Lab 8 *(Due: Oct 21)*
Python Programming for Data Science - COSC 3360

Department of Computer Science and Electrical Engineering

Fall Semester, 2022

Exercises

*Create a **New Project** for every exercise. Take a screenshot of the source code along with its output and place the **source code** and the **screenshot** in a **zipped folder** named **LastNameFirstName_Lab8***

Exercise 1

Create a *Numpy* array with values from -1 to $+10$ and a step of 0.1. Plot the **cos** trigonometric function, using the **np.cos()** built-in function

Exercise 2

Similarly to Ex.1, create a *Numpy* array with 120 elements and values that range from -1 to $+10$. Plot the **tan** trigonometric function using the **np.tan()** built-in function

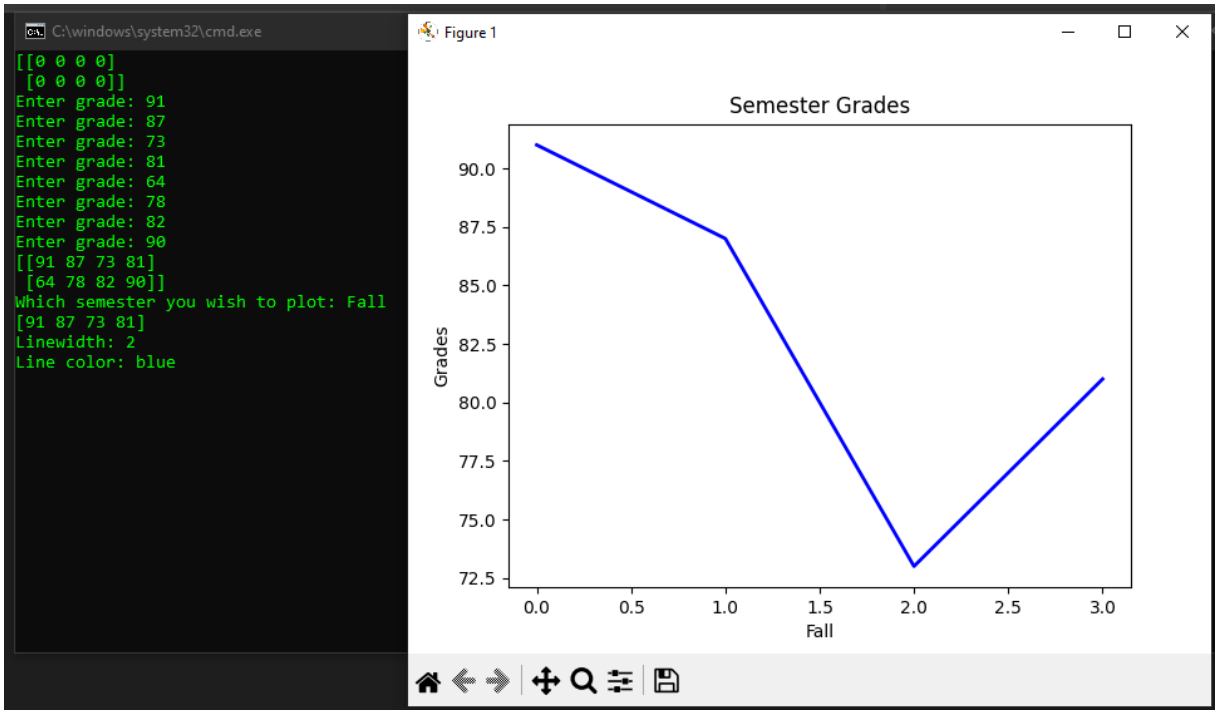
Exercise 3

Create a 2×4 *Numpy* array filled with *zeros*. Using a nested **for** loop enter integer grade values to the elements of the array (assume the first row is Fall Semester and the second row is Spring Semester). Create a *Series* using a dictionary. For *keys* use **'Fall'** and **'Spring'** and for values use the first and second rows from *Numpy* array, respectively (use slicing to get the proper rows). Ask user which *semester* they wish to plot (e.g., Fall), what *linewidth* and *color* they wish to use (the color should be *case insensitive*). Add **title, xlabel, ylabel** to your plot (see Figure in the next page for a sample output)

Exercise 4

Using the original 2×4 *Numpy* array from Ex. 3 filled with Fall and Spring integer grades, first *flatten* it to **1D** array using **deep copy**. Second, create a **Panda Series** that consists of the elements of the **1D** array. Third, print *Series* and produce **descriptive** statistics of *Series* by calling the respective built-in method

Note: Submit through **Canvas**


C:\windows\system32\cmd.exe
[[0 0 0 0]
[0 0 0 0]]
Enter grade: 91
Enter grade: 87
Enter grade: 73
Enter grade: 81
Enter grade: 64
Enter grade: 78
Enter grade: 82
Enter grade: 90
[[91 87 73 81]
[64 78 82 90]]
Which semester you wish to plot: Fall
[91 87 73 81]
Linewidth: 2
Line color: blue
Figure 1
Semester Grades
Grades
90.0
87.5
85.0
82.5
80.0
77.5
75.0
72.5
0.0
0.5
1.0
1.5
2.0
2.5
3.0
Fall