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

In [2]:
```
#import Pandas library
import pandas as pd
```

Pandas Series

1. Create Series using List

In [3]:
```
l=['banana', 42]

s = pd.Series(l)
print(s)
```

```
0    banana
1        42
dtype: object
```

In [4]:
```
s = pd.Series(l, index=['a','b'])
print(s)
```

```
a    banana
b        42
dtype: object
```

2. Create Series using Array

In [5]:
```
a=np.array(l)

s = pd.Series(a, index=['a','b'])
print(s)
```

```
a    banana
b        42
dtype: object
```

3. Create Series using Dictionary

In [6]:
```
d = {'a': 1,'b': 2,'c': 3}
s = pd.Series(d)
s
```

Out[6]:
```
a    1
b    2
c    3
dtype: int64
```

In [7]:
```
d = {'a': 1,'b': 2,'c': 3}
s = pd.Series(d, index=['a','c'])
s
```

Out[7]:
```
a    1
c    3
dtype: int64
```

In [8]:
```
d = {'col1': [1, 2], 'col2': [3, 4]}
df = pd.Series(d)
df
```

Out[8]:
```
col1    [1, 2]
col2    [3, 4]
dtype: object
```

Data Frame --> pandas.DataFrame

1. Create DataFrame using Dictionary

In [9]:
```
d = {'col1': [1, 2], 'col2': [3, 4]}
df = pd.DataFrame(d)
df
```

Out[9]:

	col1	col2
0	1	3
1	2	4

2. Create DataFrame using Nested List or 2D array

In [10]:
```
d=[[1,2,3],[4,5,6]]
df1 = pd.DataFrame(d,columns=["col1","col2","col3"])
df1
```

Out[10]:

	col1	col2	col3
0	1	2	3
1	4	5	6

3. Create DataFrame using 2D array

In [11]:
```
d=[[1,2,3],[4,5,6]]

data = np.array([[1,2,3],[4,5,6]])

df2 = pd.DataFrame(data,columns=["col1","col2","col3"])
df2
```

Out[11]:

	col1	col2	col3
0	1	2	3
1	4	5	6

Add a column

In [12]:
```
df2["col4"] =[120,160]
df2
```

Out[12]:

	col1	col2	col3	col4
0	1	2	3	120
1	4	5	6	160

In [13]:
```
temperature_df = pd.DataFrame({
"city": ["mumbai","delhi","banglore", 'hyderabad'],
"temperature": [32,45,40,36]})

temperature_df
```

Out[13]:

	city	temperature
0	mumbai	32
1	delhi	45
2	banglore	40
3	hyderabad	36

In [14]:
```
humidity_df = pd.DataFrame({
"city": ["delhi","mumbai","banglore","Chennai"],
"humidity": [68, 65, 75, 70]})

humidity_df
```

Out[14]:

	city	humidity
0	delhi	68
1	mumbai	65
2	banglore	75
3	Chennai	70

Combining Dataframes

option 1: **Append**

In [15]:
```
1 df = temperature_df.append(humidity_df)
2 df
```

```
C:\Users\ADMIN\AppData\Local\Temp\ipykernel_4124\2403508535.py:1: FutureWarnin
g: The frame.append method is deprecated and will be removed from pandas in a f
uture version. Use pandas.concat instead.
  df = temperature_df.append(humidity_df)
```

Out[15]:

	city	temperature	humidity
0	mumbai	32.0	NaN
1	delhi	45.0	NaN
2	banglore	40.0	NaN
3	hyderabad	36.0	NaN
0	delhi	NaN	68.0
1	mumbai	NaN	65.0
2	banglore	NaN	75.0
3	Chennai	NaN	70.0

option 2: **Concatenate**

In [16]:
```
1 df = pd.concat([temperature_df, humidity_df])
2 df
```

Out[16]:

	city	temperature	humidity
0	mumbai	32.0	NaN
1	delhi	45.0	NaN
2	banglore	40.0	NaN
3	hyderabad	36.0	NaN
0	delhi	NaN	68.0
1	mumbai	NaN	65.0
2	banglore	NaN	75.0
3	Chennai	NaN	70.0

In [17]:
```
df = pd.concat([temperature_df, humidity_df], ignore_index=True)
df
```

Out[17]:

	city	temperature	humidity
0	mumbai	32.0	NaN
1	delhi	45.0	NaN
2	banglore	40.0	NaN
3	hyderabad	36.0	NaN
4	delhi	NaN	68.0
5	mumbai	NaN	65.0
6	banglore	NaN	75.0
7	Chennai	NaN	70.0

In [18]:
```
df = pd.concat([temperature_df, humidity_df],axis=1)
df
```

Out[18]:

	city	temperature	city	humidity
0	mumbai	32	delhi	68
1	delhi	45	mumbai	65
2	banglore	40	banglore	75
3	hyderabad	36	Chennai	70

Merging of DataFrame

In [19]:
```
#Inner Join
df = pd.merge(temperature_df, humidity_df, on='city',how="inner")
df
```

Out[19]:

	city	temperature	humidity
0	mumbai	32	65
1	delhi	45	68
2	banglore	40	75

In [20]:
```
#Outer Join
df = pd.merge(temperature_df, humidity_df, on='city', how='outer')
df
```

Out[20]:

	city	temperature	humidity
0	mumbai	32.0	65.0
1	delhi	45.0	68.0
2	banglore	40.0	75.0
3	hyderabad	36.0	NaN
4	Chennai	NaN	70.0

In [21]:
```
#Left Join
df = pd.merge(temperature_df, humidity_df, on='city', how='left')
df
```

Out[21]:

	city	temperature	humidity
0	mumbai	32	65.0
1	delhi	45	68.0
2	banglore	40	75.0
3	hyderabad	36	NaN

In [22]:
```
#Right Join
df = pd.merge(temperature_df, humidity_df, on='city', how='right')
df
```

Out[22]:

	city	temperature	humidity
0	delhi	45.0	68
1	mumbai	32.0	65
2	banglore	40.0	75
3	Chennai	NaN	70