

Signals and Systems EEN 303 Fall 2020

Lab -0

The purpose of this lab is to prepare EEN303 students to be familiar with the use of MATLAB to generate engineering signals and plot their graphs using available plotting styles offered in MATLAB. This also will allow students to learn how to demonstrate and present engineering and scientific results in an appropriate way.

Experiment:

A- You are required to write script MATLAB file following these steps:

- 1- Generate a row vector of 500 linearly equally spaced points between 0 and 2π .
- 2- Plot on the same figure in the interval $[0, 2\pi]$ the functions

$$f(x) = x e^{-x}, \quad 0 < x < 2\pi$$

$$y(x) = 2^{\cos(x)}, \quad 0 < x < 2\pi$$

- 3- Add a title (of your choice) to the graph.
- 4- Label the two axis of the graph.
- 5- Insert a legend for all functions that appear in the graph.
- 6- Plot the above functions at a second figure in two different subfigures.

B- Write a technical lab report using the appropriate technical writing format.

EEN 303 Fall 2020

Lab -1

Report

by

Student Name:

Date:

Introduction:

This lab experiment was implemented at the computer Lab EE102 using MATLAB. This report explain the script file and obtained graphical results displayed in different plotting styles.

Purpose:

The purpose of this lab is to simulate the introduced engineering signals and obtain their graphs using different plotting styles offered in MATLAB. This lab also shows how to demonstrate and present engineering and scientific results with the appropriate way.

Results and Discussion:

Functions x and y were simulated in MATLAB using the following script file:

```
clear all
clf
x=linspace(0,2*pi,500);
f=x.*exp(-x);
y=2.^cos(x);
plot(x,f,x,y);
title('Two functions');
xlabel('x-axis');
ylabel('y-axis');
legend('f(x)', 'y(x)');
figure(2);
subplot(211);
plot(x,f);
subplot(212);
plot(x,y);
```

Notice that output graphs were obtained using two different plotting styles. In figure (1) two graphs are presented in a single plot each with specific color. Furthermore, a *legend* command used to indicate each data. In figure (2), x and y were generated separately suing *subplot* command.

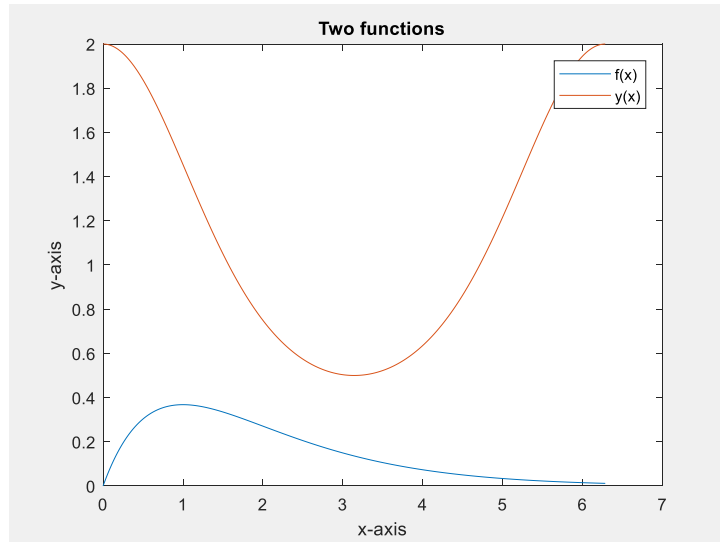


Figure 1: x and y functions in single graph

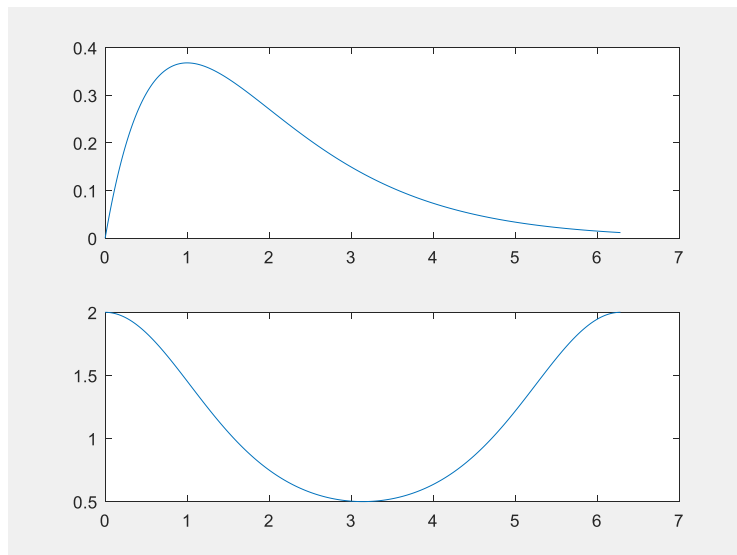


Figure2: x and y functions in 2 subgraphs

Conclusion

In this lab, we were able to generate the given functions using MATLAB and plot their graphs in two different plotting styles. We were able to write their algorithm in logical way where we started first defining independents variable for the correct length. Then functions were written correctly as a vector in order to obtain the required results. The functions were plotted in two different ways. **Legend** property were used to indicate individual graphs using different colors.