Business Intelligence

(Assignment-1)

(Part-1) (Set-2)

Name: Lutfor Rahman Sohan

Total Questions: 05

Question-1: Write a Python program to extract and accept a comma-separated sequence of word characters from a list, and print the unique words in a new line.

Mapping: for printing unique value from the list, we have to pass the items to a set func. But why "Set()"? Cause, set contains and returns unique values. Which is very suitable for solving this problem.

```
color_list = ['red','blue','white','black','black','red','red']
unique_colors = set(color_list)
for item in unique_colors:
    print(item)
```

```
blue
red
white
black
```

Question-2: Create a 1-Dimensional (1D) array with 16 elements starting from 10 with an increment of 5. Convert the array to a 3-Dimensional (3D) array and display.

Mapping: well, to create the 1D array, i've to import the numpy library and from that, i'll use arange() attribute. After that, i'll use the reshape() to shape the 1D array to 3D.

```
# 1D array making
import numpy as np
one_dim_array = np.arange(10,90,5) # (start, end, step)
one_dim_array
print(f'one dimension array: \n{one_dim_array}')
```

```
# reshaping
three_dim_array = one_dim_array.reshape(2,2,4)
print(three_dim_array)

# check the dim
print(f'Dimensions of three_dim_array.ndim: {three_dim_array.ndim}D')
```

```
one dimension array:
[10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85]
[[[10 15 20 25]
  [30 35 40 45]]

 [[50 55 60 65]
  [70 75 80 85]]]
Dimensions of three_dim_array.ndim: 3D
```

Question-3: Define a and b as 2-D arrays with 3 elements each and merge the arrays vertically as v and multiply by 5.

Mapping: I'll create the array as like i did above with the Numpy. For merging the arrays vertically, i will use vstack.

```
# creating two array (a and b)  where both has 1 row and 3 columns
a = np.array([[1, 2, 3]])
b = np.array([[4, 5, 6]])

# performing merging
v = np.vstack((a, b))
print(f'merging output: \n{v}')

# Multiply the merged array by 5
multiply = v * 5
print(f'multiply output: \n{multiply}')
```

```
merging output:
[[1 2 3]
 [4 5 6]]
multiply output:
[[ 5 10 15]
 [20 25 30]]
```

Question-4: Write a Pandas program that generates a series of numbers starting from 100 to 500 with step 10. Find the positions of numbers that are divisible by 6 of the generated series.

Mapping: To generate the series of numbers, i will use the "Series" class of pandas.

```python
import pandas as pd

# creating the series
series = pd.Series(range(100, 501, 10))

# Identifying numbers divisible by 6
divisible_by_6 = series[series % 6 == 0]

# Finding their positions
positions = divisible_by_6.index

print(f'series output: \n{series}')
print(f"Numbers divisible by 6:\n{divisible_by_6}")
```

```
series output:
0     100
1     110
2     120
3     130
4     140
5     150
6     160
7     170
8     180
9     190
10    200
11    210
12    220
13    230
14    240
15    250
16    260
17    270
18    280
19    290
20    300
21    310
22    320
23    330
24    340
25    350
26    360
27    370
28    380
29    390
30    400
31    410
32    420
33    430
34    440
```

```
35    450
36    460
37    470
38    480
39    490
40    500
dtype: int64
Numbers divisible by 6:
2     120
5     150
8     180
11    210
14    240
17    270
20    300
23    330
26    360
29    390
32    420
35    450
38    480
dtype: int64
```

Question-5:

Dictionary-1: { 'name':['E', 'F', 'G', 'H'], 'class':['four','five','six','seven'], 'roll': [5,6,7,8] }.

Dictionary-2: { 'roll': [5,6,7,8], 'mark':[78,80,85,82] }

- Merge the above two dictionaries into pandas dataframe.
- Sort the merged data frame according to the mark in descending order.
- Save the dataframe into a csv file

Mapping: For merging the two dataframe, i will create two dataframe based on this two dictionaries. And we can merge two dataframe into one by using 'merge()' attribute. After merging, i will sort the dataframe against the mark and will save the dataset to a csv file, named: 'student.csv'.

```
dict_1 = {
'name':['E', 'F', 'G', 'H'],
'class':['four','five','six','seven'],
'roll': [5,6,7,8]
}

dict_2 = {
'roll': [5,6,7,8],
'mark':[78,80,85,82]
}
```

```python
# creating dataframe
df_1 = pd.DataFrame(dict_1)
df_2 = pd.DataFrame(dict_2)
print(f'\n\nthis is first dataframe: \n {df_1}')
print(f'\n\nthis is second dataframe: \n {df_2}')

# merging dataframes
merged_df = pd.merge(df_1, df_2)
print(f'this is merged dataframe: \n{merged_df}')

# sorting the dataframe in terms of mark with descending order
sorted_df = merged_df.sort_values(by= 'mark', ascending= False)
print(f'\n\nthis is sorted dataframe: \n{sorted_df}')

# saving the dataframe to csv file
csv_file = sorted_df.to_csv('student_df.csv')
csv_file
```

```
this is first dataframe:
   name  class  roll
0    E   four     5
1    F   five     6
2    G    six     7
3    H  seven     8


this is second dataframe:
    roll  mark
0     5    78
1     6    80
2     7    85
3     8    82
this is merged dataframe:
  name  class  roll  mark
0    E   four     5    78
1    F   five     6    80
2    G    six     7    85
3    H  seven     8    82


this is sorted dataframe:
  name  class  roll  mark
2    G    six     7    85
3    H  seven     8    82
1    F   five     6    80
0    E   four     5    78
```