# PANDAS

**Ex.No. :2**

**Date :**

**AIM:**

To perform series and dataframe in pandas

**SOFTWARE USED:**

Jupyter notebook

## PANDAS-BASIC

**DESCRIPTION:**

1. Create an empty dataframe.
2. Convert a series to dataframe.
3. Extracting one column.
4. Adding and deleting a column.
5. Extracting second row.
6. Slice rows.
7. Adding a new row.
8. Deleting an existing row.

**PROGRAM:**

```
import pandas as pd

df=pd.DataFrame()

print(df)
```

```
import pandas as pd

emp=pd.Series(['Uma','Siva','Sindhu','Rair'])

id=pd.Series([10,20,30,40])

frame={'Emp':emp,'ID':id}

result=pd.DataFrame(frame)

print("\nSeries to Data Frame:\n")

print(result)
```

```
import pandas as pd
emp=pd.Series(['Uma','Siva','Sindhu','Rair'])
id=pd.Series([10,20,30,40])
frame={'Emp':emp,'ID':id}
r=pd.DataFrame(frame)
print("\nExtracting One Column\n")
print(r['Emp'])
```

```
import pandas as pd
emp=pd.Series(['Uma','Siva','Sindhu','Rair'])
id=pd.Series([10,20,30,40])
frame={'Emp':emp,'ID':id}
r=pd.DataFrame(frame)
print("\nAddind a new column\n")
r['Age']=pd.Series([20,25,30,50])
print(r)
print("\nDeleting an existing column\n")
del r['Age']
print(r)
```

```
import pandas as pd
emp=pd.Series(['Uma','Siva','Sindhu','Rair'])
id=pd.Series([10,20,30,40])
frame={'Emp':emp,'ID':id}
r=pd.DataFrame(frame)
print("\nExtracting second Row\n")
print(r.loc[1])
```

```
import pandas as pd
emp=pd.Series(['Uma','Siva','Sindhu','Rair'])
id=pd.Series([10,20,30,40])
```

```
frame={'Emp':emp,'ID':id}
r=pd.DataFrame(frame)
print("Slice rows:\n",r[1:3])

import pandas as pd
emp=pd.Series(['Uma','Siva','Sindhu','Rair'])
id=pd.Series([10,20,30,40])
frame={'Emp':emp,'ID':id}
r=pd.DataFrame(frame)
d2=pd.DataFrame([["Anu",20],["jinu",19]],columns=['Emp','ID'])
print("\nAdding new row values\n",pd.concat([r,d2]))

import pandas as pd
emp=pd.Series(['Uma','Siva','Sindhu','Rair'])
id=pd.Series([10,20,30,40])
frame={'Emp':emp,'ID':id}
r=pd.DataFrame(frame)
print("\nDelete an existing row\n")
print(r.drop(2)
```

**OUTPUT:**

```
Empty DataFrame
Columns: []
Index: []

Series to Data Frame:
     Emp  ID
0  Uma     10
1  Siva      20
2  Sindhu  30
3  Rair      40
Extracting One Column
```

0 Uma

1 Siva

2 Sindhu

3 Rair

Name: Emp, dtype: object

Addind a new column

| | Emp | ID | Age |
|---|---|---|---|
| 0 | Uma | 10 | 20 |
| 1 | Siva | 20 | 25 |
| 2 | Sindhu | 30 | 30 |
| 3 | Rair | 40 | 50 |

Deleting an existing column

| | Emp | ID |
|---|---|---|
| 0 | Uma | 10 |
| 1 | Siva | 20 |
| 2 | Sindhu | 30 |
| 3 | Rair | 40 |

Extracting second Row

Emp Siva

ID 20

Name: 1, dtype: object

Slice rows:

| | Emp | ID |
|---|---|---|
| 1 | Siva | 20 |
| 2 | Sindhu | 30 |

Adding new row values

```
      Emp  ID
0     Uma   10
1    Siva    20
2  Sindhu  30
3    Rair    40
0     Anu    20
1    jinu    19
```

Delete an existing row

```
   Emp  ID
0  Uma  10
1  Siva   20
3  Rair   40
```

## PANDAS-DATAFRAME FUNCTION

**DESCRIPTION:**

1. Square root of data frame.
2. Sum of row and column.
3. Min and Max function.
4. Adding new row and column.
5. Sorting column by index and value.
6. Merging two data frame.

**PROGRAM :**

```
import numpy as np
import pandas as pd
info=pd.DataFrame([[3,9]]*4,columns=['S','R'])
print("\nOriginal Dataframe:\n",info)
print("\nSquare root:\n",info.apply(np.sqrt))
print("\nSum of each column:\n",info.apply(np.sum,axis=0))
print("\nSum of each row:\n",info.apply(np.sum,axis=1))
```

```
import numpy as np
import pandas as pd
info=pd.DataFrame([[2,4,6],[1,3,5],[5,8,7]],columns=['X','Y','Z'])
print(info)
print(info.agg(['min','max']))

import pandas as pd
import numpy as np
d2=pd.DataFrame([['Sai',88],["Poo",70]],columns=['EmpName','ID'])
print(d2)
d2['Age']=[20,18]
print("\n Adding a new column:\n",d2)
d2['Sex']=['Male','Male']
print("\n Addind a new column:\n",d2)

import pandas as pd
import numpy as np
a=pd.DataFrame([['Sai',88],['Poo',70]],columns=['EmpName','ID'])
print(a)
b=a.assign(Age=[20,18])
print(b)

import pandas as pd
info=pd.DataFrame(np.random.randn(5, 2),index=[3,2,0,4,1],columns=['col3','col4'])
print(info)
info2=info.sort_index()
print(info2)
info3=info.sort_values(by='col4')
print(info3)
```

```
import numpy as np
import pandas as pd
left=pd.DataFrame({'id':[1,2,3,4],'Name':['Sai','Poo','Saba','Yuvi'],'Sub':['sub1','sub2','sub4','sub3']})
right=pd.DataFrame({'id':[1,2,3,4],'Name':['Sanjay','Saran','Som','Ruba'],'sub':['sub2','sub4','sub3','sub5']})
print(left)
print(right)
print(pd.merge(left,right,on='id'))
```

**OUTPUT:**

Original Dataframe:

```
   S  R
0  3  9
1  3  9
2  3  9
3  3  9
```

Square root:

```
         S    R
0  1.732051  3.0
1  1.732051  3.0
2  1.732051  3.0
3  1.732051  3.0
```

Sum of each column:

```
S    12
R    36
dtype: int64
```

Sum of each row:

0 12

1 12

2 12

3 12

dtype: int64

| | X | Y | Z |
|---|---|---|---|
| 0 | 2 | 4 | 6 |
| 1 | 1 | 3 | 5 |
| 2 | 5 | 8 | 7 |

| | X | Y | Z |
|---|---|---|---|
| min | 1 | 3 | 5 |
| max | 5 | 8 | 7 |

| | EmpName | ID |
|---|---|---|
| 0 | Sai | 88 |
| 1 | Poo | 70 |

Adding a new column:

| | EmpName | ID | Age |
|---|---|---|---|
| 0 | Sai | 88 | 20 |
| 1 | Poo | 70 | 18 |

Addind a new column:

| | EmpName | ID | Age | Sex |
|---|---|---|---|---|
| 0 | Sai | 88 | 20 | Male |
| 1 | Poo | 70 | 18 | Male |

| | EmpName | ID |
|---|---|---|
| 0 | Sai | 88 |
| 1 | Poo | 70 |

| | EmpName | ID | Age |
|---|---|---|---|
| 0 | Sai | 88 | 20 |
| 1 | Poo | 70 | 18 |

| | col3 | col4 |
|---|---|---|
| 3 | -0.663592 | 2.491994 |
| 2 | -0.164609 | 0.857035 |
| 0 | 1.161227 | -0.429527 |
| 4 | -0.358437 | 1.081599 |
| 1 | 0.745594 | 0.764001 |

| | col3 | col4 |
|---|---|---|
| 0 | 1.161227 | -0.429527 |
| 1 | 0.745594 | 0.764001 |
| 2 | -0.164609 | 0.857035 |
| 3 | -0.663592 | 2.491994 |
| 4 | -0.358437 | 1.081599 |

| | col3 | col4 |
|---|---|---|
| 0 | 1.161227 | -0.429527 |
| 1 | 0.745594 | 0.764001 |
| 2 | -0.164609 | 0.857035 |
| 4 | -0.358437 | 1.081599 |
| 3 | -0.663592 | 2.491994 |

| | id | Name | Sub |
|---|---|---|---|
| 0 | 1 | Sai | sub1 |
| 1 | 2 | Poo | sub2 |
| 2 | 3 | Saba | sub4 |
| 3 | 4 | Yuvi | sub3 |

| | id | Name | sub |
|---|---|---|---|
| 0 | 1 | Sanjay | sub2 |
| 1 | 2 | Saran | sub4 |
| 2 | 3 | Som | sub3 |
| 3 | 4 | Ruba | sub5 |

| | id | Name_x | Sub | Name_y | sub |
|---|---|---|---|---|---|
| 0 | 1 | Sai | sub1 | Sanjay | sub2 |
| 1 | 2 | Poo | sub2 | Saran | sub4 |
| 2 | 3 | Saba | sub4 | Som | sub3 |
| 3 | 4 | Yuvi | sub3 | Ruba | sub5 |

# PANDAS-SERIES

**DESCRIPTION:**

1. Array to series.
2. Indexing.
3. Creating a series with index.
4. Fetching properties of series dataframe.

**PROGRAM :**

```
import pandas as pd

import numpy as np

a=np.array([‘k','i','s','h','o',’r’,’e’])

a=pd.Series(a)

print(a)
```

```
import pandas as pd

import numpy as np

a=np.array(['s',’a',’m'])

print(a)
```

```
import pandas as pd

import numpy as np

a={'a':0,'b':1,'c':2}

a=pd.Series(a)

print(a)
```

```
import numpy as np

import pandas as pd

a=pd.Series(4,index=[0,1,2,3])

print(a)
```

```
import numpy as np
import pandas as pd
a=np.array(['k','i','s','h','o', 'r','e'])
a=pd.Series(a)
print("\nA Series:\n",a)
print("\nIndex:\n",a.index)
print("\nValues:\n",a.values)
print("\nShape:\n",a.shape)
print("\nDimension:\n",a.ndim)
print("\nSize:\n",a.size)
```

**OUTPUT:**

```
0  k
1  i
2  s
3  h
4  o
5  r
6  e

dtype: object

['s' 'a' 'm']

a  0
b  1
c  2
dtype: int64

0  4
1  4
```

2 4

3 4

dtype: int64

A Series:

0 k

1 i

2 s

3 h

4 o

5 r

6 e

dtype: object

Index:

RangeIndex(start=0, stop=8, step=1)

Values:

['k' 'i' 's' 'h' 'o' 'r' 'e' ]

Shape:

(8,)

Dimension:

1

Size:

8

**RESULT:**

Thus various operations are performed using pandas series and data frame.