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atm63
MAE 2120
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Project 2 Report

User Manual:

When running the program Mathews_atm63_Project2.m, the user will first need to select four input files.

- First select the file called "Mathews_atm63_history.txt" which contains the average wind speeds and operating hours per day for the wind turbine for each month.
- The second file the user should select is "Mathews_atm63_material.txt" which contains the material properties of RQC-100 Steel which the wind turbine is made of.
- The third file the user should select is "Mathews_atm63_geometry.txt" which contains the geometry values of the wind turbine shaft lengths, diameters, and radii of the gears.
- The fourth file the user should select is "Mathews_atm63_parameters.txt" which contains the parameters for system.

After these files are selected, the program will output the factors of safety for yielding, fatigue, and twist in the different segments of the shaft as well as the total mass of the shafts using the diameters of the shafts given in the input files.

The program will then prompt the user if he or she wants to change the values for the diameters of the shafts.

- If yes, the user will type "1" and press enter.
 - The user will then enter the desired values for each shaft diameter. If the user does not want to change the value for a certain diameter, the user will enter "-1" and the diameter will remain the same value as the previous iteration.
 - After entering all the values, the program will output all the factors of safety and total mass again, and once again prompt the user if he or she would like to change the diameters of the shaft.
- If no, the user will type "0" and press enter.

The program will then write an output file containing all the final shaft diameters, the masses of the shafts, and the total mass of the shafts. This file will be called "Final_Design.mat" and will be located in the current folder.

Final Design

d1 = 0.0735 m
d2 = 0.0660 m
d3 = 0.0555 m
d4 = 0.0385 m