

Homework 12

ENGR 130, FA 23

Submit the code for both problems as one .m file. Follow all course guidelines for submitting the homework.

“Problem” 1 (4 points)

Watch the TedTalk linked below (“On Being Wrong” by Kathryn Schulz) and for each question below write a response of at least 3 to 4 sentences. The video is about 17.5 minutes long.

https://www.ted.com/talks/kathryn_schulz_on_being_wrong

- 1) What is one point that the speaker made that was particularly impactful for you? Why did it make an impression?
- 2) What actions will you take, based on the content of this video, to help optimize your approaches to problem solving with other students in future courses or on project teams?

Problem 2 (6 points)

The University Farm has received a shipment of oranges from a grocery store that are too ripe to sell. The farm wants to add the oranges to their compost pile, but the grocery store dumped the oranges into a pile by the road. To get the oranges to the compost pile, in true CWRU fashion the farm manager invited engineering students to build a catapult to launch the oranges!

The students launched a few oranges, varying the amount they pulled the catapult back to get limits on the initial vertical and horizontal velocities. They used this data to create a simulation to predict how many of the 150 remaining oranges will land in the compost pile. The code will assume that the initial velocities are randomly distributed within the limits they measured. The students also want to plot the flight paths of all the oranges that don’t make it into the compost.

They created a simulation script including a user-defined function. They know that the ENGR 130 students have experience writing user-defined functions, so they sent over their script for you to debug! Find and correct each error so that the code runs as intended. Mark each error with ‘% ***’ followed by an explanation. Errors will be found in both the main script and the function.

Some additional things to know:

- The oranges leave the catapult 50 m higher than the compost pile.
- The nearest edge of the compost pile is 500 m from the catapult.
- The compost pile is quite large, so it may be assumed that no oranges will overshoot it; if they go 500 m or more, they will be considered to have landed in the pile.
- The oranges are remarkably identical and each has a mass of 200 grams.
- The flight path is unobstructed.
- All calculations should be in metric.
- The flight paths of all the oranges that miss should be plotted on one plot.

The code is in the file HW12_Code_with_Errors

Hint: There are 6 errors!

Problem 3 (11 points)

It is your turn to create a MATLAB debugging problem for potential use by your classmates in preparing for the final exam! Your problem will consist of two parts, following the specified criteria:

- 1) A problem statement, including
 - a context for why the code was written
 - what the code is supposed to accomplish
 - code with errors, such that
 - there are between 10 and 30 executable (i.e., non-commenting) lines
 - there are 5 unique errors
 - there are sufficient comments for your classmates to understand what each portion of the code is supposed to do
 - good coding practice, such as white space, indenting, and meaningful variable names, are used to aid your classmates in interpreting the code
- 2) Code that functions as intended, with
 - each of the errors corrected
 - each correction identified with a comment starting with `***` explaining the correction

The instructional team will choose several submissions from each section to include in the practice materials for the final. If yours is selected, you will have the option of whether you want your name to appear with it or whether you would prefer to remain anonymous.