CS 115 - Introduction to Programming in Python

Lab Guide 10

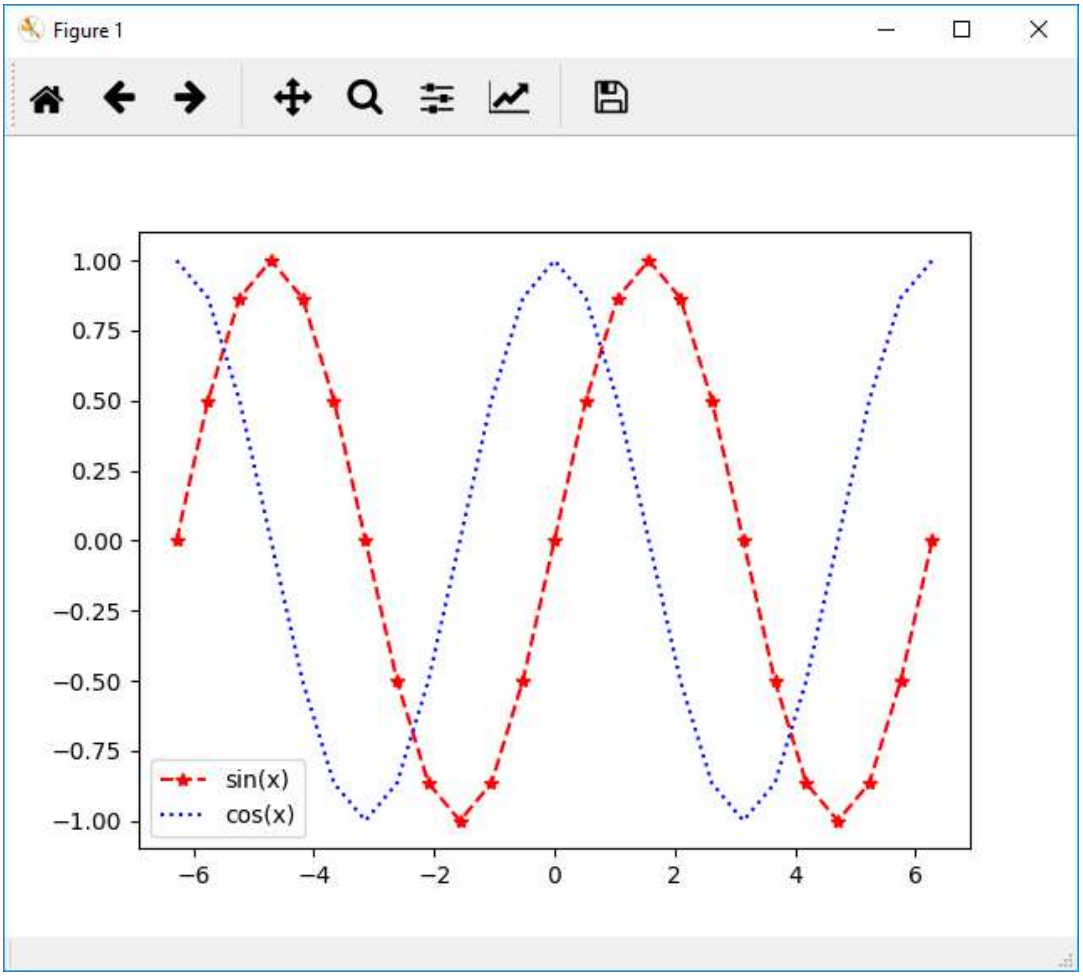
Lab Objectives: Plotting

1) A periodic function is a function that repeats its values in regular intervals or periods. Two such functions are sine and cosine functions. Given the interval $-2\pi \leq x \leq 2\pi$, use 25 equally spaced points.

a) plot **sin(x)** with a red, double-dashed line with the points marked with an asterisk.

b) plot **cos(x)** on the same graph, with a blue dotted line.

c) Finally, make the x axis limits -2*pi and 2*pi and y axis limits -1 and 1. Turn on grid lines, and create the legend shown in the example below.



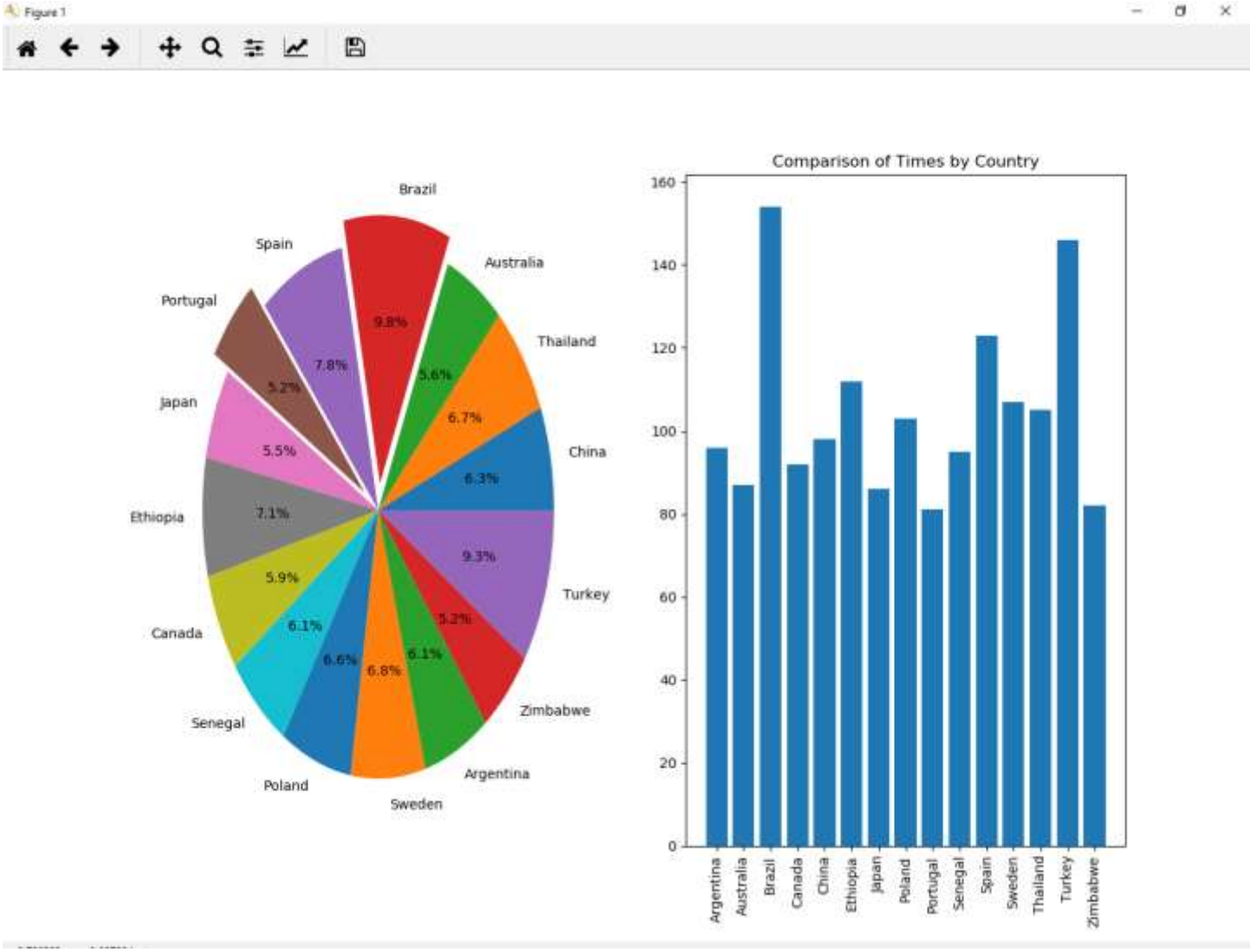
2) The list below stores the scores of athletes in 800 meters run (in seconds):

98, 105, 87, 154, 123, 81, 86, 112, 92, 95, 103, 107, 96, 82, 146

The runners are from the following countries (shown in order): 'China', 'Thailand', 'Australia', 'Brazil', 'Spain', 'Portugal', 'Japan', 'Ethiopia','Canada','Senegal','Poland','Sweden','Argentina','Zimbabwe','Turkey'

Create a pie chart and bar plot that shows the results for each runner . For pie chart, specify the slices and explode the minimum and maximum running time (you can do this by looking at the data and not using min/max functions), and for the bar plot add the title shown.

To rotate the x axis labels, you can use the function from the pyplot package: `xticks(rotation=90)`



3) An experiment measures and writes the penetration depth of a seed (d) every week for 15 weeks in a file called 'seed.txt'. The results are as follows:

8	20	31	42	55	65	77	88	95	97	89	72	68	53	44

Write the script that will read the above data from 'seed.txt' file and will compute the polynomials of curves of different orders fitting these measurements and produce plots of these different order polynomials' curves in the format shown below in the first 2 subplots. All formatting should be arranged according to the figure below.