Problem Set for 3/22/2024

Engineering 104 - Fundamentals of Engineering Computing

Formatting, Organization & Code Comments - Complete the following problems in `Python` and include as part of the submission of the appropriate assignment. Your assignment file should include a proper heading, comments and show clear organizational structure with each problem clearly printed, separated and with each result variable clearly displayed. All problems worked should have a formatted/structured print-out. Print a string denoting each problem, with the solution to the problem clearly printed as a formatted string below the denoted problem. Separate each problem using a blank line in both the code and the printed results. Code comments should be completed throughout the file on every line of code by default. If this assignment requires you to write and submit additional auxiliary script, or any other files in the submission, please append your initials capitalized to the end of the file name.

Python Lecture #22 Problems - Plotting I (10 Points)

Problem 22.1 (4 Points) - *Plot* $y = 2cos(x)$ *and* $z = \frac{1}{2}sin(x)$ *on the same figure in the range of* x *between* 0 *and* 4π. *The plot should have the following:*

- *80 data points and a black line plotted for each curve*
- *Two different markers with different colors for the two different functions, which must be set*
- *Have correct labels for the independent and dependent axis, font size of 15*
- *A modified marker and line size*
- *A legend with the properly formatted math equations for each function* y *and* z

Problem 22.2 (4 Points) - *Repeat Problem 22.1 but with only 20 values of* x *between* 0 *and* 4π. *Make the following modifications to the figure:*

- *Place the two curves on two separate subplots that split the figure window horizontally.*
- *Use different colors for the markers in the plot than used in Problem 22.1*
- *Use array object accessing to put titles on each of the subplots*
- *Add vertical black error bars (width of 0.5) to one of the two plots in the subfigure. The error bars should have caps*
- *Make sure each subplot has a legend and put the legend of the lower figure in the lower left corner of the plot*
- *The plots should share x-axis labels*

Problem 22.3 (2 Points) - *As a printed statement state why the black lines on each of the plots from 22.2 are inaccurate representations of the functions, especially as compared to the lines in Problem 22.1.*