In [3]:
```python
import numpy as np
import pandas as pd
```

In [5]:
```python
df=pd.DataFrame()
```

In [7]:
```python
df
```

Out[7]: —

In [9]:
```python
a1=np.array([10,20,30])
a2=np.array([100,200,300])
a3=np.array([-10,-20,30,40])
```

In [15]:
```python
df1=pd.DataFrame(a1)
```

In [17]:
```python
df1
```

Out[17]:

	0
0	10
1	20
2	30

In [25]:
```python
df2=pd.DataFrame([a1,a2,a3],columns=['a','b','c','d'])
```

In [21]:
```python
df2
```

Out[21]:

	a	b	c	d
0	10	20	30	NaN
1	100	200	300	NaN
2	-10	-20	30	40.0

In [27]:
```python
listdict=[{'a':10,'b':20},{'a':5,'b':10,'c':15}]
```

In [29]:
```python
df3=pd.DataFrame(listdict)
```

In [31]:
```python
df3
```

Out[31]:

	a	b	c
0	10	20	NaN
1	5	10	15.0

In [33]:
```python
dicoflist={'State':['Assam','Delhi','Kerala'], 'Area':[2344,4545,5445],'Pop':[3,4,2]}
```

In [35]:
```python
df3=pd.DataFrame(dicoflist)
```

In [37]:
```python
df3
```

Out[37]:

	State	Area	Pop
0	Assam	2344	3
1	Delhi	4545	4
2	Kerala	5445	2

In [39]:
```python
sA=pd.Series([1,2,3,4,5],index=['a','b','c','d','e'])
```

In [41]:
```python
sA
```

Out[41]:
```
a    1
b    2
c    3
d    4
e    5
dtype: int64
```

In [45]:
```python
sB=pd.Series([100,200,300,400,-500],index=['a','b','c','d','e'])
```

In [47]:
```python
sB
```

Out[47]:
```
a    100
b    200
c    300
d    400
e   -500
dtype: int64
```

In [49]:
```python
sC=pd.Series([10,20,-3000,400,-500],index=['a','b','c','d','e'])
```

In [51]:
```python
sC
```

Out[51]:
```
a      10
b      20
c   -3000
d     400
e    -500
dtype: int64
```

In [53]:
```python
df4=pd.DataFrame(sA)
```

In [55]:
```python
df4
```

Out[55]:

	0
a	100
b	200
c	300
d	400
e	-500

In [57]:
```python
df5=pd.DataFrame(sB)
```

In [59]:
```python
df5
```

Out[59]:

	0
a	100
b	200
c	300
d	400
e	-500

In [61]:
```python
df6=pd.DataFrame(sC)
```

In [63]:
```python
df6
```

Out[63]:

	0
a	10
b	20
c	-3000
d	400
e	-500

In [71]:
```python
df7=pd.DataFrame([sA,sB,sC])
```

In [73]:
```python
df7
```

Out[73]:

	a	b	c	d	e
0	100	200	300	400	-500
1	100	200	300	400	-500
2	10	20	-3000	400	-500

In [77]:
```python
from numpy.random import randn
np.random.seed(101)
```

In [79]:
```python
df8=pd.DataFrame(randn(5,4),index='A B C D E'.split(), columns='W X Y Z'.split())
```

In [81]:
```python
df8
```

Out[81]:

	W	X	Y	Z
A	2.706850	0.628133	0.907969	0.503826
B	0.651118	-0.319318	-0.848077	0.605965
C	-2.018168	0.740122	0.528813	-0.589001
D	0.188695	-0.758872	-0.933237	0.955057
E	0.190794	1.978757	2.605967	0.683509

In [83]:
```python
#indexing
```

In [87]:
```python
df8['W']
```

Out[87]:
```
A    2.706850
B    0.651118
C   -2.018168
D    0.188695
E    0.190794
Name: W, dtype: float64
```

In [91]:
```python
df8[['W','Z']]
```

Out[91]:

	W	Z
A	2.706850	0.503826
B	0.651118	0.605965
C	-2.018168	-0.589001
D	0.188695	0.955057
E	0.190794	0.683509

In [93]:
```python
df8.W
```

Out[93]:
```
A    2.706850
B    0.651118
C   -2.018168
D    0.188695
E    0.190794
Name: W, dtype: float64
```

In [105...
```python
type(df8['W'])
```

Out[105...
```
pandas.core.series.Series
```

In [107...
```python
df8['new']=df8['W']+df8['Y']
```

Out[107...
```
A    3.614819
B   -0.196959
C   -1.489355
D   -0.744542
E    2.796762
Name: new, dtype: float64
```

In [109...
```python
df8
```

Out[109...

	W	X	Y	Z	new
A	2.706850	0.628133	0.907969	0.503826	3.614819
B	0.651118	-0.319318	-0.848077	0.605965	-0.196959
C	-2.018168	0.740122	0.528813	-0.589001	-1.489355
D	0.188695	-0.758872	-0.933237	0.955057	-0.744542
E	0.190794	1.978757	2.605967	0.683509	2.796762

In [119...
```python
df8.drop('new',axis=1,inplace=True)
```

In [121...
```python
df8
```

Out[121...

	W	X	Y	Z
A	2.706850	0.628133	0.907969	0.503826
B	0.651118	-0.319318	-0.848077	0.605965
C	-2.018168	0.740122	0.528813	-0.589001
D	0.188695	-0.758872	-0.933237	0.955057
E	0.190794	1.978757	2.605967	0.683509

In [123...
```python
df8.drop('E',axis=0,inplace=True)
```

In [125...
```python
df8
```

Out[125...

	W	X	Y	Z
A	2.706850	0.628133	0.907969	0.503826
B	0.651118	-0.319318	-0.848077	0.605965
C	-2.018168	0.740122	0.528813	-0.589001
D	0.188695	-0.758872	-0.933237	0.955057

In [133...
```python
df8.loc['A']
```

Out[133...
```
W    2.706850
X    0.628133
Y    0.907969
Z    0.503826
Name: A, dtype: float64
```

In [135...
```python
df8.iloc[2]
```

Out[135...
```
W   -2.018168
X    0.740122
Y    0.528813
Z   -0.589001
Name: C, dtype: float64
```

In [137...
```python
df8.loc['B','Y']
```

Out[137...
```
-0.8480769834036315
```

In [139...
```python
df8.loc[['A','B'],['W','Y']]
```

Out[139...

	W	Y
A	2.706850	0.907969
B	0.651118	-0.848077

In [141...
```python
df8
```

Out[141...

	W	X	Y	Z
A	2.706850	0.628133	0.907969	0.503826
B	0.651118	-0.319318	-0.848077	0.605965
C	-2.018168	0.740122	0.528813	-0.589001
D	0.188695	-0.758872	-0.933237	0.955057

In [145...
```python
df8>0
```

Out[145...

	W	X	Y	Z
A	True	True	True	True
B	True	False	False	True
C	False	True	True	False
D	True	False	False	True

In [147...
```python
df8[df8>0]
```

Out[147...

	W	X	Y	Z
A	2.706850	0.628133	0.907969	0.503826
B	0.651118	NaN	NaN	0.605965
C	NaN	0.740122	0.528813	NaN
D	0.188695	NaN	NaN	0.955057

In [213...
```python
Result={'Abc': pd.Series([90, 91, 97],index=['Maths','Science','Hindi']),
        'Rdf': pd.Series([92, 81, 96],index=['Maths','Science','Hindi']),
        'Sfd': pd.Series([89, 91, 88],index=['Maths','Science','Hindi']),
        'Rfe': pd.Series([81, 71, 67], index=['Maths','Science','Hindi']),
        'Mla': pd.Series([94, 95, 99],index=['Maths','Science','Hindi'])}
```

In [215...
```python
df9=pd.DataFrame(Result)
```

In [219...
```python
df9
```

Out[219...

	Abc	Rdf	Sfd	Rfe	Mla
Maths	90	92	89	81	94
Science	91	81	91	71	95
Hindi	97	96	88	67	99

In [221...
```python
type(df9)
```

Out[221...
```
pandas.core.frame.DataFrame
```

In [233...
```python
type(df9.Abc)
```

Out[233...
```
pandas.core.series.Series
```

In [225...
```python
dictForUnion = { 'Series1' :pd.Series([1,2,3,4,5],index =['a', 'b', 'c', 'd', 'e']) ,
 'Series2' : pd.Series([10,20,-10,-50,100], index = ['z', 'y', 'a', 'c', 'e']),
 'Series3' : pd.Series([10,20,-10,-50,100], index = ['z', 'y', 'a', 'c', 'e']) }
```

In [227...
```python
df10 = pd.DataFrame(dictForUnion)
```

In [229...
```python
df10
```

Out[229...

	Series1	Series2	Series3
a	1.0	-10.0	-10.0
b	2.0	NaN	NaN
c	3.0	-50.0	-50.0
d	4.0	NaN	NaN
e	5.0	100.0	100.0
y	NaN	20.0	20.0
z	NaN	10.0	10.0

In [243...
```python
df=pd.DataFrame(randn(5,4),index='A B C D E'.split(), columns='W X Y Z'.split())
```

In [245...
```python
df
```

Out[245...

	W	X	Y	Z
A	-0.993263	0.196800	-1.136645	0.000366
B	1.025984	-0.156598	-0.031579	0.649826
C	2.154846	-0.610259	-0.755325	-0.346419
D	0.147027	-0.479448	0.558769	1.024810
E	-0.925874	1.862864	-1.133817	0.610478

In [253...
```python
df[df['W']>0][['Y','X']]
```

Out[253...

	Y	X
B	-0.031579	-0.156598
C	-0.755325	-0.610259
D	0.558769	-0.479448

In [257...
```python
df[(df['W']>0)&(df['Y']>0)]
```

Out[257...

	W	X	Y	Z
D	0.147027	-0.479448	0.558769	1.02481

In [259...
```python
df
```

Out[259...

	W	X	Y	Z
A	-0.993263	0.196800	-1.136645	0.000366
B	1.025984	-0.156598	-0.031579	0.649826
C	2.154846	-0.610259	-0.755325	-0.346419
D	0.147027	-0.479448	0.558769	1.024810
E	-0.925874	1.862864	-1.133817	0.610478

In [261...
```python
df.reset_index()
```

Out[261...

	index	W	X	Y	Z
0	A	-0.993263	0.196800	-1.136645	0.000366
1	B	1.025984	-0.156598	-0.031579	0.649826
2	C	2.154846	-0.610259	-0.755325	-0.346419
3	D	0.147027	-0.479448	0.558769	1.024810
4	E	-0.925874	1.862864	-1.133817	0.610478

In [263...
```python
newindex='R S T U V'.split()
```

In [265...
```python
df['New']=newindex
```

In [267...
```python
df
```

Out[267...

	W	X	Y	Z	New
A	-0.993263	0.196800	-1.136645	0.000366	R
B	1.025984	-0.156598	-0.031579	0.649826	S
C	2.154846	-0.610259	-0.755325	-0.346419	T
D	0.147027	-0.479448	0.558769	1.024810	U
E	-0.925874	1.862864	-1.133817	0.610478	V

In [273...
```python
df.set_index('New', inplace=True)
```

In [275...
```python
df
```

Out[275...

	W	X	Y	Z
New				
R	-0.993263	0.196800	-1.136645	0.000366
S	1.025984	-0.156598	-0.031579	0.649826
T	2.154846	-0.610259	-0.755325	-0.346419
U	0.147027	-0.479448	0.558769	1.024810
V	-0.925874	1.862864	-1.133817	0.610478