pandas:

```
                - pandas stands for 'python data analysis library'.
                *uses:
                        - It is open source library.
                        - It one of the data science library.
                        - It is mainly used for data analysis and data cleaning.
                        - It deals with Two different data structures.
                            -> Series->sequence of data (1-d array)
                            -> DataFrame->Combination of rows and columns(2-d arra
        y)
                        - we can import pandas
```

In [1]:
```python
import pandas as pd
```

Series:
```
                - from list and numpy array.
                - from dictionary
                - syntax: pd.Series(list or numpy array or dictionary)
```

In [2]:
```python
# creation of series data structure using list..
L1 = [10,20,30,40]
sd = pd.Series(L1)
print(sd)
```

```
0    10
1    20
2    30
3    40
dtype: int64
```

In [3]:
```python
# To change the index values in series data structure..
sd.index = ['A','B','C','D']
sd
```

Out[3]:
```
A    10
B    20
C    30
D    40
dtype: int64
```

```
In [4]:  sd1 = pd.Series(['pvkk','mvgr','svit'],index = ['I','II','III'])
         sd1
```

```
Out[4]:  I       pvkk
         II      mvgr
         III     svit
         dtype: object
```

```
In [5]:  # To access the series data structure value using index name..
         sd1['I']
```

```
Out[5]:  'pvkk'
```

```
In [6]:  # updation of series data structure value..
         sd1['I'] = 'JNTUA'
         sd1
```

```
Out[6]:  I       JNTUA
         II       mvgr
         III      svit
         dtype: object
```

```
In [8]:  # creation of series data structure using numpy array..
         import numpy as np
         a1 = np.array([10,20,30,20])
         sd3 = pd.Series(a1)
         sd3
```

```
Out[8]:  0     10
         1     20
         2     30
         3     20
         dtype: int32
```

```
In [9]:  # creation of series data struccture using dictionary..
         student = {'Name':'aadyan','Rollno':510,'branch':'CSE'}
         sd4 = pd.Series(student)
         sd4
```

```
Out[9]:  Name        aadyan
         Rollno         510
         branch         CSE
         dtype: object
```

In [12]:
```python
# To delete the specific value..
sd4 = sd4.drop(labels=['Name'])
print(sd4)
```

```
Rollno    510
branch    CSE
dtype: object
```

In [13]:
```python
sd4
```

Out[13]:
```
Rollno    510
branch    CSE
dtype: object
```

In [15]:
```python
sd3
```

Out[15]:
```
0    10
1    20
2    30
3    20
dtype: int32
```

In [16]:
```python
sd3 = sd3.drop(labels=[0,3])
sd3
```

Out[16]:
```
1    20
2    30
dtype: int32
```

DataFrame:

```
- from dictionary
- from numpy 2-d array
```

In [17]:
```python
# creation of dataframe using dictionary..
student_data = {'Rollno':[210,340,510],'Name':['raju','Aadyan','Aaryan'],
                'Branch':['CSE','MECH','EEE'],'maths':[45,30,27]}
df = pd.DataFrame(student_data)
df
```

Out[17]:

	Rollno	Name	Branch	maths
0	210	raju	CSE	45
1	340	Aadyan	MECH	30
2	510	Aaryan	EEE	27

```python
In [18]: # TO get the column names from the dataframe..
         df.columns
```

```
Out[18]: Index(['Rollno', 'Name', 'Branch', 'maths'], dtype='object')
```

```python
In [19]: # TO get the row values data from the dataframe..
         df.values
```

```
Out[19]: array([[210, 'raju', 'CSE', 45],
                [340, 'Aadyan', 'MECH', 30],
                [510, 'Aaryan', 'EEE', 27]], dtype=object)
```

```python
In [20]: # To get the index postion..
         df.index
```

```
Out[20]: RangeIndex(start=0, stop=3, step=1)
```

```python
In [21]: df
```

Out[21]:

	Rollno	Name	Branch	maths
0	210	raju	CSE	45
1	340	Aadyan	MECH	30
2	510	Aaryan	EEE	27

```python
In [22]: # To change the index names..
         df.index=['1','2','3']
         df
```

Out[22]:

	Rollno	Name	Branch	maths
1	210	raju	CSE	45
2	340	Aadyan	MECH	30
3	510	Aaryan	EEE	27

```python
In [23]: # To get the row values based on specific column name.
         df['Name']
```

```
Out[23]: 1      raju
         2    Aadyan
         3    Aaryan
         Name: Name, dtype: object
```

In [24]:
```python
df['Rollno']
```

Out[24]:
```
1     210
2     340
3     510
Name: Rollno, dtype: int64
```

In [25]:
```python
# To get the number of rows..
print(len(df))
```

```
3
```

In [26]:
```python
df
```

Out[26]:

	Rollno	Name	Branch	maths
1	210	raju	CSE	45
2	340	Aadyan	MECH	30
3	510	Aaryan	EEE	27

In [27]:
```python
# To add the new row using loc..
df.loc['4']=['443','narmada','ECE',35]
df
```

Out[27]:

	Rollno	Name	Branch	maths
1	210	raju	CSE	45
2	340	Aadyan	MECH	30
3	510	Aaryan	EEE	27
4	443	narmada	ECE	35

In [28]:
```python
# To add new column name..
df['age'] = [20,45,26,27]
df
```

Out[28]:

	Rollno	Name	Branch	maths	age
1	210	raju	CSE	45	20
2	340	Aadyan	MECH	30	45
3	510	Aaryan	EEE	27	26
4	443	narmada	ECE	35	27

In [29]:
```python
df.shape
```

Out[29]: (4, 5)

In [30]:
```python
df
```

Out[30]:

	Rollno	Name	Branch	maths	age
1	210	raju	CSE	45	20
2	340	Aadyan	MECH	30	45
3	510	Aaryan	EEE	27	26
4	443	narmada	ECE	35	27

In [32]:
```python
# To update the value.. using loc
df.loc['3','Rollno']=222
df
```

Out[32]:

	Rollno	Name	Branch	maths	age
1	210	raju	CSE	45.0	20.0
2	340	Aadyan	MECH	30.0	45.0
3	222	Aaryan	EEE	27.0	26.0
4	443	narmada	ECE	35.0	27.0
3	222	NaN	NaN	NaN	NaN

In [33]:
```python
# TO delete the values based on row index..
df = df.drop(3)
df
```

Out[33]:

	Rollno	Name	Branch	maths	age
1	210	raju	CSE	45.0	20.0
2	340	Aadyan	MECH	30.0	45.0
3	222	Aaryan	EEE	27.0	26.0
4	443	narmada	ECE	35.0	27.0

In [34]:
```python
# TO delete the column..
df = df.drop('age',axis=1)
df
```

Out[34]:

	Rollno	Name	Branch	maths
1	210	raju	CSE	45.0
2	340	Aadyan	MECH	30.0
3	222	Aaryan	EEE	27.0
4	443	narmada	ECE	35.0

In [37]:
```python
# To print the frist two records..
# head()=>first five records
#df.head()
df.head(3)
```

Out[37]:

	Rollno	Name	Branch	maths
1	210	raju	CSE	45.0
2	340	Aadyan	MECH	30.0
3	222	Aaryan	EEE	27.0

In [39]:
```python
#to print the last two records using tail()=>last five records..
df.tail(2)
```

Out[39]:

	Rollno	Name	Branch	maths
3	222	Aaryan	EEE	27.0
4	443	narmada	ECE	35.0

In [41]:
```python
# creation of dataframe using numpy array..
n2 = np.array([[1,2,3],[4,5,6]])
print(n2)
df2 = pd.DataFrame(n2)
df2
```

```
[[1 2 3]
 [4 5 6]]
```

Out[41]:

	0	1	2
0	1	2	3
1	4	5	6

In [50]:
```python
df2[1][1]
```

Out[50]: 5

In [51]:
```python
# To read the csv file data..
df1 = pd.read_csv('data.csv')
df1
```

Out[51]:

	narmada	345	45	67
0	aaryan	210	67	89
1	aadyan	450	67	90
2	krishna	310	35	25
3	nani	670	65	32

In [52]:
```python
# TO remove the header..
df1 = pd.read_csv('data.csv',header=None)
df1
```

Out[52]:

	0	1	2	3
0	narmada	345	45	67
1	aaryan	210	67	89
2	aadyan	450	67	90
3	krishna	310	35	25
4	nani	670	65	32

In [53]:
```python
# TO update the columns..
df1.columns=['Name','Rollno','maths','english']
df1
```

Out[53]:

	Name	Rollno	maths	english
0	narmada	345	45	67
1	aaryan	210	67	89
2	aadyan	450	67	90
3	krishna	310	35	25
4	nani	670	65	32

In [54]: `# To add total marks..`
`df1['Total']=df1['maths']+df1['english']`
`df1`

Out[54]:

	Name	Rollno	maths	english	Total
0	narmada	345	45	67	112
1	aaryan	210	67	89	156
2	aadyan	450	67	90	157
3	krishna	310	35	25	60
4	nani	670	65	32	97

In [55]: `df1.head()`

Out[55]:

	Name	Rollno	maths	english	Total
0	narmada	345	45	67	112
1	aaryan	210	67	89	156
2	aadyan	450	67	90	157
3	krishna	310	35	25	60
4	nani	670	65	32	97

In [58]: `df1.tail(4)`

Out[58]:

	Name	Rollno	maths	english	Total
1	aaryan	210	67	89	156
2	aadyan	450	67	90	157
3	krishna	310	35	25	60
4	nani	670	65	32	97

In [59]: `df1`

Out[59]:

	Name	Rollno	maths	english	Total
0	narmada	345	45	67	112
1	aaryan	210	67	89	156
2	aadyan	450	67	90	157
3	krishna	310	35	25	60
4	nani	670	65	32	97

In [61]: `df1['Name']`

Out[61]:
```
0    narmada
1     aaryan
2     aadyan
3    krishna
4       nani
Name: Name, dtype: object
```

In [65]:
```python
# To create the new .csv file
dc1 = {'Name':['raju','ravi','raghu'],'marks':[100,22,45],'branch':['cse','mech',
dc1
df3 = pd.DataFrame(dc1)
print(df3)
df3.to_csv('student_marks.csv')
print("success!..")
```

```
    Name  marks branch
0   raju    100    cse
1   ravi     22   mech
2  raghu     45    eee
success!..
```

In [ ]: