 3:

- Remember to load in the '.mat' data in the function
- The 'find' function and 'strcmpi' function will be useful here
- Recall that indexing starts at '1' in MATLAB
- Notice that the first value in 'ColorCode' is '0'. How might this affect indexing?
- Notice that the values in 'Multiplier' can be expressed in base 10 (i.e. $10^0 = 1$, $10^1 = 10$). How might this affect indexing?
- Think about what the three numbers (one corresponding to each color) you pull from the input vector represent. How can you create a single numerical output from them?
- You do not need any 'if' statements
- Make sure your output is a single value
- The function can be efficiently coded in 5 - 6 lines of code

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Task 4:

- ‘if’ statements will be useful here
- The ‘error’ function will be useful here
- Think about how you can check if there are at least three values in the numerical input vector
- Think about how you can check if all values after the first two are zeros in the numerical input vector
- Think about how you can check if there are not exactly three values in the string input vector

Mastery Assignment #3 is an important one because it covers the fundamentals of logicals and introduces the piecewise function style problem, which is frequently seen on exams. This is not an MA you want to wait until the last minute to start. The two problems, especially the second one, can be difficult to comprehend and solve despite having quite elegant solutions. Please make sure you can complete all of MA3 by yourself without the aid of notes or other people. Also, before the second exam, make sure you can complete MA3 in the recommended proficiency time of 30 - 45 minutes for Problem #1 and 1.00 - 1.50 hours for Problem #2.