

EX.NO: 03

DATE : 02/03/2024

PANDAS – DATAFRAME- BASICS

Aim:

To install pandas package and do the basic DataFrame operations

Description:

1. Declaring empty DataFrame
2. Declare and print the DataFrame series
3. Do the basic functions such as extracting one column and one row, adding one row

Programs:

1. Declaring and printing the DataFrame series

```
import pandas as pd

emp = pd.Series(['Parker', 'John', 'Smith', "William"])
Id = pd.Series([102, 104, 203, 501])
frame = {'EMP': emp, 'ID': Id}
result = pd.DataFrame(frame)
print('\n Series to Data Frame\n')
print(result)
```

OUTPUT :

```
Series to Data Frame

   EMP  ID
0  Parker  102
1   John  104
2  Smith  203
3 William  501
```

2. Performing Basic Functions

i) EXTRACTING ONE COLUMN

```
#EXTRACTING ONE COLUMN

print("\n Extracting one Column: \n")
print( result['EMP'])
```

OUTPUT:

```
Extracting one Column:

0    Parker
1      John
2     Smith
3   William
Name: EMP, dtype: object
```

ii) ADDING NEW COLUMN

```
#ADDING NEW COLUMN

result['AGE']=pd.Series([35,24,40,38])
print('\n',result)
```

OUTPUT:

	EMP	ID	AGE
0	Parker	102	35
1	John	104	24
2	Smith	203	40
3	William	501	38

iii) EXTRACTING THE THIRD ROW

```
#EXTRACTING THE THIRD ROW

print('\n',result.loc[2])
```

OUTPUT:

```
EMP    Smith
ID      203
AGE      40
Name: 2, dtype: object
```

iv) SLICING THE ROWS

```
#SLICING THE ROWS
print('\n Slice the rows: \n', result[1:3])
```

OUTPUT:

```
Slice the rows:
      EMP  ID  AGE
1  John  104   24
2  Smith 203   40
```

v) ADDING AND DELETING ROWS

```
#ADDING AND DELETING ROWS
d2 = pd.DataFrame([[ 'Dale',123],[ 'Mark',143]],columns=[ 'EMP','ID'])
print("\n Adding new row values :\n", result.append(d2))
print("\n Deleting particular row:\n", result.drop(1))
```

OUTPUT:

```
Adding new row values :
      EMP  ID  AGE
0  Parker  102  35.0
1   John  104  24.0
2   Smith  203  40.0
3 William  501  38.0
0    Dale  123   NaN
1    Mark  143   NaN

Deleting particular row:
      EMP  ID  AGE
0  Parker  102   35
2   Smith  203   40
3 William  501   38
```

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PANDAS –DATAFRAME – FUNCTIONS

Aim:

To perform Pandas DataFrame Functions

Description:

1. Apply sum and square root functions through Numpy
2. Perform min and max operations through aggregation functions
3. Add new column using assign function
4. Do sort and merge functions

Programs:

i) FINDING SQUARE ROOT OF A DATAFRAME

```
import pandas as pd
import numpy as np

print("DATAFRAME APPLY FUNCTION:\n")
info = pd.DataFrame([[2,7]]*3, columns=['P','Q'])
print("\n Original DataFrame:\n",info)
print("\n Square root of DataFrame:\n", info.apply(np.sqrt))
```

OUTPUT:

```
DATAFRAME APPLY FUNCTION:
```

```
Original DataFrame:
```

```
   P  Q
0  2  7
1  2  7
2  2  7
```

```
Square root of DataFrame:
```

```
   P      Q
0  1.414214  2.645751
1  1.414214  2.645751
2  1.414214  2.645751
```

ii) DATAFRAME ASSIGN FUNCTIONS

```
#DATAFRAME ASSIGN FUNCTIONS

print("\nDataFrame Assign Function:\n")
d2 = pd.DataFrame([[ 'Dale', 123], [ 'Mark', 143]], columns=[ 'EMP', 'ID'])
print("\nOriginal DataFrame:\n", d2)
d2[ 'AGE']=[35,40]
```

OUTPUT:

```
DataFrame Assign Function:
```

```
Original DataFrame:
```

	EMP	ID
0	Dale	123
1	Mark	143

iii) ADDING NEW COLUMNS

```
#ADDING NEW COLUMNS

print("\nAdding new column:\n", d2)
d = d2.assign(sex=[ 'Male', 'Male'])
print("\nAdding new column:\n", d)
```

OUTPUT:

```
Adding new column:
```

	EMP	ID	AGE
0	Dale	123	35
1	Mark	143	40

```
Adding new column:
```

	EMP	ID	AGE	sex
0	Dale	123	35	Male
1	Mark	143	40	Male

iv) DATAFRAME SORT FUNCTIONS

```
#DATAFRAME SORT FUNCTIONS

print("\nDataFrame sort functions:\n")
info= pd.DataFrame(np.random.randn(5,2), index=[3,2,0,4,1], columns=[ 'col3', 'col4'])
print(info)
info2 = info.sort_index()
print('\nSort index:\n',info2)
info3 = info.sort_values(by='col3')
print("\nSort Values:\n", info3)
```

OUTPUT:

DataFrame sort functions:

	col3	col4
3	-0.023617	-0.118871
2	0.842075	-0.148991
0	-1.479072	0.316568
4	-0.987557	1.520186
1	0.336717	0.389722

Sort index:

	col3	col4
0	-1.479072	0.316568
1	0.336717	0.389722
2	0.842075	-0.148991
3	-0.023617	-0.118871
4	-0.987557	1.520186

Sort Values:

	col3	col4
0	-1.479072	0.316568
4	-0.987557	1.520186
3	-0.023617	-0.118871
1	0.336717	0.389722
2	0.842075	-0.148991

v) DATAFRAME MERGE FUNCTION

```
#DATAFRAME MERGE FUNCTION

print("\nDataFrame Merge Functions:\n")
left = pd.DataFrame({'id':[1,2,3,4,5],
                     'Name':['Alex','Amy','Allen','Alice','Ayoung'],
                     'Sub':['Sub1','Sub2','Sub4','Sub6','Sub5']})
right = pd.DataFrame({'id':[1,2,3,4,5],
                      'Name':['Billy','Brian','Bran','Bryce','Betty'],
                      'Sub':['Sub2','Sub4','Sub3','Sub6','Sub5']})

print(left)
print('\n',right)
print('\n',pd.merge(left,right,on='id'))
```

OUTPUT:

3	4	Alice	Sub6
4	5	Ayoung	Sub5

	id	Name	Sub
0	1	Billy	Sub2
1	2	Brian	Sub4
2	3	Bran	Sub3
3	4	Bryce	Sub6
4	5	Betty	Sub5

DataFrame Merge Functions:

	id	Name	Sub
0	1	Alex	Sub1
1	2	Amy	Sub2
2	3	Allen	Sub4

	id	Name_x	Sub_x	Name_y	Sub_y
0	1	Alex	Sub1	Billy	Sub2
1	2	Amy	Sub2	Brian	Sub4
2	3	Allen	Sub4	Bran	Sub3
3	4	Alice	Sub6	Bryce	Sub6
4	5	Ayoung	Sub5	Betty	Sub5

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PANDAS SERIES

Aim:

To perform Pandas Series

Description:

1. Create Series from array
2. Create Series from dictionary
3. Create Series using scalar value
4. Create Series using index
5. Know the size, dimension, shape and index of Series

Programs:

i) CREATING SERIES FROM ARRAY

```
import pandas as pd
import numpy as np
#Creating Series from Array
arr=np.array(['p','a','n','d','a','s'])
a=pd.Series(arr)
print(a)
```

OUTPUT:

```
0    p
1    a
2    n
3    d
4    a
5    s
dtype: object
```

ii) CREATING SERIES FROM DICTIONARY

```
#Series from dictionary
arr={'x':0.,'y':1.,'z':2.}
b=pd.Series(arr)
print("\n\nSeries from dictionary:\n")
print(b)
```

OUTPUT:

```
Series from dictionary:
```

```
x    0.0
y    1.0
z    2.0
dtype: float64
```

iii) CREATING SERIES USING SCALAR

```
#Series using scalar
x=pd.Series(4,index=[0,1,2,3])
print("\nSeries using scalar\n")
print(x)
```

OUTPUT:

```
Series using scalar
```

```
0    4
1    4
2    4
3    4
dtype: int64
```

RESULT:

This program was executed