Comp125 - Homework 4

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Plotting Equations in Python

In this project we are going to use matplotlib to plot mathematical equations in Python. Carefully go through each part and plot the figures in the exact required format.

a) Draw function: Write a Python script named draw function(tuples list) to receive a list of tuples which contain the xy-coordinates of a function, as input and plots them in a figure.

Input1: is given in form of $[(x_1, y_1), (x_2, y_2), ..., (x_N, y_N)]$ and the program plots the y vs the x values.

Assume that your function receives a second input plot style, which is a dictionary containing the plot properties.
Input2: is given in terms of a dictionary and contains instruction of your plot style. namely: color, linestyle, linewidth, label, xlabel and ylabel.

For example, given tuples list = $[(1, 1), (2,2), (3,3)]$ and plot style = {'color': 'r', 'linestyle': - -:', 'linewidth': 3, 'label': 'y=x', 'xlabel': 'x-axis', 'ylabel': 'y-axis' }, the draw function will look like below.
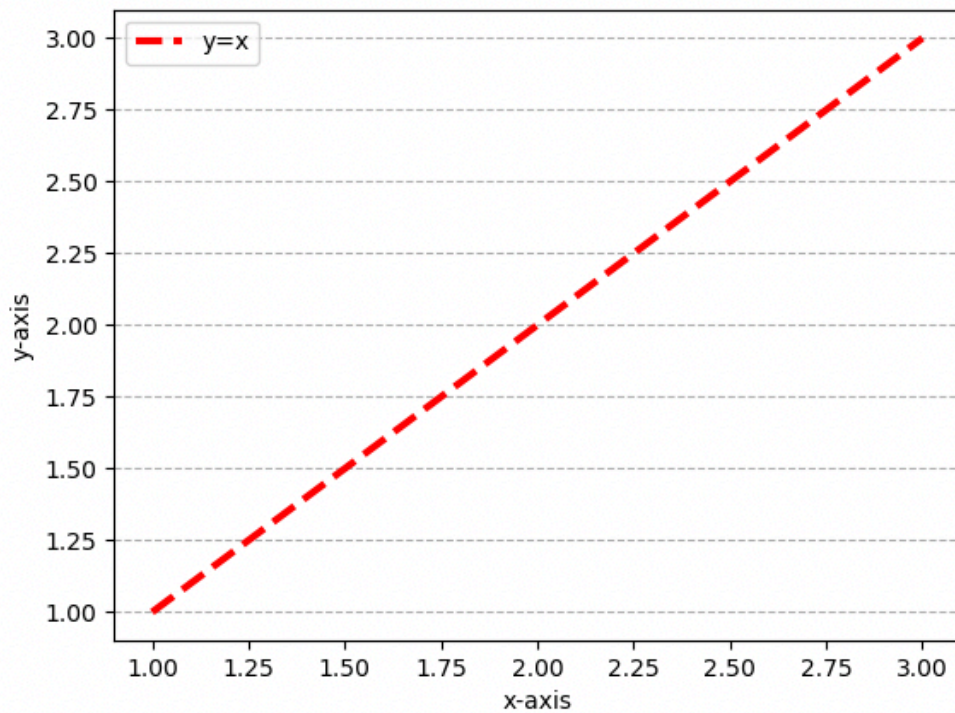
Figure 1: Output of example in bonus.

b) Read function from file: xy coordinates of a function are given in **sample.txt** file. At each line of the file, the first element presents the x value and the second element is the y value. Write a script to receive a
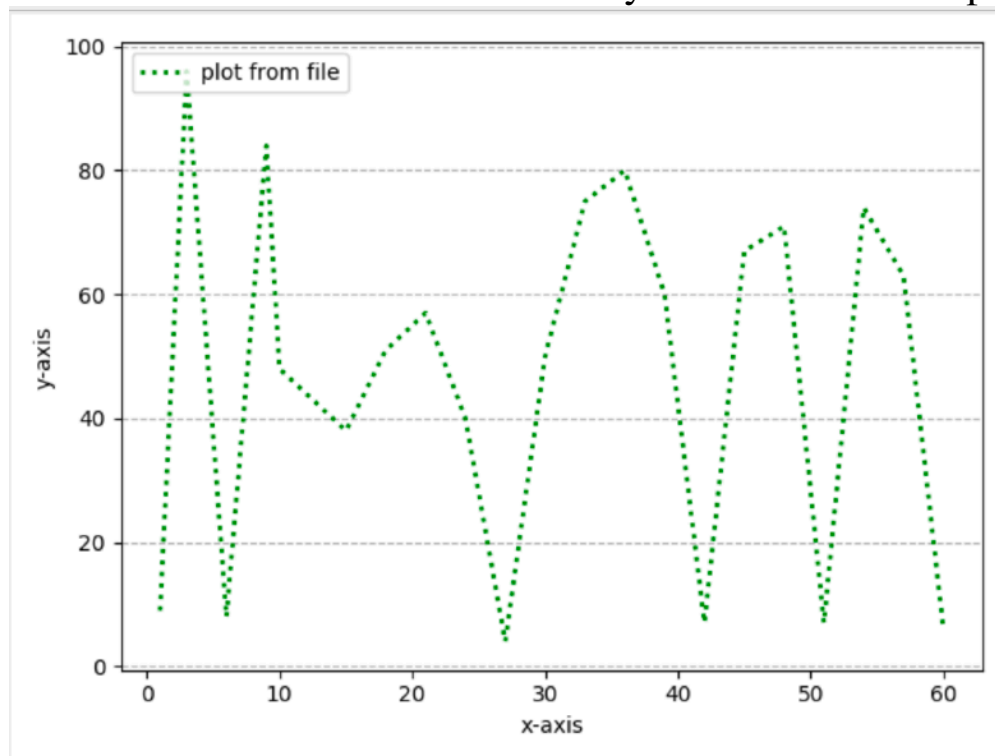

Figure 2: Output of part b.

filename, parse the file contains into a list of tuples and use the function in part a to plot it with the following properties.

• dotted green line of width 2, dashed y axis grids, legend on top left corner, x and y axis labels.

c) Use the function you wrote it part a to plot the $y = e^{-x^3}$ for $x \in [0,5]$ with the following properties.

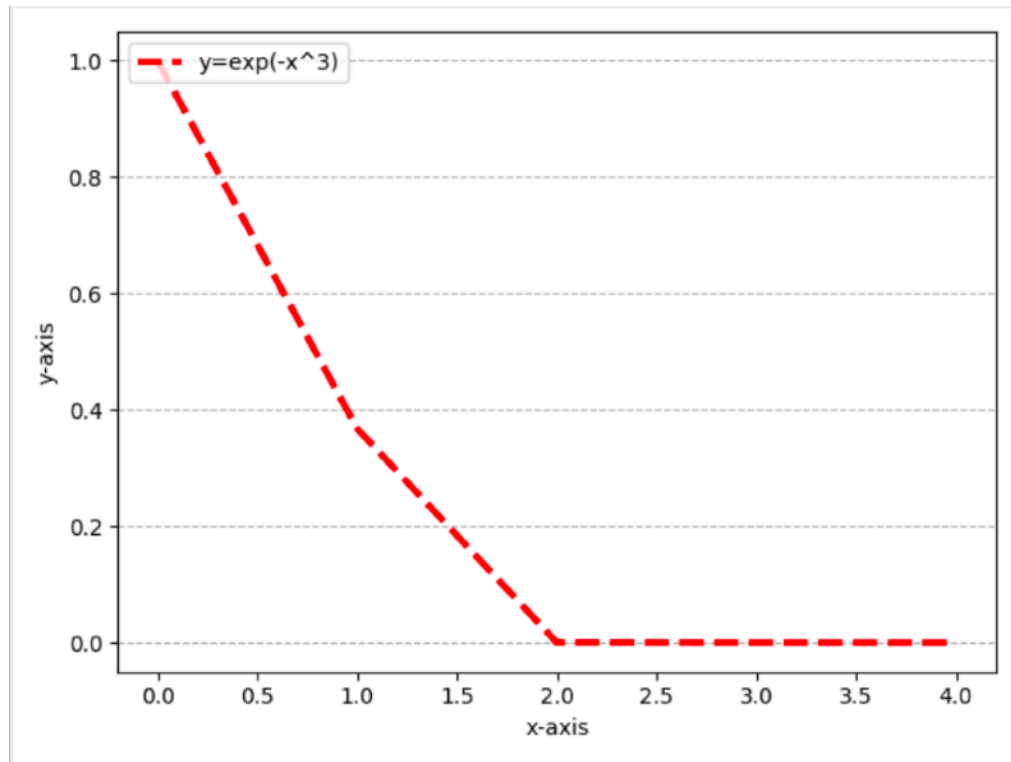• dashed red line of width 3, dashed y axis grids, legend on top left corner, x and y axis labels.

Figure 3: Output of part c.