KONG_Lecture_3_Quiz

September 9, 2022

1 Problem 1

`What is the difference between a pandas Series and a DataFrame?`

Series is kind of a pandas version of a 1D array, while DataFrame is a collection of Series. Series stores a list of values in one attribute, while DataFrame has several columns to serve with different attributes.

2 Problem 2

[1]:

```
import pandas as pd

data = {'width':[(i+1)*5 for i in range(5)], 'height':[(i+4)*6 for i in␣
 ↪range(5)]}
data['width'].append(data['width'][-1])
data['height'].append(data['height'][-1])
data['size'] = [w*h for w,h in zip(data['width'],data['height'])]
sampleDf = pd.DataFrame(data, index = [chr(i+97) for i in range(6)])

print('--- Sample DataFrame ---')
print(sampleDf,'\n')
print('--- Statistic Summary ---')
print(sampleDf.describe())
```

```
--- Sample DataFrame ---
   width  height  size
a      5      24   120
b     10      30   300
c     15      36   540
d     20      42   840
e     25      48  1200
f     25      48  1200

--- Statistic Summary ---
           width     height        size
count   6.000000   6.000000    6.000000
mean   16.666667  38.000000  700.000000
std     8.164966   9.797959  456.420858
```

```
min     5.000000  24.000000   120.000000
25%    11.250000  31.500000   360.000000
50%    17.500000  39.000000   690.000000
75%    23.750000  46.500000  1110.000000
max    25.000000  48.000000  1200.000000
```

3 Problem 3

[2]:

```python
print('With \'.\' -- Select the whole column\n')
print('Example: sampleDf.width')
print(sampleDf.width)

print('\n'+'-'*40+'\n')
print('With [] -- Select columns or rows\n')
print('Example: sampleDf[[\'width\',\'size\']]')
print(sampleDf[['width','size']])
print('\nExample: sampleDf[3:5]')
print(sampleDf[3:5])
print('\nExample: sampleDf[\'b\':\'d\']')
print(sampleDf['b':'d'])

print('\n'+'-'*40+'\n')
print('With \'iloc\' -- Select by index number\n')
print('Example: sampleDf.iloc[1:3,:2]')
print(sampleDf.iloc[1:3,:2])

print('\n'+'-'*40+'\n')
print('With \'loc\' -- Select by name')
print('\nExample: sampleDf.loc[\'b\':\'f\':2,\'height\':\'size\']')
print(sampleDf.loc['b':'f':2,'height':'size'])
```

```
With '.' -- Select the whole column

Example: sampleDf.width
a     5
b    10
c    15
d    20
e    25
f    25
Name: width, dtype: int64

----------------------------------------

With [] -- Select columns or rows

Example: sampleDf[['width','size']]
```

```
   width  size
a      5   120
b     10   300
c     15   540
d     20   840
e     25  1200
f     25  1200

Example: sampleDf[3:5]
   width  height  size
d     20      42   840
e     25      48  1200

Example: sampleDf['b':'d']
   width  height  size
b     10      30   300
c     15      36   540
d     20      42   840

----------------------------------------

With 'iloc' -- Select by index number

Example: sampleDf.iloc[1:3,:2]
   width  height
b     10      30
c     15      36

----------------------------------------

With 'loc' -- Select by name

Example: sampleDf.loc['b':'f':2,'height':'size']
   height  size
b      30   300
d      42   840
f      48  1200
```

4 Problem 4

`What is sorting for categorical variables in pandas DataFrame based on?`

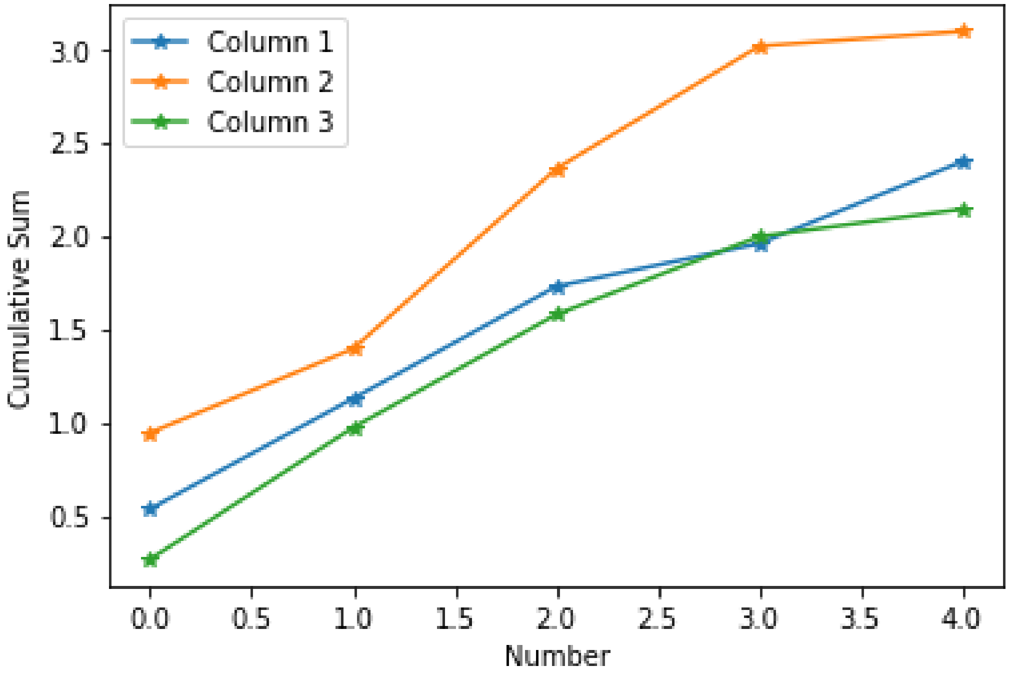
It’s based on the order provided when defining a Pandas Categorical

5 Problem 5

[3]:

```
import matplotlib.pyplot as plt
import numpy as np

randSampleDf = pd.DataFrame(np.random.rand(5,3), columns = ['Column %d'%i for i in range(1,4)])
randSampleDf.cumsum()
plt.plot(randSampleDf.cumsum(), '*-',label = randSampleDf.columns)
plt.legend()
plt.xlabel('Number')
plt.ylabel('Cumulative Sum')
plt.show()
```



6 Problem 6

[4]:

```
df = pd.DataFrame({'Name': 'Alex Tom Steve Clarke Sarah'.split(),
                   'Age': [23, 18, 30, 20, 45],
                   'weight': [151, 140, 180, 124, 120],
                   'Gender': ['Male'] * 3 + ['Female'] * 2})

ages = df.sort_values(by = 'weight', ascending=False)[['Age','Gender']]
ages
```

```
[4]:    Age  Gender
     2   30    Male
     0   23    Male
     1   18    Male
     3   20  Female
     4   45  Female
```

7 Problem 7

```
[5]: meanWeight = df.describe()['weight'].loc['mean']
     df.loc[df['weight'] > 150, 'weight'] = meanWeight
     df
```

```
[5]:      Name  Age  weight  Gender
     0    Alex   23     143    Male
     1     Tom   18     140    Male
     2   Steve   30     143    Male
     3  Clarke   20     124  Female
     4   Sarah   45     120  Female
```

8 Problem 8

```
[6]: df = pd.DataFrame({'Animal': 'cat dog dog dog fish'.split(),
                        'weight': [8, 10, 12, 11, 2]})

     for col in df.columns:
         df['count_'+col] = df[col].map(df[col].value_counts())

     df
```

```
[6]:   Animal  weight  count_Animal  count_weight
     0    cat       8             1             1
     1    dog      10             3             1
     2    dog      12             3             1
     3    dog      11             3             1
     4   fish       2             1             1
```