TEXAS A&M UNIVERSITY

ENGR 102 - Lab Assignment #8

Fall 2019

General course learning outcomes:

- demonstrate programming techniques in the construction of computer programs, including techniques: collect create store and manipulate data in larger structures such as arrays, matrices, and lists; and use control structures, such as conditionals and loops.
- apply programming techniques to solve problems in engineering, including plotting data.
- complete a team programming assignment that ties together concepts learned in the class.

Activity 1: Deep Plots by Jack Handy - to do in lab (team)

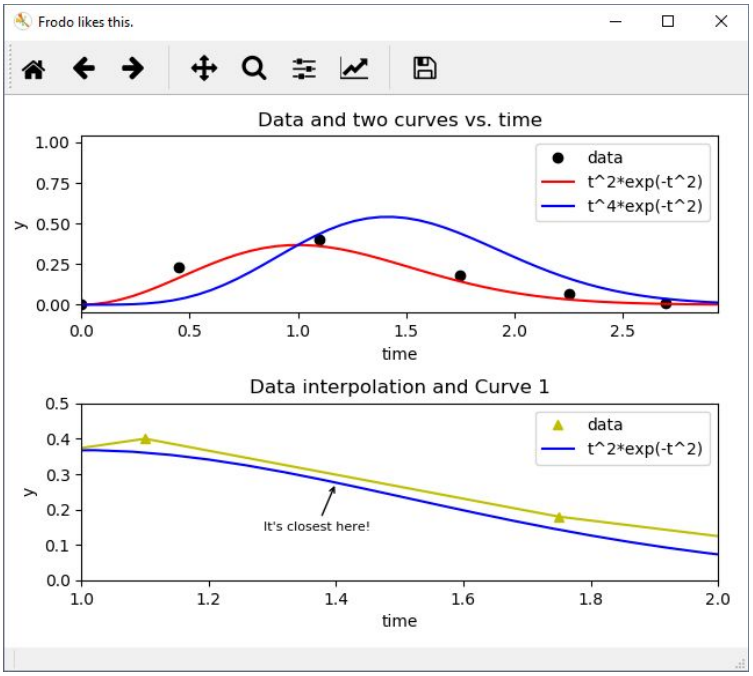
☑ *Use lists, loops and matplotlib functions to create professional plots in Python.*

Write a Python program to generate the following plot as exactly as possible.

Data values: t = [0, 0.45, 1.1, 1.75, 2.25, 2.7] and y = [0, 0.23, 0.4, 0.18, 0.07, 0.01]

Function 1: $y(t) = t^2 \exp(-t^2)$

Function 2: $y(t) = t^4 \exp(-t^2)$



A few requirements and hints:

A. Use a loop to solve for each function at least 50 times between 0 and 3 and store the values in a list. *Do not use numpy / arrays for this assignment.*

B. Don’t actually interpolate the data by formula for the second plot, just plot a line between data points.

C. You can make the legend prettier if you’d like, but it’s not required (i.e., “t^2 exp(-t^2)” instead of “t^2*exp(-t^2)”).

D. Note the figure has a title, there are plot titles, axis labels and ranges, legends, an annotation and specific location (get it close to the same spot), and specific colors.

E. If your figure has axes and title that are overlapping each other, try the pyplot.tightlayout() command directly before showing your plot.