ASSIGNMENT – 8

1> Write a NumPy program to test whether none of the elements of a given array is zero.

2> Write a NumPy program to test whether any of the elements of a given array is non-zero.

3> Write a NumPy program to test a given array element-wise for finiteness (not infinity or not a Number).

4> Write a NumPy program to test whether two arrays are element-wise equal within a tolerance.

5> Write a NumPy program to create an element-wise comparison (greater, greater_equal, less and less_equal) of two given arrays.

6> Write a NumPy program to create an array of the integers from 30 to70

7> Write a NumPy program to create a 3x3 identity matrix.

8> Write a NumPy program to generate a random number between 0 and 1.

9> Write a NumPy program to find the number of rows and columns of a given matrix.

10> Write a NumPy program to create a 3x3 identity matrix, i.e. diagonal elements are 1, the rest are 0.

11> Write a NumPy program to concatenate element-wise two arrays of string.
Expected Output:
Array1:
['Python' 'PHP']
Array2:
[' Java' ' C++']
new array:
['Python Java' 'PHP C++']

12> Write a NumPy program to capitalize the first letter, lowercase, uppercase, swapcase, title-case of all the elements of a given array.
Expected Output:
Original Array:
['python' 'PHP' 'java' 'C++']
Capitalized: ['Python' 'Php' 'Java' 'C++']
Lowered: ['python' 'php' 'java' 'c++']
Uppered: ['PYTHON' 'PHP' 'JAVA' 'C++']
Swapcased: ['PYTHON' 'php' 'JAVA' 'c++']
Titlecased: ['Python' 'Php' 'Java' 'C++']

13> Write a NumPy program to display all the dates for the month of March, 2017.

14> Write a NumPy program to get the dates of yesterday, today and tomorrow.

15> Write a NumPy program to count the number of days of specific month.

16> Write a NumPy program to convert a list of numeric value into a one-dimensional NumPy array.
Expected Output:
Original List: [12.23, 13.32, 100, 36.32]
One-dimensional NumPy array: [12.23 13.32 100. 36.32]

17> Write a NumPy program to create a 3x3 matrix with values ranging from 2 to 10.
Expected Output:
[[2 3 4]
[5 6 7]
[8 9 10]]

18> Write a NumPy program to reverse an array (first element becomes last).
Original array:
[12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37]
Reverse array:
[37 36 35 34 33 32 31 30 29 28 27 26 25 24 23 22 21 20 19 18 17 16 15 14 13 12]

19> Write a NumPy program to find common values between two arrays.
Expected Output:
Array1: [0 10 20 40 60]
Array2: [10, 30, 40]
Common values between two arrays:
[10 40]

20> Write a NumPy program to get the unique elements of an array.

Expected Output:
Original array:
[10 10 20 20 30 30]
Unique elements of the above array:
[10 20 30]
Original array:
[[1 1]
[2 3]]
Unique elements of the above array:
[1 2 3]

21> Write a NumPy program compare two given arrays.

Array a: [1 2]
Array b: [4 5]
a > b
[False False]
a >= b
[False False]
a < b
[True True]
a <= b
[True True]

22> Write a Pandas program to get the powers of an array values element-wise.
Note: First array elements raised to powers from second array
Sample data: {'X':[78,85,96,80,86],
'Y':[84,94,89,83,86],'Z':[86,97,96,72,83]}
Expected Output:
X Y Z
0 78 84 86
1 85 94 97
2 96 89 96
3 80 83 72
4 86 86 83

23> Write a Pandas program to get the first 3 rows of a given DataFrame.
Sample Python dictionary data and list labels:
exam_data = {'name': ['Anastasia', 'Dima', 'Katherine', 'James', 'Emily', 'Michael', 'Matthew', 'Laura', 'Kevin', 'Jonas'],
'score': [12.5, 9, 16.5, np.nan, 9, 20, 14.5, np.nan, 8, 19],
'attempts': [1, 3, 2, 3, 2, 3, 1, 1, 2, 1],
'qualify': ['yes', 'no', 'yes', 'no', 'no', 'yes', 'yes', 'no', 'no', 'yes']}
labels = ['a', 'b', 'c', 'd', 'e', 'f', 'g', 'h', 'i', 'j']
Expected Output:
First three rows of the data frame:
attempts name qualify score
a 1 Anastasia yes 12.5
b 3 Dima no 9.0
c 2 Katherine yes 16.5

24> Write a Pandas program to count the number of rows and columns of a DataFrame.
Sample Python dictionary data and list labels:
exam_data = {'name': ['Anastasia', 'Dima', 'Katherine', 'James', 'Emily', 'Michael', 'Matthew', 'Laura', 'Kevin', 'Jonas'],
'score': [12.5, 9, 16.5, np.nan, 9, 20, 14.5, np.nan, 8, 19],
'attempts': [1, 3, 2, 3, 2, 3, 1, 1, 2, 1],
'qualify': ['yes', 'no', 'yes', 'no', 'no', 'yes', 'yes', 'no', 'no', 'yes']}
labels = ['a', 'b', 'c', 'd', 'e', 'f', 'g', 'h', 'i', 'j']
Expected Output:
Number of Rows: 10
Number of Columns: 4

25> Write a Pandas program to select the rows the score is between 15 and 20 (inclusive).
Sample Python dictionary data and list labels:
exam_data = {'name': ['Anastasia', 'Dima', 'Katherine', 'James', 'Emily', 'Michael', 'Matthew', 'Laura', 'Kevin', 'Jonas'],
'score': [12.5, 9, 16.5, np.nan, 9, 20, 14.5, np.nan, 8, 19],
'attempts': [1, 3, 2, 3, 2, 3, 1, 1, 2, 1],
'qualify': ['yes', 'no', 'yes', 'no', 'no', 'yes', 'yes', 'no', 'no', 'yes']}
labels = ['a', 'b', 'c', 'd', 'e', 'f', 'g', labels = ['a', 'b', 'c', 'd', 'e', 'f', 'g', 'h', 'i', 'j']
Expected Output:
Rows where score between 15 and 20 (inclusive):
attempts name qualify score
c 2 Katherine yes 16.5
f 3 Michael yes 20.0
j 1 Jonas yes 19.0

26> Write a Pandas program to calculate the sum of the examination attempts by the students.
Sample Python dictionary data and list labels:
exam_data = {'name': ['Anastasia', 'Dima', 'Katherine', 'James', 'Emily', 'Michael', 'Matthew', 'Laura', 'Kevin', 'Jonas'],
'score': [12.5, 9, 16.5, np.nan, 9, 20, 14.5, np.nan, 8, 19],
'attempts': [1, 3, 2, 3, 2, 3, 1, 1, 2, 1],
'qualify': ['yes', 'no', 'yes', 'no', 'no', 'yes', 'yes', 'no', 'no', 'yes']}
labels = ['a', 'b', 'c', 'd', 'e', 'f', 'g', 'h', 'i', 'j']
Expected Output:
Sum of the examination attempts by the students:
19

27> Write a Pandas program to calculate the mean score for each different student in DataFrame.
Sample Python dictionary data and list labels:
exam_data = {'name': ['Anastasia', 'Dima', 'Katherine', 'James', 'Emily', 'Michael', 'Matthew', 'Laura', 'Kevin', 'Jonas'],
'score': [12.5, 9, 16.5, np.nan, 9, 20, 14.5, np.nan, 8, 19],
'attempts': [1, 3, 2, 3, 2, 3, 1, 1, 2, 1],
'qualify': ['yes', 'no', 'yes', 'no', 'no', 'yes', 'yes', 'no', 'no', 'yes']}
labels = ['a', 'b', 'c', 'd', 'e', 'f', 'g', 'h', 'i', 'j']
Expected Output:
Mean score for each different student in data frame:
13.5625

28> Write a Pandas program to change the name 'James' to 'Suresh' in name column of the DataFrame.
Sample Python dictionary data and list labels:
exam_data = {'name': ['Anastasia', 'Dima', 'Katherine', 'James', 'Emily', 'Michael', 'Matthew', 'Laura', 'Kevin', 'Jonas'],
'score': [12.5, 9, 16.5, np.nan, 9, 20, 14.5, np.nan, 8, 19],
'attempts': [1, 3, 2, 3, 2, 3, 1, 1, 2, 1],
'qualify': ['yes', 'no', 'yes', 'no', 'no', 'yes', 'yes', 'no', 'no', 'yes']}
labels = ['a', 'b', 'c', 'd', 'e', 'f', 'g', 'h', 'i', 'j']
Expected Output:
Change the name 'James' to \?Suresh\?:
attempts name qualify score
a 1 Anastasia yes 12.5
b 3 Dima no 9.0
.....
i 2 Kevin no 8.0
j 1 Jonas yes 19.0

29> Write a Pandas program to delete the 'attempts' column from the DataFrame.
Sample Python dictionary data and list labels:
exam_data = {'name': ['Anastasia', 'Dima', 'Katherine', 'James', 'Emily', 'Michael', 'Matthew', 'Laura', 'Kevin', 'Jonas'],
'score': [12.5, 9, 16.5, np.nan, 9, 20, 14.5, np.nan, 8, 19],
'attempts': [1, 3, 2, 3, 2, 3, 1, 1, 2, 1],
'qualify': ['yes', 'no', 'yes', 'no', 'no', 'yes', 'yes', 'no', 'no', 'yes']}
labels = ['a', 'b', 'c', 'd', 'e', 'f', 'g', 'h', 'i', 'j']
Expected Output:
Delete the 'attempts' column from the data frame:
name qualify score
a Anastasia yes 12.5
b Dima no 9.0
.....
i Kevin no 8.0
j Jonas yes 19.0

30> Write a Pandas program to insert a new column in existing DataFrame.
Sample Python dictionary data and list labels:
exam_data = {'name': ['Anastasia', 'Dima', 'Katherine', 'James', 'Emily', 'Michael', 'Matthew', 'Laura', 'Kevin', 'Jonas'],
'score': [12.5, 9, 16.5, np.nan, 9, 20, 14.5, np.nan, 8, 19],
'attempts': [1, 3, 2, 3, 2, 3, 1, 1, 2, 1],
'qualify': ['yes', 'no', 'yes', 'no', 'no', 'yes', 'yes', 'no', 'no', 'yes']}

labels = ['a', 'b', 'c', 'd', 'e', 'f', 'g', 'h', 'i', 'j']
Expected Output:
New DataFrame after inserting the 'color' column
attempts name qualify score color
a 1 Anastasia yes 12.5 Red
b 3 Dima no 9.0 Blue
.....
i 2 Kevin no 8.0 Green
j 1 Jonas yes 19.0 Red

31> Write a Pandas program to rename columns of a given DataFrame.
Sample data:
Original DataFrame
col1 col2 col3
0 1 4 7
1 2 5 8
2 3 6 9
New DataFrame after renaming columns:
Column1 Column2 Column3
0 1 4 7
1 2 5 8
2 3 6 9

32> Write a Pandas program to select rows from a given DataFrame based on values in some columns.
Sample data:
Original DataFrame
col1 col2 col3
0 1 4 7
1 4 5 8
2 3 6 9
3 4 7 0
4 5 8 1
Rows for colum1 value == 4
col1 col2 col3
1 4 5 8
3 4 7 0

33> Write a Pandas program to count city wise number of people from a given of data set (city, name of the person).
Sample data:
city Number of people
0 California 4
1 Georgia 2
2 Los Angeles 4

34> Write a Pandas program to add, subtract, multiple and divide two Pandas Series.
Sample Series: [2, 4, 6, 8, 10], [1, 3, 5, 7, 9]

35> Write a Pandas program to compare the elements of the two Pandas Series.
Sample Series: [2, 4, 6, 8, 10], [1, 3, 5, 7, 10]

36> Write a Pandas program to convert a dictionary to a Pandas series.
Sample Series:
Original dictionary:
{'a': 100, 'b': 200, 'c': 300, 'd': 400, 'e': 800}
Converted series:
a 100
b 200
c 300
d 400
e 800
dtype: int64

37> Write a Pandas program to convert a NumPy array to a Pandas series.
Sample Series:
NumPy array:
[10 20 30 40 50]
Converted Pandas series:
0 10
1 20
2 30
3 40
4 50
dtype: int64

38> Write a Pandas program to convert all the string values to upper, lower cases in a given pandas series. Also find the length of the string values.

39> Write a Pandas program to remove whitespaces, left sided whitespaces and right sided whitespaces of the string values of a given pandas series.

40> Write a Pandas program to find the index of a substring of DataFrame with beginning and end position.

41> Write a Pandas program to check whether alpha numeric values present in a given column of a DataFrame.

42> Write a Pandas program to check whether only numeric values present in a given column of a DataFrame.

43> Write a Pandas program to check whether only lower case or upper case is present in a given column of a DataFrame.

44> Write a Pandas program to check whether only space is present in a given column of a DataFrame.

45> Write a Pandas program to get the length of the string present of a given column in a DataFrame.

46> Write a Pandas program to get the length of the integer of a given column in a DataFrame.

47> Write a Pandas program to convert a specified character column in upper/lower cases in a given DataFrame.

48> Write a Pandas program to split a string of a column of a given DataFrame into multiple columns.