Python Assignment based on Numpy

1. Create 1D,2D and 3D numpy array and print the arrays along with their shape, dimension and data type.

Reshape one 1-D array to 2-D array, 2-D array to 3-D array and 2-D of different shape using numpy

2.i) A 1-D array called zeros having 10 elements and all the elements are set to zero.

ii) A 2-D array called ones having 2 rows and 5 columns and all the elements are set to 1 and dtype as int.

iii) A 2-D array called myarray2 using arange() having 3 rows and 5 columns with start value=4, step size is 4 and dtype as float.

iv) Create a Series object using an ndarray that is created by tiling array by using np.tile() method.

3.Write a Python code using NumPy to do the following:

Create a 2 X 3 array (name: ranarr) of random numbers and display it

Create another 2 X 3 array (name: onearr) of all 1's and display it

Generate an array (name: boolarr) with the elements from ranarr, which are greater than 0.5 and display it Display the shape of this array Use boolarr to Boolean index the array onearr and assign it to a new array (newarr) and display it Display the shape of newarr

Run the above code a number of times, depending on whether the user wants to run again ornot.

Check the shape of newarr in each iteration. Is it same? Justify your answer.

4.Write a Python code using NumPy to do the following:

Take data from user regarding number of rows and columns

Take all the integer elements from the user and put them in a NumPy matrix (m)

Sort the elements in each row of m in ascending order and put it in matrix n

Sort the elements in each column of n in ascending order and put them in p

Ask the user which statistical operation is required? Depending on the reply, find out the minimum, maximum, range, 70th percentile , mean, median, variance, standard deviation of the elements of the matrix and display in appropriate format.

5.Write a Python code using NumPy to do the following:

Take data from user to create a 4 X 3 matrix (m)

Find out the column mean (cm)

Now find out the demean of the columns (demeancol = arr – colmean)

Show how the Broadcasting Rules were applied to do this.

6.Write a NumPy program to insert a space between characters of all the elements of a given array.

7.Write a NumPy program to test equal, not equal, greater equal, greater and less test of all the elements of two given arrays.

8.Create two 3X3 matrix using numpy. Perform matrix addition, multiplication, subtraction, division and find transpose of matrix.

Assignment based on PANDAS

9.Write a Pandas program to create and display a one-dimensional array-like object containing an array of data using Pandas module.

Change index for each data point to new one. like 0,1,2,3 to index = ['d', 'b', 'a', 'c']

Update data point with new index

Use different fancy indexing to display object.

10.Create a Series from a dictionary as given and display it .

{'a': 100, 'b': 200, 'c': 300, 'd': 400, 'e': 800}

Again create a new Series object from this dictionary with index values ['d','b','e','a'] and display it. Use 'isnull' or 'notnull' functions to check values.

Using Pandas data structure, create a data frame from a dictionary of marks in Physics, Chemistry and Mathematics of four students, as given below:

a. Prepare the following data frame.

ID	Name	Physics	Chemistry	Mathematics
1	AAA	56	57	58
2	BBB	70	70	70
3	CCC	90	80	70
4	DDD	65	70	50

5 EEE 96 97   98

b. Add new column Total and Average in the data frame.

c.Add new column Grade bsed on the following Criteria

if(average>=90):grade='O',

if (average <90 and average >=80):grade='A',

if(average <80 and average >=70):grade='B',

if(average <70 and average >=60): grade='C',

if(average <60 and average >=50): grade='D'

else: grade='F'