In [1]:
```
import pandas as pd
import numpy as np
```

In [2]:
```
a = [1,2,3,4,5,6,7,'nikhil','hero']
print(a)
print(type(a))
```

```
[1, 2, 3, 4, 5, 6, 7, 'nikhil', 'hero']
<class 'list'>
```

In [3]:
```
a = np.array([1,2,3,4,5,6,7,'nikhil','hero'])
print(a)
print(type(a))
```

```
['1' '2' '3' '4' '5' '6' '7' 'nikhil' 'hero']
<class 'numpy.ndarray'>
```

Pandas Series

In [4]:
```
a = pd.Series([1,2,3,4,5,6,7,'nikhil','hero'])
print(a)
print(type(a))
```

```
0         1
1         2
2         3
3         4
4         5
5         6
6         7
7    nikhil
8      hero
dtype: object
<class 'pandas.core.series.Series'>
```

In [5]:
```
a = pd.Series([1,2,3,4,'nikhil','hero'],index=[
    'a','b','c','d','e','f'
])
print(a)
print(type(a))
```

```
a         1
b         2
c         3
d         4
e    nikhil
f      hero
dtype: object
<class 'pandas.core.series.Series'>
```

In [6]:
```
a = pd.Series([1,2,3,4,5],index=[
    'a','b','c','d','e'
], dtype=float)
```



```
print(a)
print(type(a))
```

```
a    1.0
b    2.0
c    3.0
d    4.0
e    5.0
dtype: float64
<class 'pandas.core.series.Series'>
```

In [7]:
```
a = pd.Series([1,2,3,4,5],index=[
    'a','b','c','d','e'
], dtype=float, name='xyz')
print(a)
print(type(a))
```

```
a    1.0
b    2.0
c    3.0
d    4.0
e    5.0
Name: xyz, dtype: float64
<class 'pandas.core.series.Series'>
```

In [8]:
```
a = pd.Series(index=[
    'a','b','c','d','e'
], name='xyz')
print(a)
print(type(a))
```

```
a   NaN
b   NaN
c   NaN
d   NaN
e   NaN
Name: xyz, dtype: float64
<class 'pandas.core.series.Series'>
```

In [9]:
```
a = pd.Series(5.2,index=[
    'a','b','c','d','e'
], name='xyz')
print(a)
print(type(a))
```

```
a    5.2
b    5.2
c    5.2
d    5.2
e    5.2
Name: xyz, dtype: float64
<class 'pandas.core.series.Series'>
```

In [10]:
```
s1 = pd.Series({'a':'ravi teja','b':'allu arjun','c':'mahesh babu','d':'chiranjeevi
s1
```

Out[10]:
```
a      ravi teja
b     allu arjun
c    mahesh babu
d    chiranjeevi
dtype: object
```

Indexing and Slicing

In [12]:
```
a = pd.Series([1,2,3,4,5],index=[
    'a','b','c','d','e'
], dtype=float, name='xyz')
print(a)
print(type(a))
```

```
a    1.0
b    2.0
c    3.0
d    4.0
e    5.0
Name: xyz, dtype: float64
<class 'pandas.core.series.Series'>
```

In [31]:
```
print(a['d'])
print(a.e)
```

```
4.0
5.0
```

In [33]:
```
print(a['c':'f'])
```

```
c    3.0
d    4.0
e    5.0
Name: xyz, dtype: float64
```

In [37]:
```
print(a.max())
print(a.min())
```

```
5.0
1.0
```

In [49]:
```
s1 = pd.Series(dict([(i,v) for i,v in zip('abcdefgh',np.arange(1,9))]))
s2 = pd.Series(dict([(i,v) for i,v in zip('abcdefgh',np.arange(11,19))]))
```

In [51]:
```
s1
```

Out[51]:
```
a    1
b    2
c    3
d    4
e    5
f    6
g    7
h    8
dtype: int64
```


In [53]:
```
s2
```

Out[53]:
```
a    11
b    12
c    13
d    14
e    15
f    16
g    17
h    18
dtype: int64
```

In [55]:
```
s1 + s2
```

Out[55]:
```
a    12
b    14
c    16
d    18
e    20
f    22
g    24
h    26
dtype: int64
```

DataFrame

In [67]:
```
d1 = pd.DataFrame([i for i in range(1,5)])
s1 = pd.Series([i for i in range(1,5)])
print('Series')
s1
```

```
Series
```

Out[67]:
```
0    1
1    2
2    3
3    4
dtype: int64
```

In [69]:
```
print('DataFrame')
d1
```

```
DataFrame
```

Out[69]:

	0
0	1
1	2
2	3
3	4

In [71]:
```
df = pd.DataFrame([[1,2,3,4,5,6],[3,2,1,4,5,6],[4,5,2,1,3,6],[1,2,4,5,6,3]])
```

```
df
```

Out[71]:

	0	1	2	3	4	5
0	1	2	3	4	5	6
1	3	2	1	4	5	6
2	4	5	2	1	3	6
3	1	2	4	5	6	3

In [75]:

```
df = pd.DataFrame({'f1':[1,2,3,4,5,6],
                   'f2':[3,2,1,4,5,6],
                   'f3':[4,5,2,1,3,6],
                   'f4':[1,2,4,5,6,3]})
df
```

Out[75]:

	f1	f2	f3	f4
0	1	3	4	1
1	2	2	5	2
2	3	1	2	4
3	4	4	1	5
4	5	5	3	6
5	6	6	6	3

In [77]:

```
df = pd.DataFrame([{'f1':[1,2,3,4,5,6],
                    'f2':[3,2,1,4,5,6],
                    'f3':[4,5,2,1,3,6],
                    'f4':[1,2,4,5,6,3]}])
df
```

Out[77]:

	f1	f2	f3	f4
0	[1, 2, 3, 4, 5, 6]	[3, 2, 1, 4, 5, 6]	[4, 5, 2, 1, 3, 6]	[1, 2, 4, 5, 6, 3]

In [79]:

```
df = pd.DataFrame([[1,2,3,4,5,6],[3,2,1,4,5,6],[4,5,2,1,3,6],[1,2,4,5,6,3]],
                  columns=['f1','f2','f3','f4','f5','f6'])
df
```


Out[79]:

	f1	f2	f3	f4	f5	f6
0	1	2	3	4	5	6
1	3	2	1	4	5	6
2	4	5	2	1	3	6
3	1	2	4	5	6	3

In [95]:

```
## Exercise

fdf = pd.DataFrame(np.linspace(1,3,25, dtype=int).reshape(5,5),
                   columns=[f'{v}{i}' for i,v in enumerate('fffff')])
fdf
```

Out[95]:

	f0	f1	f2	f3	f4
0	1	1	1	1	1
1	1	1	1	1	1
2	1	1	2	2	2
3	2	2	2	2	2
4	2	2	2	2	3

In [99]:

```
fmat = pd.DataFrame({
    'id':[i for i in range(101,108)],
    'name':['ram','kapil','riya','megha','saket','aman','pranay'],
    'per':[45,67,89,34,56,78,99]
})
fmat
```

Out[99]:

	id	name	per
0	101	ram	45
1	102	kapil	67
2	103	riya	89
3	104	megha	34
4	105	saket	56
5	106	aman	78
6	107	pranay	99

In [103…

```
tv = pd.DataFrame({
    'Grade':['a+','b+','b+','a++','c','d','a++']
})
tv
```

Out[103…

	Grade
0	a+
1	b+
2	b+
3	a++
4	c
5	d
6	a++

Methods to combine two data frames

In [105…
```
pd.concat([fmat,tv],axis=1)
```

Out[105…

	id	name	per	Grade
0	101	ram	45	a+
1	102	kapil	67	b+
2	103	riya	89	b+
3	104	megha	34	a++
4	105	saket	56	c
5	106	aman	78	d
6	107	pranay	99	a++

In [109…
```
fmat['grade'] = tv
fmat
```

Out[109…

	id	name	per	grade
0	101	ram	45	a+
1	102	kapil	67	b+
2	103	riya	89	b+
3	104	megha	34	a++
4	105	saket	56	c
5	106	aman	78	d
6	107	pranay	99	a++

In [111…
```
fmat[5] = tv
fmat
```

Out[111…

	id	name	per	grade	5
0	101	ram	45	a+	a+
1	102	kapil	67	b+	b+
2	103	riya	89	b+	b+
3	104	megha	34	a++	a++
4	105	saket	56	c	c
5	106	aman	78	d	d
6	107	pranay	99	a++	a++

In [114…
```
fmat[4] = tv
fmat
```

Out[114…

	id	name	per	grade	5	4
0	101	ram	45	a+	a+	a+
1	102	kapil	67	b+	b+	b+
2	103	riya	89	b+	b+	b+
3	104	megha	34	a++	a++	a++
4	105	saket	56	c	c	c
5	106	aman	78	d	d	d
6	107	pranay	99	a++	a++	a++

In [ ]: