ARTIFICIAL INTELLIGENCE

LAB 9

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BS (SE-5th) MORNING

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LAB TASK 1:

Write a NumPy program to create a random 10x4 array and extract the first five rows of the array and store them into a variable.

Code:

```
import numpy as np
x = np.random.rand(10, 4)
print("Original array: ")
print(x)
y= x[:5, :]
print("First 5 rows of the above array:")
print(y)
```

```
Original array:
[[0.28404921 0.84769514 0.83040111 0.63943484]
 [0.35863419 0.01718657 0.45996249 0.1323171 ]
 [0.53616599 0.12945866 0.10769821 0.81223977]
 [0.36043516 0.83675147 0.50477546 0.36126714]
 [0.9850263  0.73417852 0.3576464  0.38418197]
 [0.44208956 0.26463707 0.57447879 0.38364309]
 [0.97860936 0.31513299 0.68460788 0.61647994]
 [0.43609872 0.23051155 0.31519263 0.04098768]
 [0.44295128 0.76464256 0.5530644  0.99282576]
 [0.24689236 0.74291406 0.20192339 0.61664756]]
First 5 rows of the above array:
[[0.28404921 0.84769514 0.83040111 0.63943484]
 [0.35863419 0.01718657 0.45996249 0.1323171 ]
 [0.53616599 0.12945866 0.10769821 0.81223977]
 [0.36043516 0.83675147 0.50477546 0.36126714]
 [0.9850263  0.73417852 0.3576464  0.38418197]]
```

LAB TASK 2:

Write a Pandas program to select the rows where the number of attempts in the examination is greater than 2.

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 attempts in the examination is greater than 2:

name score attempts qualify

b Dima 9.0 3 no d James NaN 3 no f Michael 20.0 3 yes

Code:

import pandas as pd

import numpy as np

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']

df = pd.DataFrame(exam_data , index=labels)

print("Number of attempts in the examination is greater than 2 :")

print(df[(df['attempts'] > 2)])

```
import pandas as pd
import numpy as np

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']

df = pd.DataFrame(exam_data , index=labels)
print("Number of attempts in the examination is greater than 2  :")
print(df[(df['attempts'] > 2)])
```

```
Number of attempts in the examination is greater than 2  :
      name  score  attempts qualify
b     Dima    9.0         3      no
d    James    NaN         3      no
f  Michael   20.0         3     yes
```

LAB TASK 3:

From the sample data given in TASK 2; write a program to calculate the average of the scores. The program should be able to ignore NaN values.

Expected Output: The average score is: 13.56

import pandas as pd

import numpy as np

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']

df = pd.DataFrame(exam_data , index=labels)

df['score'] = df['score'].fillna(0)

print(df.score)

print(df.score.mean())

```
: import pandas as pd
  import numpy as np

  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']

  df = pd.DataFrame(exam_data , index=labels)
  # print("Number of attempts in the examination is greater than 2  :")
  # print(df[(df['attempts'] > 2)])
  df['score'] = df['score'].fillna(0)
  print(df.score)
  print(df.score.mean())
```

```
a    12.5
b     9.0
c    16.5
d     0.0
e     9.0
f    20.0
g    14.5
h     0.0
i     8.0
j    19.0
Name: score, dtype: float64
10.85
```

For viewing code and output , please open the link below

https://github.com/Enggadil/-AI-LAB-_BSSE-5-M-