Big Data Programming 1: 2019 (20 Points)

Assignment 3: Numpy

Due date: 26.June.2019
Notice: If you use any self-developed programs or tools for the exercises, also hand in the complete source code and a short documentation. Also, state how you solved the problem. Clearly state literatur you used to solve the exercises and include a link, screenshot or any other form of documentation for all of your sources. Citations must be properly stated when using matierial from other sources. If you split the exercises and not all team members solve all the exercises, state this at the beginning of your answer.

How to submit:

Each student must submit this assignment individually in pdf format.

The excersice must only be done in Python programming language using version 3.

Individual exercises must be submitted by each individual in pdf format with the name convention : matriculationNumber-fullName-BigDataProgramming-Excercise-3.pdf

The pdf must contain
3) The github link to the public source code.

Exercise 1: How to replace items that satisfy a condition with another value in numpy array?(2 Points)

Replace all odd numbers in arr with -1

arr = np.array([0, 1, 2, 3, 4, 5, 6, 7, 8, 9])

Desired Output:array([0, -1, 2, -1, 4, -1, 6, -1, 8, -1])

Exercise 2: How to reshape an array?(2 Points)

Convert a 1D array to a 2D array with 2 rows

arr = np.arange(10)

Desired Output:([[0, 1, 2, 3, 4],[5, 6, 7, 8, 9]])

Exercise 3: How to generate custom sequences in numpy without hardcoding?(2 Points)

Create the following pattern without hardcoding. Use only numpy functions and the below input array

arr = np.array([1,2,3])

Desired Output:array([1, 1, 1, 2, 2, 2, 3, 3, 3, 1, 2, 3, 1, 2, 3, 1, 2, 3])

Exercise 4: How to get the common items between two python numpy arrays?(2 Points)

Get the common items between a and b

a = np.array([1,2,3,2,3,4,3,4,5,6])

b = np.array([7,2,10,2,7,4,9,4,9,8])

Desired Output:(array([2, 4]))

Exercise 5: How to get the positions where elements of two arrays match?(2 Points)

Get the positions where elements of a and b match

a = np.array([1,2,3,2,3,4,3,4,5,6])

b = np.array([7,2,10,2,7,4,9,4,9,8])

Desired Output:(array([1, 3, 5, 7]),)

Exercise 6: How to create a 2D array containing random floats between 5 and 10?(2 Points)

Create a 2D array of shape 5x3 to contain random decimal numbers between 5 and 10.

Exercise 7: How to limit the number of items printed in output of numpy array to 6?(2 Points)

Limit the number of items printed in python numpy array a to a maximum of 6 elements.

arr = np.arange(15)

Desired Output:array([0, 1, 2, ..., 12, 13, 14])

Exercise 8: How to pretty print a numpy array by suppressing the scientific notation (like 1e10)?(2 Points)

Limit the number of items printed in python numpy array a to a maximum of 6 elements.

np.random.seed(100)

rand_arr = np.random.random([3,3])/1e3

Desired Output:array([[0.000543, 0.000278, 0.000425], [0.000845, 0.000005, 0.000122], [0.000671, 0.000826, 0.000137]])

Exercise 9: How to swap two columns in a 2d numpy array?(2 Points)

Swap columns 1 and 2 in the array arr.

arr = np.arange(9).reshape(3,3)

Exercise 10: How to swap two rows in a 2d numpy array?(2 Points)

Swap rows 1 and 2 in the array arr:

arr = np.arange(9).reshape(3,3)