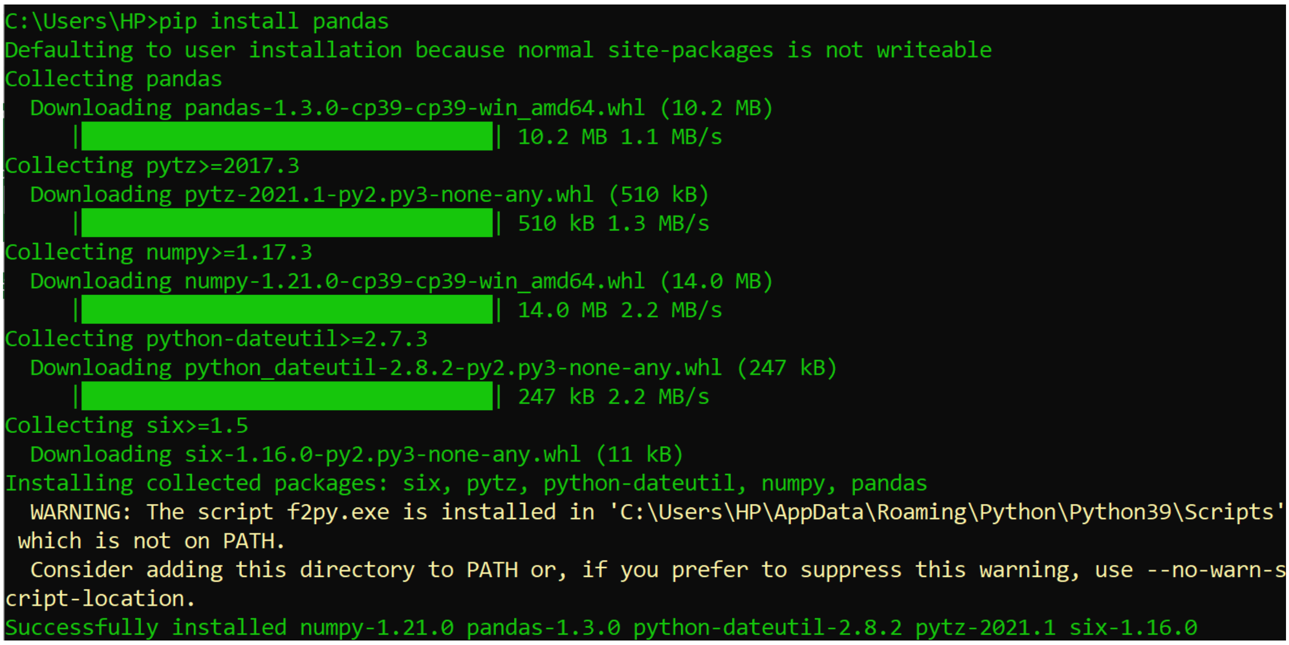
Practical Concepts : PART – 3

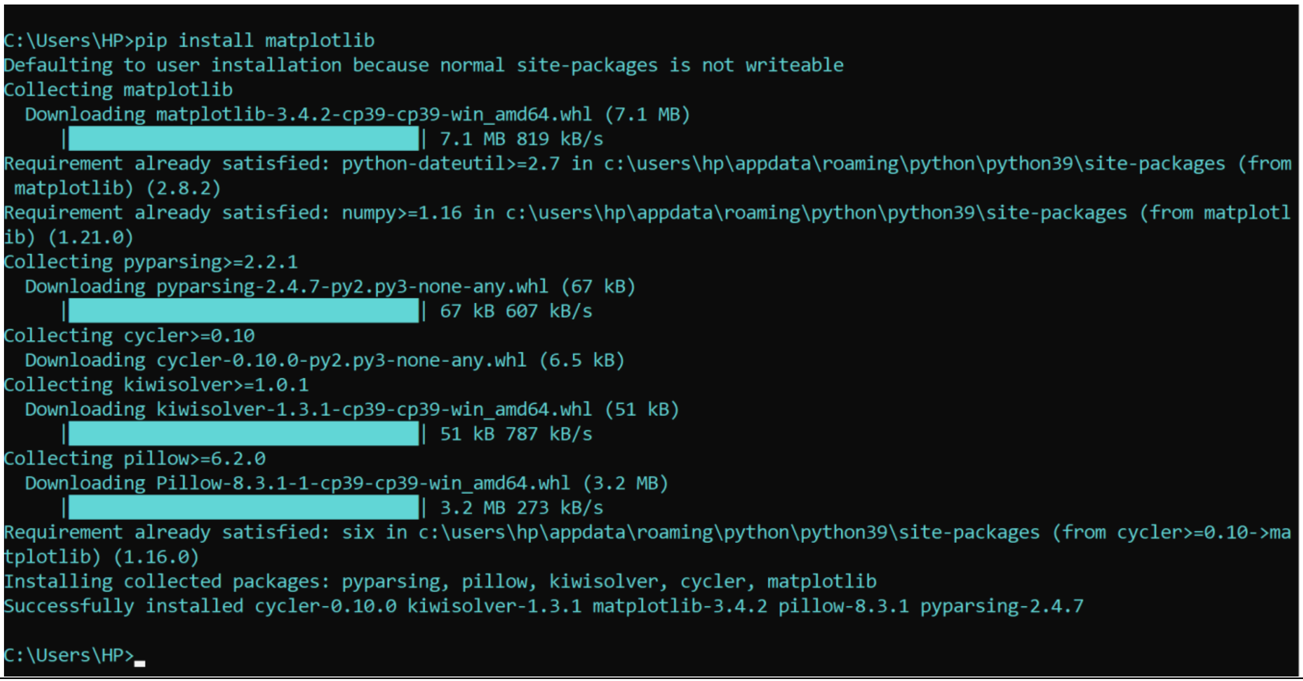
Q-1 How to install pandas, numpy and matplotlib packages in python ?

Ans. Pandas, numpy and matplotlib can be installed using following commands on cmd prompt:

- **pip install pandas**
- **pip install numpy (# no need to write this command to install numpy as already installed when pandas package is installed)**
- **pip install matplotlib**



```
C:\Users\HP>pip install pandas
Defaulting to user installation because normal site-packages is not writeable
Collecting pandas
  Downloading pandas-1.3.0-cp39-cp39-win_amd64.whl (10.2 MB)
     |████████████████████████████████| 10.2 MB 1.1 MB/s
Collecting pytz>=2017.3
  Downloading pytz-2021.1-py2.py3-none-any.whl (510 kB)
     |████████████████████████████████| 510 kB 1.3 MB/s
Collecting numpy>=1.17.3
  Downloading numpy-1.21.0-cp39-cp39-win_amd64.whl (14.0 MB)
     |████████████████████████████████| 14.0 MB 2.2 MB/s
Collecting python-dateutil>=2.7.3
  Downloading python_dateutil-2.8.2-py2.py3-none-any.whl (247 kB)
     |████████████████████████████████| 247 kB 2.2 MB/s
Collecting six>=1.5
  Downloading six-1.16.0-py2.py3-none-any.whl (11 kB)
Installing collected packages: six, pytz, python-dateutil, numpy, pandas
  WARNING: The script f2py.exe is installed in 'C:\Users\HP\AppData\Roaming\Python\Python39\Scripts'
 which is not on PATH.
  Consider adding this directory to PATH or, if you prefer to suppress this warning, use --no-warn-s
cript-location.
Successfully installed numpy-1.21.0 pandas-1.3.0 python-dateutil-2.8.2 pytz-2021.1 six-1.16.0
```



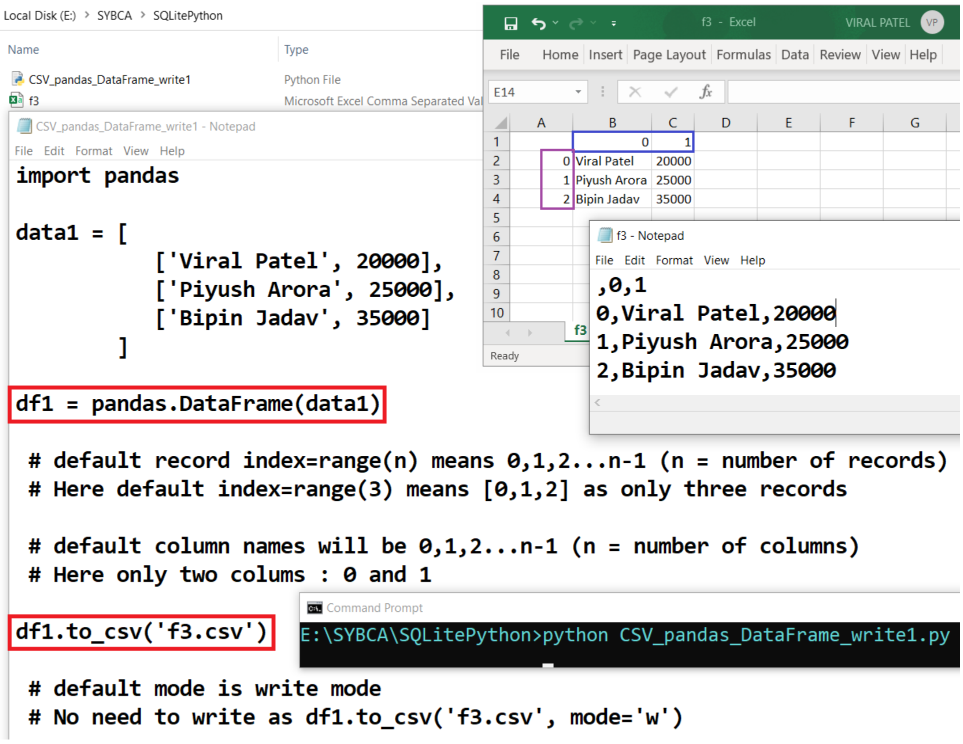
```
C:\Users\HP>pip install matplotlib
Defaulting to user installation because normal site-packages is not writeable
Collecting matplotlib
  Downloading matplotlib-3.4.2-cp39-cp39-win_amd64.whl (7.1 MB)
     |████████████████████████████████| 7.1 MB 819 kB/s
Requirement already satisfied: python-dateutil>=2.7 in c:\users\hp\appdata\roaming\python\python39\site-packages (from
 matplotlib) (2.8.2)
Requirement already satisfied: numpy>=1.16 in c:\users\hp\appdata\roaming\python\python39\site-packages (from matplotl
ib) (1.21.0)
Collecting pyparsing>=2.2.1
  Downloading pyparsing-2.4.7-py2.py3-none-any.whl (67 kB)
     |████████████████████████████████| 67 kB 607 kB/s
Collecting cycler>=0.10
  Downloading cycler-0.10.0-py2.py3-none-any.whl (6.5 kB)
Collecting kiwisolver>=1.0.1
  Downloading kiwisolver-1.3.1-cp39-cp39-win_amd64.whl (51 kB)
     |████████████████████████████████| 51 kB 787 kB/s
Collecting pillow>=6.2.0
  Downloading Pillow-8.3.1-1-cp39-cp39-win_amd64.whl (3.2 MB)
     |████████████████████████████████| 3.2 MB 273 kB/s
Requirement already satisfied: six in c:\users\hp\appdata\roaming\python\python39\site-packages (from cycler>=0.10->ma
tplotlib) (1.16.0)
Installing collected packages: pyparsing, pillow, kiwisolver, cycler, matplotlib
Successfully installed cycler-0.10.0 kiwisolver-1.3.1 matplotlib-3.4.2 pillow-8.3.1 pyparsing-2.4.7

C:\Users\HP>_
```

Q-2 How to write and append data in CSV file using DataFrame of pandas in python ?

Ans.

Default column names and row index :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Command Prompt

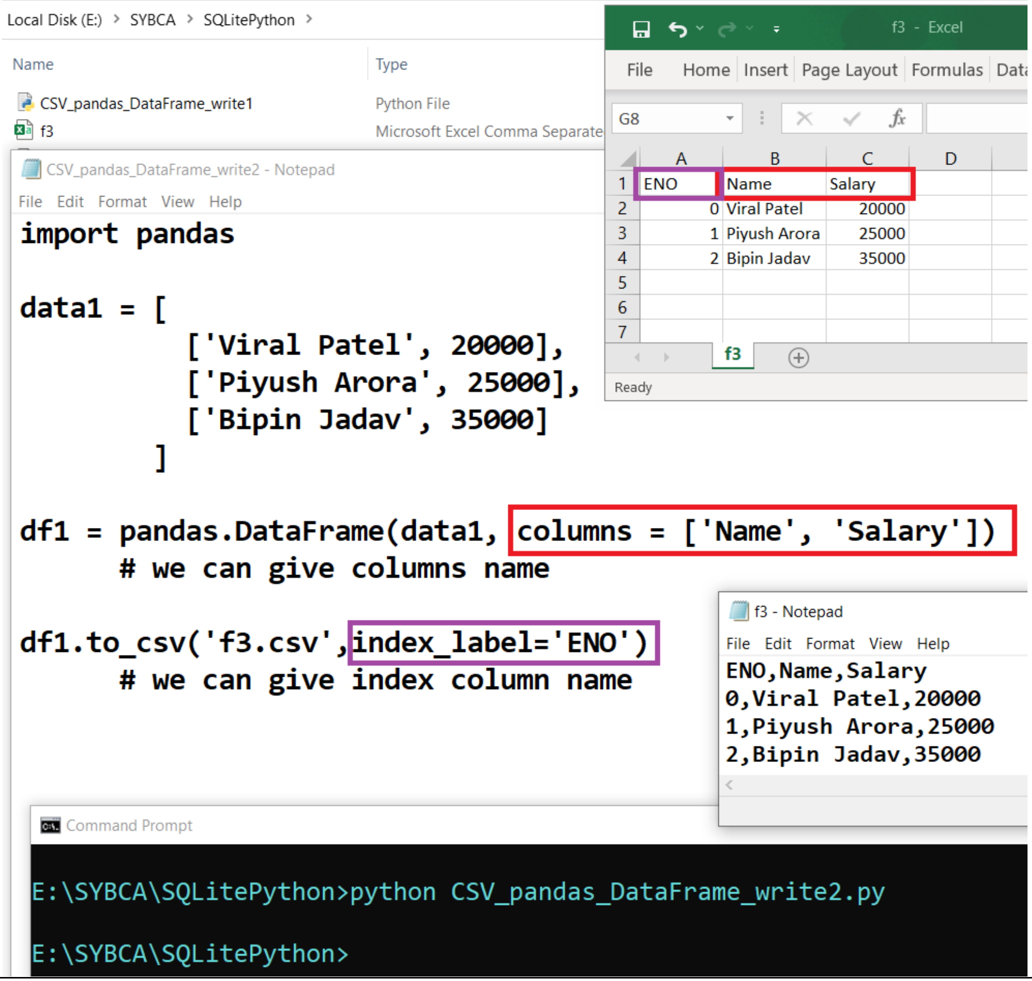
```
import pandas

data1 = [
            ['Viral Patel', 20000],
            ['Piyush Arora', 25000],
            ['Bipin Jadav', 35000]
        ]

df1 = pandas.DataFrame(data1)

 # default record index=range(n) means 0,1,2...n-1 (n = number of records)
 # Here default index=range(3) means [0,1,2] as only three records

 # default column names will be 0,1,2...n-1 (n = number of columns)
 # Here only two colums : 0 and 1

df1.to_csv('f3.csv')

 # default mode is write mode
 # No need to write as df1.to_csv('f3.csv', mode='w')
```

	A	B	C
1		0	1
2	0	Viral Patel	20000
3	1	Piyush Arora	25000
4	2	Bipin Jadav	35000

```
,0,1
0,Viral Patel,20000
1,Piyush Arora,25000
2,Bipin Jadav,35000
```

```
E:\SYBCA\SQLitePython>python CSV_pandas_DataFrame_write1.py
```

User defined column names and index column name :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f3 - Excel
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Ready
f3 - Notepad
Command Prompt

```
import pandas

data1 = [
            ['Viral Patel', 20000],
            ['Piyush Arora', 25000],
            ['Bipin Jadav', 35000]
        ]

df1 = pandas.DataFrame(data1, columns = ['Name', 'Salary'])
      # we can give columns name

df1.to_csv('f3.csv',index_label='ENO')
      # we can give index column name
```

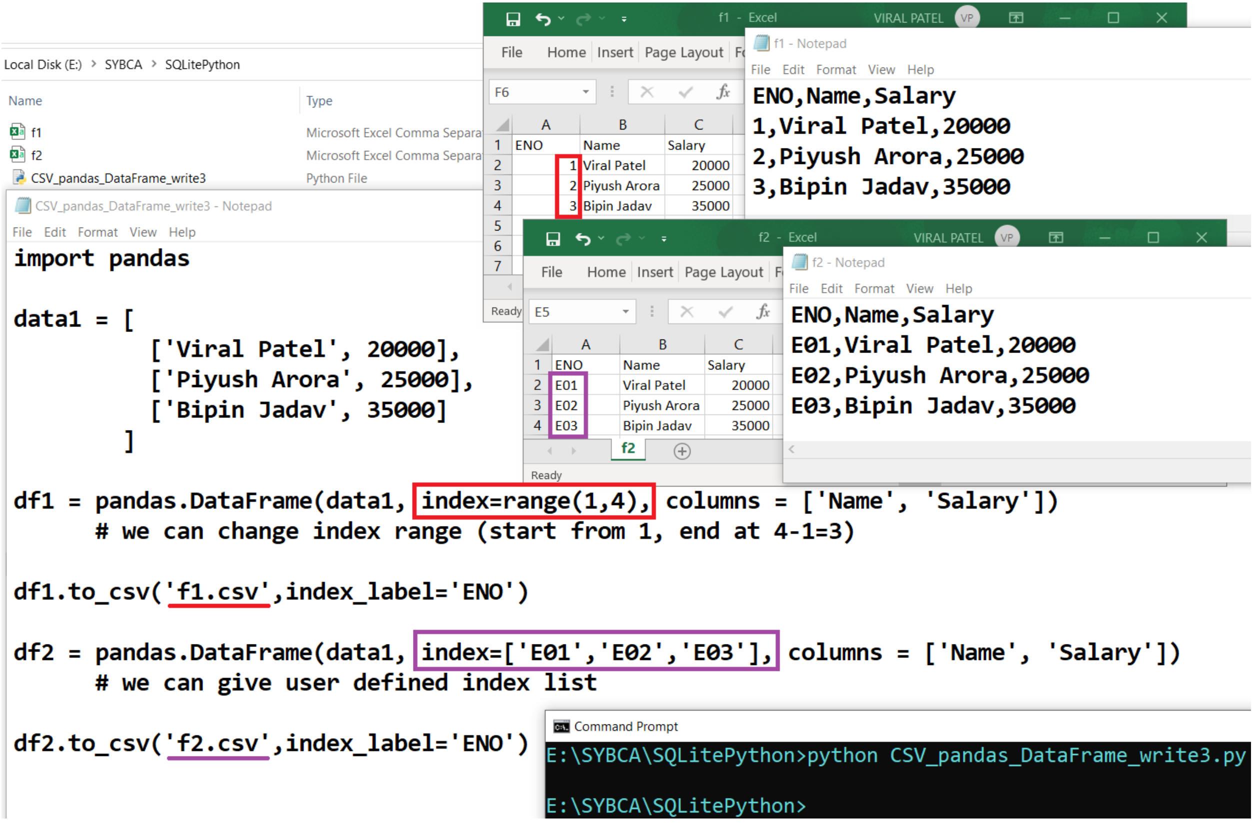
	A	B	C
1	ENO	Name	Salary
2	0	Viral Patel	20000
3	1	Piyush Arora	25000
4	2	Bipin Jadav	35000

```
ENO,Name,Salary
0,Viral Patel,20000
1,Piyush Arora,25000
2,Bipin Jadav,35000
```

```
E:\SYBCA\SQLitePython>python CSV_pandas_DataFrame_write2.py

E:\SYBCA\SQLitePython>
```

Change index as we want :



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f1 - Notepad
f2 - Excel
f2 - Notepad
E5
f2
Ready
Command Prompt

```
import pandas

data1 = [
          ['Viral Patel', 20000],
          ['Piyush Arora', 25000],
          ['Bipin Jadav', 35000]
        ]

df1 = pandas.DataFrame(data1, index=range(1,4), columns = ['Name', 'Salary'])
      # we can change index range (start from 1, end at 4-1=3)

df1.to_csv('f1.csv',index_label='ENO')

df2 = pandas.DataFrame(data1, index=['E01','E02','E03'], columns = ['Name', 'Salary'])
      # we can give user defined index list

df2.to_csv('f2.csv',index_label='ENO')
```

	A	B	C
1	ENO	Name	Salary
2	1	Viral Patel	20000
3	2	Piyush Arora	25000
4	3	Bipin Jadav	35000

```
ENO,Name,Salary
1,Viral Patel,20000
2,Piyush Arora,25000
3,Bipin Jadav,35000
```

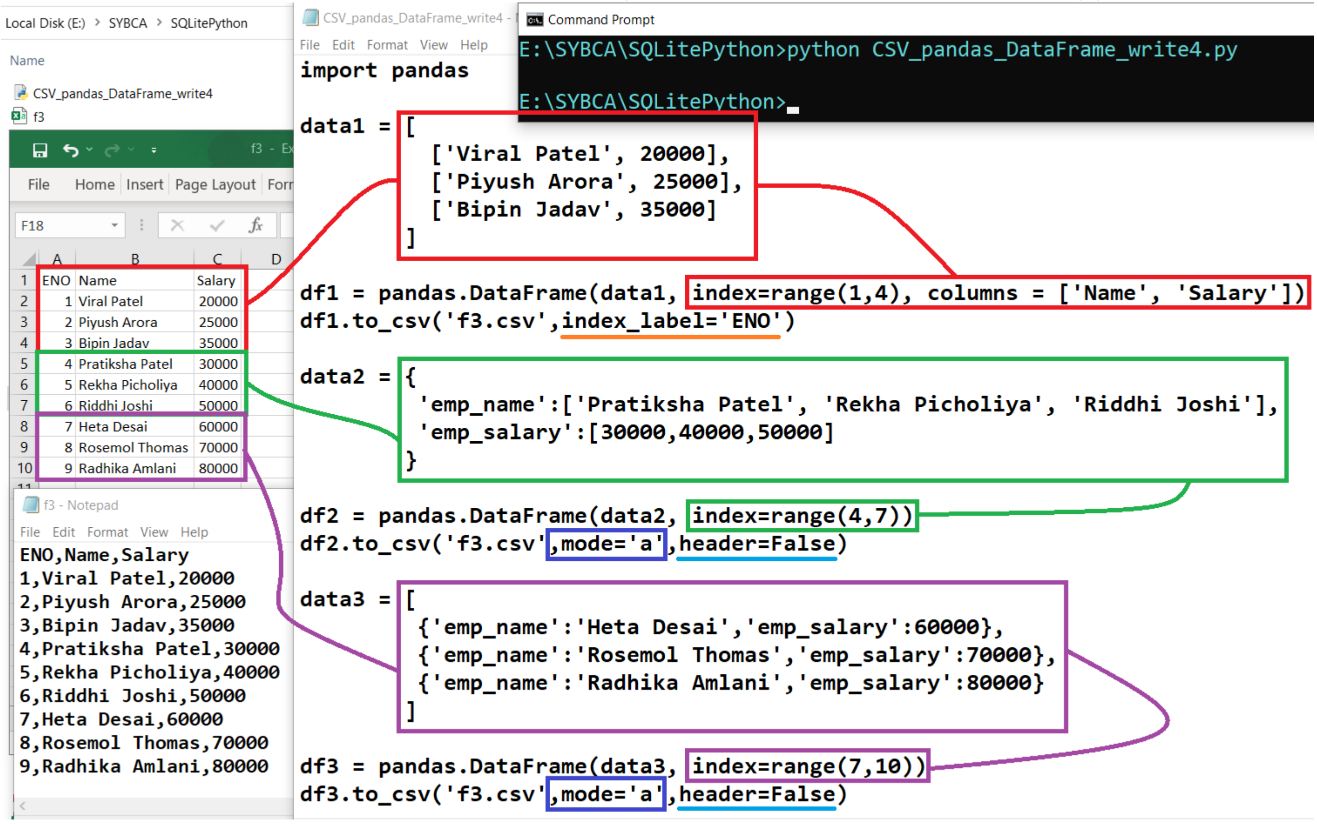
	A	B	C
1	ENO	Name	Salary
2	E01	Viral Patel	20000
3	E02	Piyush Arora	25000
4	E03	Bipin Jadav	35000

```
ENO,Name,Salary
E01,Viral Patel,20000
E02,Piyush Arora,25000
E03,Bipin Jadav,35000
```

```
E:\SYBCA\SQLitePython>python CSV_pandas_DataFrame_write3.py

E:\SYBCA\SQLitePython>
```

Different formats of data (list of lists, dictionary of lists, list of dictionaries) and Append mode :



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f3 - Notepad

```
E:\SYBCA\SQLitePython>python CSV_pandas_DataFrame_write4.py

E:\SYBCA\SQLitePython>_
```

```
import pandas

data1 = [
          ['Viral Patel', 20000],
          ['Piyush Arora', 25000],
          ['Bipin Jadav', 35000]
        ]

df1 = pandas.DataFrame(data1, index=range(1,4), columns = ['Name', 'Salary'])
df1.to_csv('f3.csv',index_label='ENO')

data2 = {
         'emp_name':['Pratiksha Patel', 'Rekha Picholiya', 'Riddhi Joshi'],
         'emp_salary':[30000,40000,50000]
        }

df2 = pandas.DataFrame(data2, index=range(4,7))
df2.to_csv('f3.csv',mode='a',header=False)

data3 = [
         {'emp_name':'Heta Desai','emp_salary':60000},
         {'emp_name':'Rosemol Thomas','emp_salary':70000},
         {'emp_name':'Radhika Amlani','emp_salary':80000}
        ]

df3 = pandas.DataFrame(data3, index=range(7,10))
df3.to_csv('f3.csv',mode='a',header=False)
```

	A	B	C	D
1	ENO	Name	Salary	
2	1	Viral Patel	20000	
3	2	Piyush Arora	25000	
4	3	Bipin Jadav	35000	
5	4	Pratiksha Patel	30000	
6	5	Rekha Picholiya	40000	
7	6	Riddhi Joshi	50000	
8	7	Heta Desai	60000	
9	8	Rosemol Thomas	70000	
10	9	Radhika Amlani	80000	

```
ENO,Name,Salary
1,Viral Patel,20000
2,Piyush Arora,25000
3,Bipin Jadav,35000
4,Pratiksha Patel,30000
5,Rekha Picholiya,40000
6,Riddhi Joshi,50000
7,Heta Desai,60000
8,Rosemol Thomas,70000
9,Radhika Amlani,80000
```

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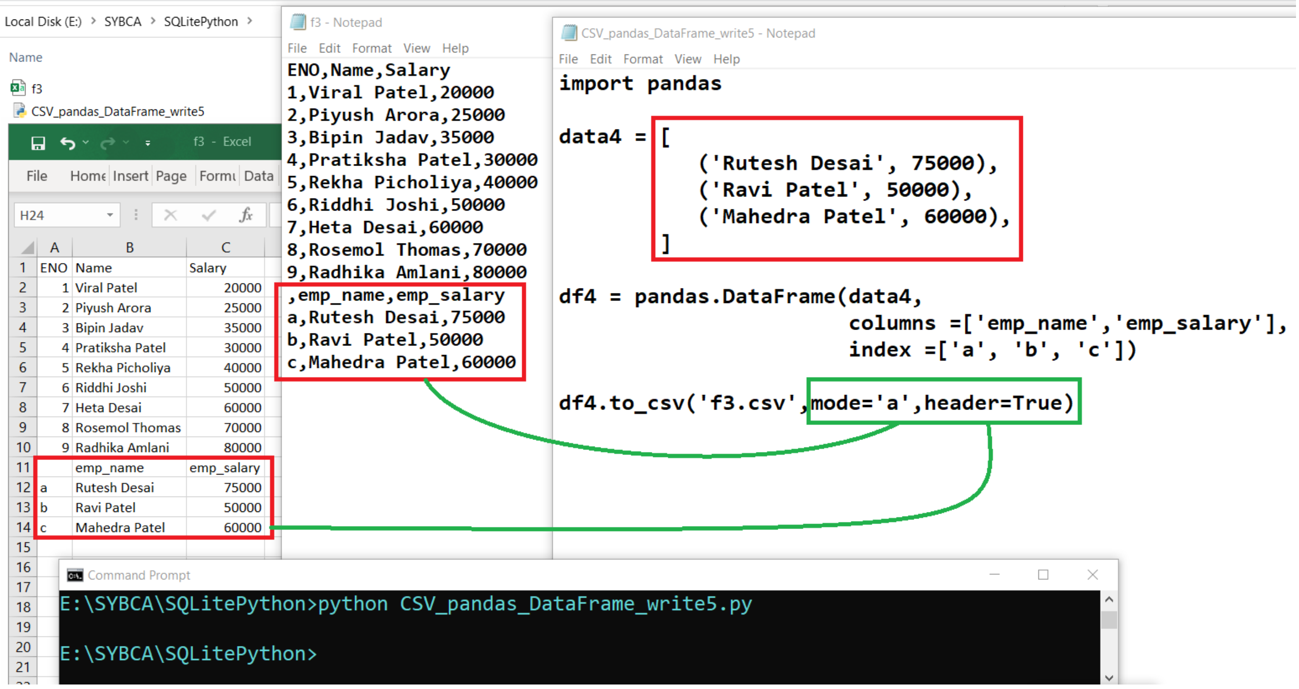
Append list of tuples format data in CSV file with new columns name :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	A	B	C
1	ENO	Name	Salary
2	1	Viral Patel	20000
3	2	Piyush Arora	25000
4	3	Bipin Jadav	35000
5	4	Pratiksha Patel	30000
6	5	Rekha Picholiya	40000
7	6	Riddhi Joshi	50000
8	7	Heta Desai	60000
9	8	Rosemol Thomas	70000
10	9	Radhika Amlani	80000
11		emp_name	emp_salary
12	a	Rutesh Desai	75000
13	b	Ravi Patel	50000
14	c	Mahedra Patel	60000

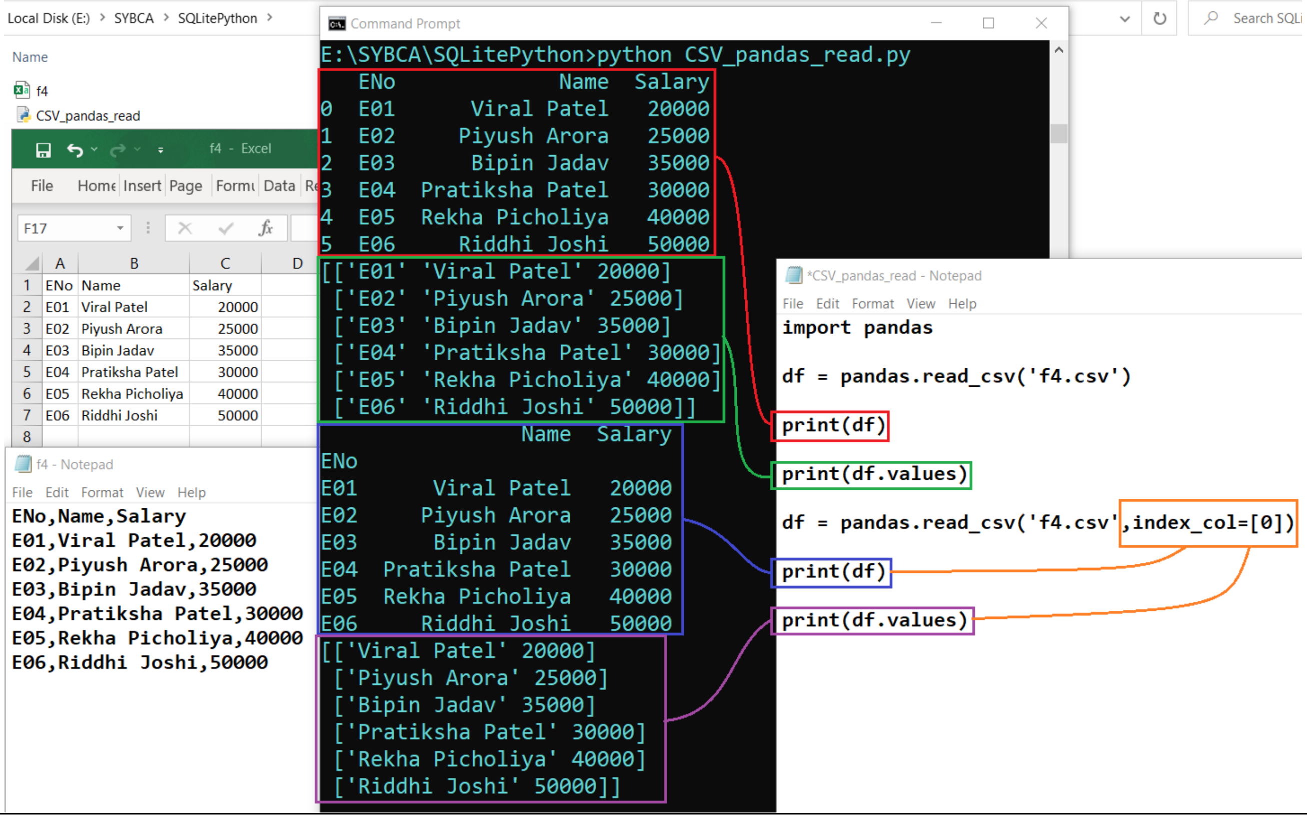
```
ENO,Name,Salary
1,Viral Patel,20000
2,Piyush Arora,25000
3,Bipin Jadav,35000
4,Pratiksha Patel,30000
5,Rekha Picholiya,40000
6,Riddhi Joshi,50000
7,Heta Desai,60000
8,Rosemol Thomas,70000
9,Radhika Amlani,80000
,emp_name,emp_salary
a,Rutesh Desai,75000
b,Ravi Patel,50000
c,Mahedra Patel,60000
```

```python
import pandas

data4 = [
     ('Rutesh Desai', 75000),
     ('Ravi Patel', 50000),
     ('Mahedra Patel', 60000),
]

df4 = pandas.DataFrame(data4,
                      columns =['emp_name','emp_salary'],
                      index =['a', 'b', 'c'])

df4.to_csv('f3.csv',mode='a',header=True)
```

```
E:\SYBCA\SQLitePython>python CSV_pandas_DataFrame_write5.py

E:\SYBCA\SQLitePython>
```

Q-3 How to read data from CSV file using pandas in python ?

Ans.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	A	B	C	D
1	ENo	Name	Salary	
2	E01	Viral Patel	20000	
3	E02	Piyush Arora	25000	
4	E03	Bipin Jadav	35000	
5	E04	Pratiksha Patel	30000	
6	E05	Rekha Picholiya	40000	
7	E06	Riddhi Joshi	50000	

```
ENo,Name,Salary
E01,Viral Patel,20000
E02,Piyush Arora,25000
E03,Bipin Jadav,35000
E04,Pratiksha Patel,30000
E05,Rekha Picholiya,40000
E06,Riddhi Joshi,50000
```

```python
import pandas

df = pandas.read_csv('f4.csv')

print(df)

print(df.values)

df = pandas.read_csv('f4.csv',index_col=[0])

print(df)

print(df.values)
```

```
E:\SYBCA\SQLitePython>python CSV_pandas_read.py
   ENo             Name  Salary
0  E01      Viral Patel   20000
1  E02     Piyush Arora   25000
2  E03      Bipin Jadav   35000
3  E04  Pratiksha Patel   30000
4  E05  Rekha Picholiya   40000
5  E06     Riddhi Joshi   50000
[['E01' 'Viral Patel' 20000]
 ['E02' 'Piyush Arora' 25000]
 ['E03' 'Bipin Jadav' 35000]
 ['E04' 'Pratiksha Patel' 30000]
 ['E05' 'Rekha Picholiya' 40000]
 ['E06' 'Riddhi Joshi' 50000]]
                Name  Salary
ENo
E01      Viral Patel   20000
E02     Piyush Arora   25000
E03      Bipin Jadav   35000
E04  Pratiksha Patel   30000
E05  Rekha Picholiya   40000
E06     Riddhi Joshi   50000
[['Viral Patel' 20000]
 ['Piyush Arora' 25000]
 ['Bipin Jadav' 35000]
 ['Pratiksha Patel' 30000]
 ['Rekha Picholiya' 40000]
 ['Riddhi Joshi' 50000]]
```

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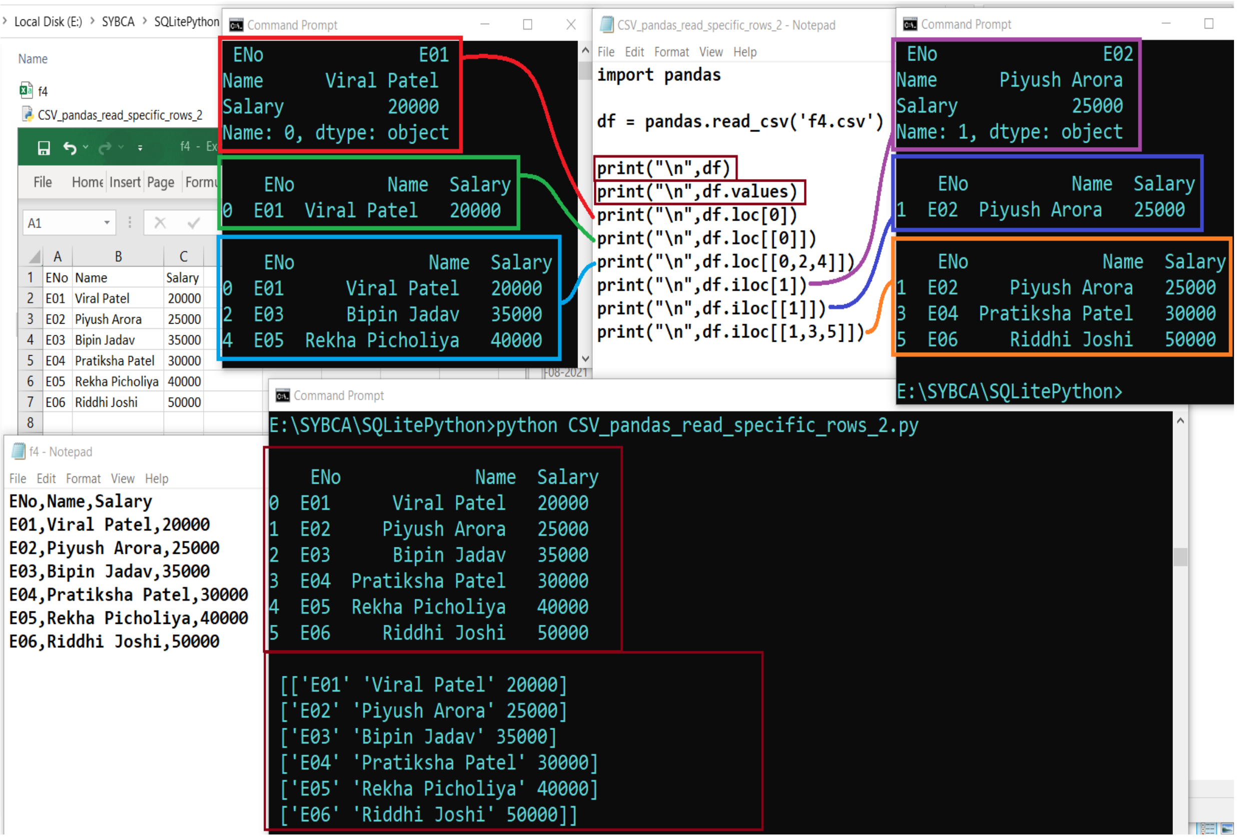
Q-4 How to extract specific row/rows from DataFrame in python ?

Ans.

System generated index column using by loc and iloc to extract rows:



	A	B	C
1	ENo	Name	Salary
2	E01	Viral Patel	20000
3	E02	Piyush Arora	25000
4	E03	Bipin Jadav	35000
5	E04	Pratiksha Patel	30000
6	E05	Rekha Picholiya	40000
7	E06	Riddhi Joshi	50000

f4 - Notepad

```
ENo,Name,Salary
E01,Viral Patel,20000
E02,Piyush Arora,25000
E03,Bipin Jadav,35000
E04,Pratiksha Patel,30000
E05,Rekha Picholiya,40000
E06,Riddhi Joshi,50000
```

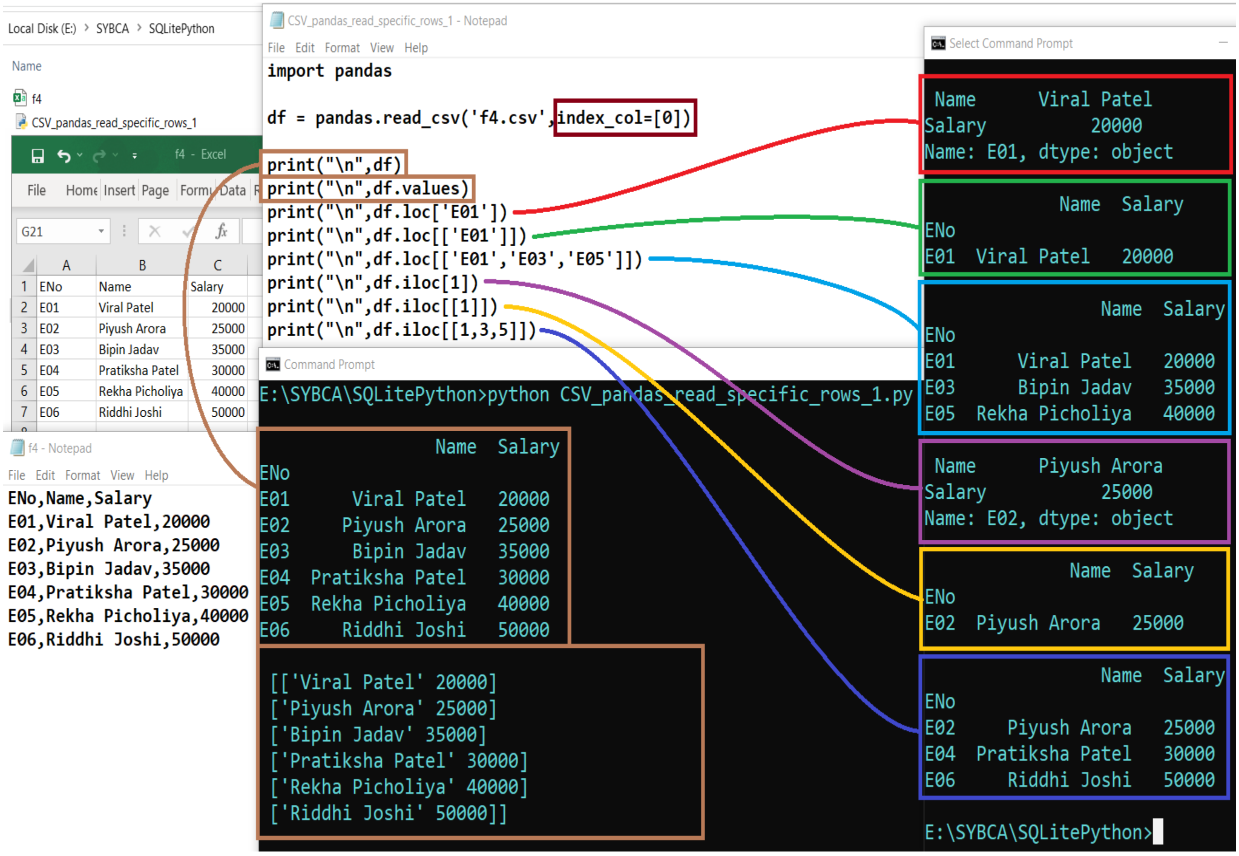
CSV_pandas_read_specific_rows_2 - Notepad

```
import pandas

df = pandas.read_csv('f4.csv')

print("\n",df)
print("\n",df.values)
print("\n",df.loc[0])
print("\n",df.loc[[0]])
print("\n",df.loc[[0,2,4]])
print("\n",df.iloc[1])
print("\n",df.iloc[[1]])
print("\n",df.iloc[[1,3,5]])
```

Command Prompt

```
E:\SYBCA\SQLitePython>python CSV_pandas_read_specific_rows_2.py

  ENo             Name  Salary
0  E01     Viral Patel   20000
1  E02    Piyush Arora   25000
2  E03     Bipin Jadav   35000
3  E04  Pratiksha Patel   30000
4  E05  Rekha Picholiya   40000
5  E06     Riddhi Joshi   50000

 [['E01' 'Viral Patel' 20000]
 ['E02' 'Piyush Arora' 25000]
 ['E03' 'Bipin Jadav' 35000]
 ['E04' 'Pratiksha Patel' 30000]
 ['E05' 'Rekha Picholiya' 40000]
 ['E06' 'Riddhi Joshi' 50000]]

ENo              E01
Name     Viral Patel
Salary         20000
Name: 0, dtype: object

   ENo         Name  Salary
0  E01  Viral Patel   20000

   ENo             Name  Salary
0  E01      Viral Patel   20000
2  E03      Bipin Jadav   35000
4  E05  Rekha Picholiya   40000

ENo               E02
Name     Piyush Arora
Salary          25000
Name: 1, dtype: object

   ENo          Name  Salary
1  E02  Piyush Arora   25000

   ENo             Name  Salary
1  E02     Piyush Arora   25000
3  E04  Pratiksha Patel   30000
5  E06     Riddhi Joshi   50000

E:\SYBCA\SQLitePython>
```

Take any particular data column as index column using by loc and iloc to extract rows:



	A	B	C
1	ENo	Name	Salary
2	E01	Viral Patel	20000
3	E02	Piyush Arora	25000
4	E03	Bipin Jadav	35000
5	E04	Pratiksha Patel	30000
6	E05	Rekha Picholiya	40000
7	E06	Riddhi Joshi	50000

f4 - Notepad

```
ENo,Name,Salary
E01,Viral Patel,20000
E02,Piyush Arora,25000
E03,Bipin Jadav,35000
E04,Pratiksha Patel,30000
E05,Rekha Picholiya,40000
E06,Riddhi Joshi,50000
```

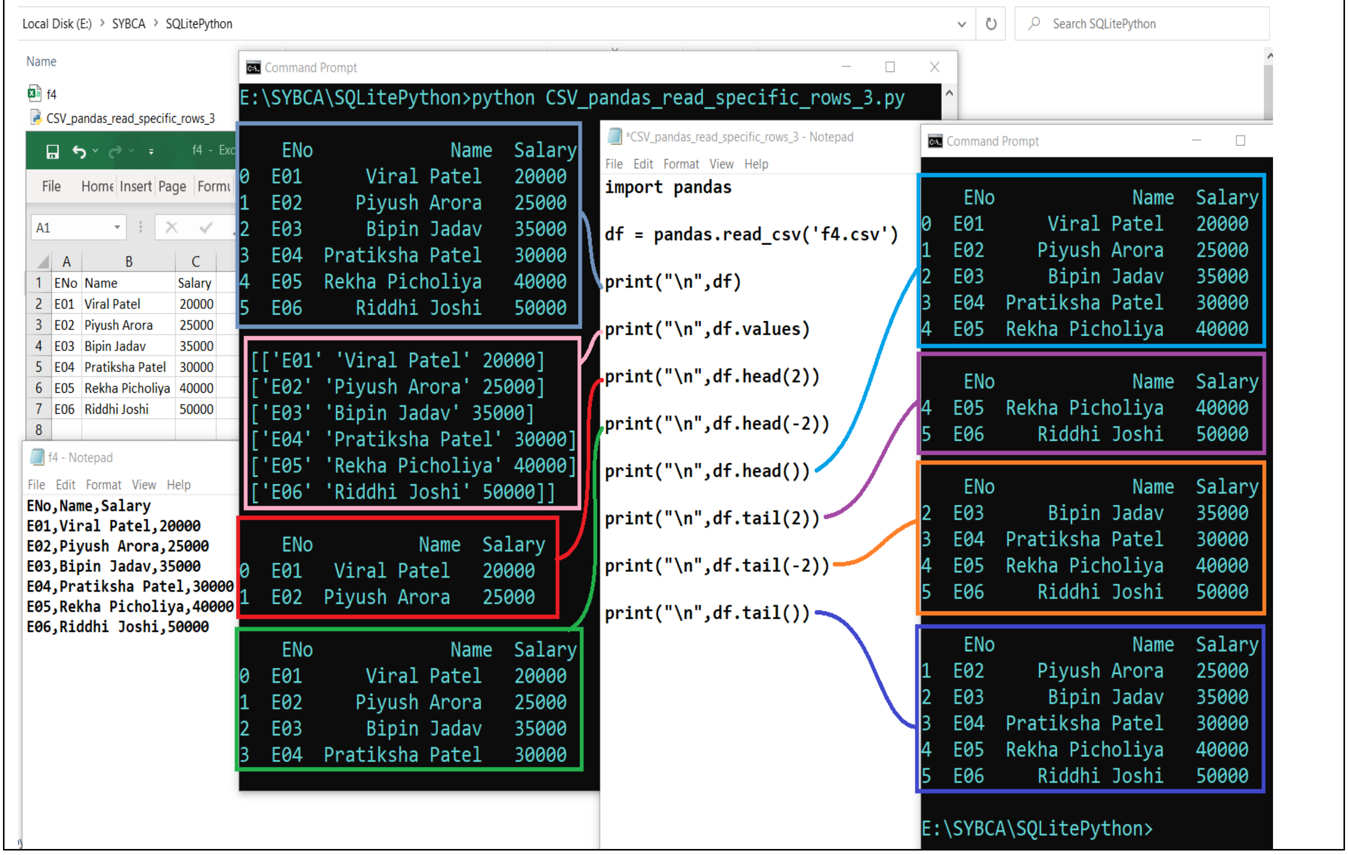
CSV_pandas_read_specific_rows_1 - Notepad

```
import pandas

df = pandas.read_csv('f4.csv',index_col=[0])

print("\n",df)
print("\n",df.values)
print("\n",df.loc['E01'])
print("\n",df.loc[['E01']])
print("\n",df.loc[['E01','E03','E05']])
print("\n",df.iloc[1])
print("\n",df.iloc[[1]])
print("\n",df.iloc[[1,3,5]])
```

Command Prompt

```
E:\SYBCA\SQLitePython>python CSV_pandas_read_specific_rows_1.py

                Name  Salary
ENo
E01      Viral Patel   20000
E02     Piyush Arora   25000
E03      Bipin Jadav   35000
E04  Pratiksha Patel   30000
E05  Rekha Picholiya   40000
E06     Riddhi Joshi   50000

 [['Viral Patel' 20000]
 ['Piyush Arora' 25000]
 ['Bipin Jadav' 35000]
 ['Pratiksha Patel' 30000]
 ['Rekha Picholiya' 40000]
 ['Riddhi Joshi' 50000]]

Name      Viral Patel
Salary          20000
Name: E01, dtype: object

            Name  Salary
ENo
E01  Viral Patel   20000

                Name  Salary
ENo
E01      Viral Patel   20000
E03      Bipin Jadav   35000
E05  Rekha Picholiya   40000

 Name      Piyush Arora
Salary           25000
Name: E02, dtype: object

             Name  Salary
ENo
E02  Piyush Arora   25000

                Name  Salary
ENo
E02     Piyush Arora   25000
E04  Pratiksha Patel   30000
E06     Riddhi Joshi   50000

E:\SYBCA\SQLitePython>
```

head() and tail() functions to extract rows :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CSV_pandas_read_specific_rows_3
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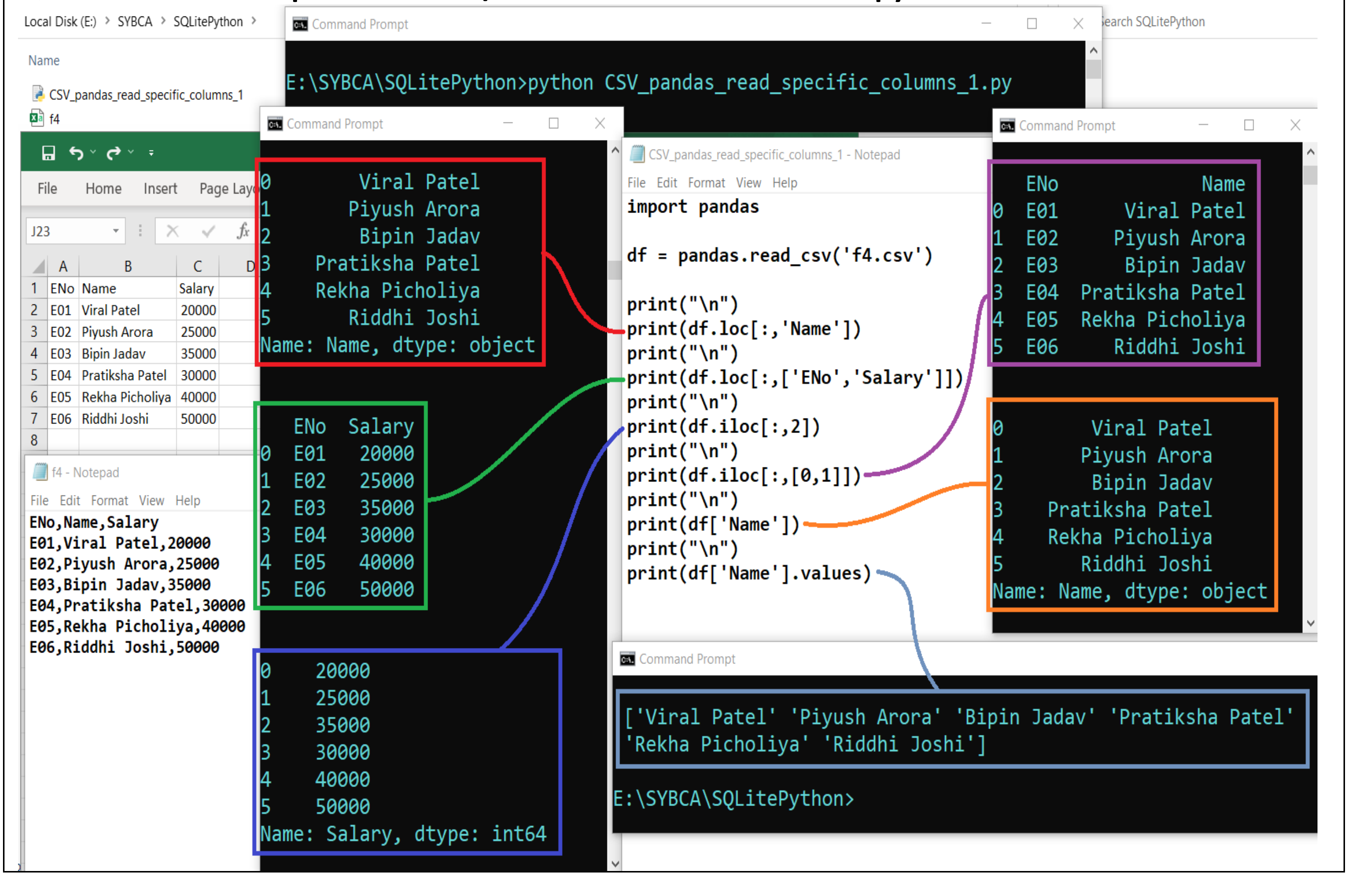
	A	B	C
1	ENo	Name	Salary
2	E01	Viral Patel	20000
3	E02	Piyush Arora	25000
4	E03	Bipin Jadav	35000
5	E04	Pratiksha Patel	30000
6	E05	Rekha Picholiya	40000
7	E06	Riddhi Joshi	50000
8			

```
ENo,Name,Salary
E01,Viral Patel,20000
E02,Piyush Arora,25000
E03,Bipin Jadav,35000
E04,Pratiksha Patel,30000
E05,Rekha Picholiya,40000
E06,Riddhi Joshi,50000
```

```
import pandas

df = pandas.read_csv('f4.csv')

print("\n",df)

print("\n",df.values)

print("\n",df.head(2))

print("\n",df.head(-2))

print("\n",df.head())

print("\n",df.tail(2))

print("\n",df.tail(-2))

print("\n",df.tail())
```

```
E:\SYBCA\SQLitePython>python CSV_pandas_read_specific_rows_3.py

   ENo             Name  Salary
0  E01      Viral Patel   20000
1  E02     Piyush Arora   25000
2  E03      Bipin Jadav   35000
3  E04  Pratiksha Patel   30000
4  E05  Rekha Picholiya   40000
5  E06     Riddhi Joshi   50000

 [['E01' 'Viral Patel' 20000]
 ['E02' 'Piyush Arora' 25000]
 ['E03' 'Bipin Jadav' 35000]
 ['E04' 'Pratiksha Patel' 30000]
 ['E05' 'Rekha Picholiya' 40000]
 ['E06' 'Riddhi Joshi' 50000]]

   ENo          Name  Salary
0  E01   Viral Patel   20000
1  E02  Piyush Arora   25000

   ENo             Name  Salary
0  E01      Viral Patel   20000
1  E02     Piyush Arora   25000
2  E03      Bipin Jadav   35000
3  E04  Pratiksha Patel   30000

   ENo             Name  Salary
0  E01      Viral Patel   20000
1  E02     Piyush Arora   25000
2  E03      Bipin Jadav   35000
3  E04  Pratiksha Patel   30000
4  E05  Rekha Picholiya   40000

   ENo             Name  Salary
4  E05  Rekha Picholiya   40000
5  E06     Riddhi Joshi   50000

   ENo             Name  Salary
2  E03      Bipin Jadav   35000
3  E04  Pratiksha Patel   30000
4  E05  Rekha Picholiya   40000
5  E06     Riddhi Joshi   50000

   ENo             Name  Salary
1  E02     Piyush Arora   25000
2  E03      Bipin Jadav   35000
3  E04  Pratiksha Patel   30000
4  E05  Rekha Picholiya   40000
5  E06     Riddhi Joshi   50000

E:\SYBCA\SQLitePython>
```

Q-5 How to extract specific column/columns from DataFrame in python ?


Local Disk (E:) › SYBCA › SQLitePython ›
Search SQLitePython
Name
CSV_pandas_read_specific_columns_1
f4
Command Prompt
CSV_pandas_read_specific_columns_1 - Notepad
File Edit Format View Help
f4 - Notepad
File Home Insert Page Lay
J23

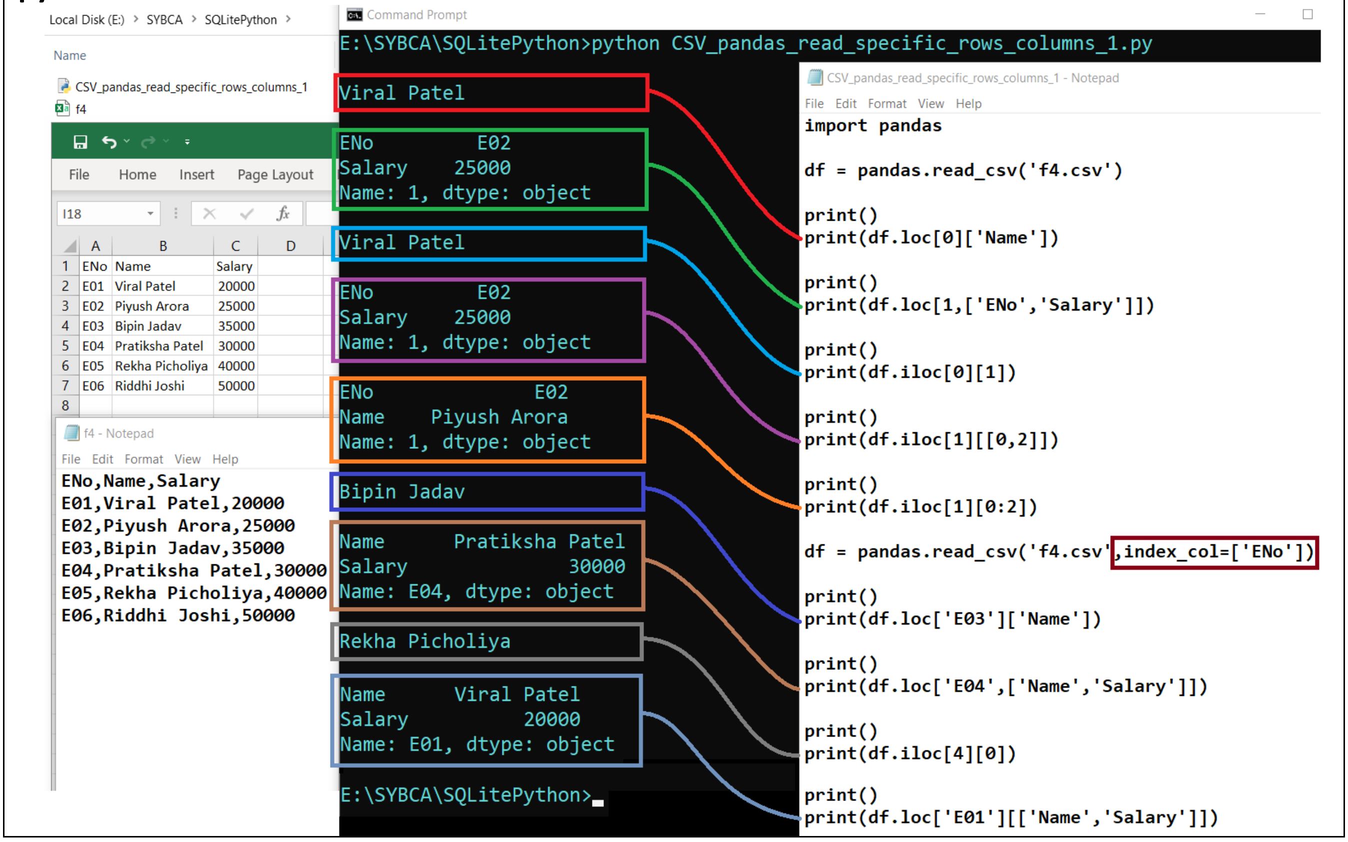
	A	B	C	D
1	ENo	Name	Salary	
2	E01	Viral Patel	20000	
3	E02	Piyush Arora	25000	
4	E03	Bipin Jadav	35000	
5	E04	Pratiksha Patel	30000	
6	E05	Rekha Picholiya	40000	
7	E06	Riddhi Joshi	50000	
8				

```
ENo,Name,Salary
E01,Viral Patel,20000
E02,Piyush Arora,25000
E03,Bipin Jadav,35000
E04,Pratiksha Patel,30000
E05,Rekha Picholiya,40000
E06,Riddhi Joshi,50000
```

```
import pandas

df = pandas.read_csv('f4.csv')

print("\n")
print(df.loc[:,'Name'])
print("\n")
print(df.loc[:,['ENo','Salary']])
print("\n")
print(df.iloc[:,2])
print("\n")
print(df.iloc[:,[0,1]])
print("\n")
print(df['Name'])
print("\n")
print(df['Name'].values)
```

```
E:\SYBCA\SQLitePython>python CSV_pandas_read_specific_columns_1.py

0        Viral Patel
1       Piyush Arora
2        Bipin Jadav
3    Pratiksha Patel
4    Rekha Picholiya
5       Riddhi Joshi
Name: Name, dtype: object

   ENo  Salary
0  E01   20000
1  E02   25000
2  E03   35000
3  E04   30000
4  E05   40000
5  E06   50000

0    20000
1    25000
2    35000
3    30000
4    40000
5    50000
Name: Salary, dtype: int64

   ENo             Name
0  E01      Viral Patel
1  E02     Piyush Arora
2  E03      Bipin Jadav
3  E04  Pratiksha Patel
4  E05  Rekha Picholiya
5  E06     Riddhi Joshi

0        Viral Patel
1       Piyush Arora
2        Bipin Jadav
3    Pratiksha Patel
4    Rekha Picholiya
5       Riddhi Joshi
Name: Name, dtype: object

['Viral Patel' 'Piyush Arora' 'Bipin Jadav' 'Pratiksha Patel'
 'Rekha Picholiya' 'Riddhi Joshi']

E:\SYBCA\SQLitePython>
```

Q-6 How to extract specific attribute/attributes of specific row/rows values from DataFrame in python ?



Local Disk (E:) > SYBCA > SQLitePython >
Name
CSV_pandas_read_specific_rows_columns_1
f4
File Home Insert Page Layout
I18
Command Prompt
CSV_pandas_read_specific_rows_columns_1 - Notepad
f4 - Notepad
File Edit Format View Help

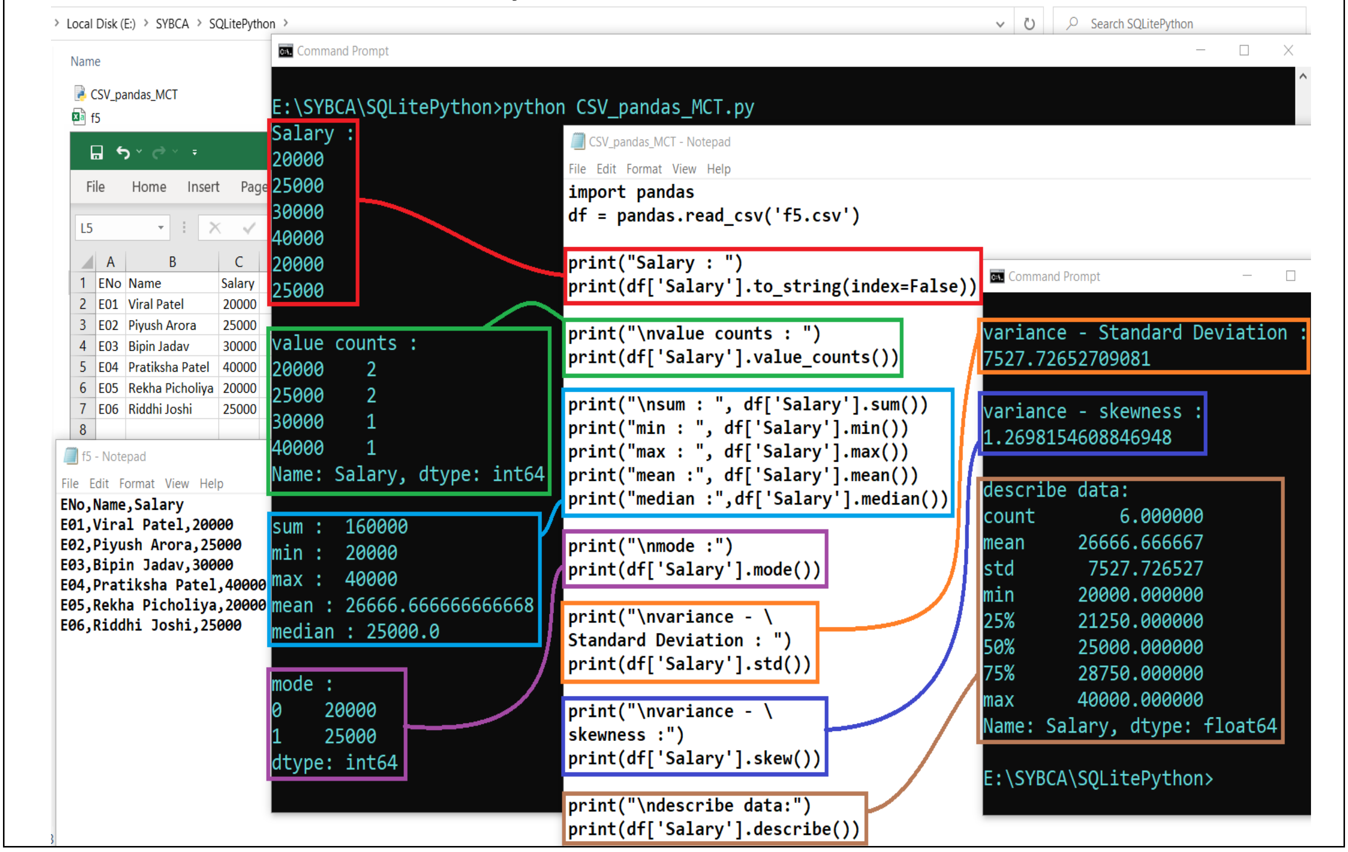
	A	B	C	D
1	ENo	Name	Salary	
2	E01	Viral Patel	20000	
3	E02	Piyush Arora	25000	
4	E03	Bipin Jadav	35000	
5	E04	Pratiksha Patel	30000	
6	E05	Rekha Picholiya	40000	
7	E06	Riddhi Joshi	50000	
8				

```
ENo,Name,Salary
E01,Viral Patel,20000
E02,Piyush Arora,25000
E03,Bipin Jadav,35000
E04,Pratiksha Patel,30000
E05,Rekha Picholiya,40000
E06,Riddhi Joshi,50000
```

```
E:\SYBCA\SQLitePython>python CSV_pandas_read_specific_rows_columns_1.py

Viral Patel

ENo          E02
Salary     25000
Name: 1, dtype: object

Viral Patel

ENo          E02
Salary     25000
Name: 1, dtype: object

ENo              E02
Name     Piyush Arora
Name: 1, dtype: object

Bipin Jadav

Name      Pratiksha Patel
Salary              30000
Name: E04, dtype: object

Rekha Picholiya

Name      Viral Patel
Salary          20000
Name: E01, dtype: object

E:\SYBCA\SQLitePython>
```

```
import pandas

df = pandas.read_csv('f4.csv')

print()
print(df.loc[0]['Name'])

print()
print(df.loc[1,['ENo','Salary']])

print()
print(df.iloc[0][1])

print()
print(df.iloc[1][[0,2]])

print()
print(df.iloc[1][0:2])

df = pandas.read_csv('f4.csv',index_col=['ENo'])

print()
print(df.loc['E03']['Name'])

print()
print(df.loc['E04',['Name','Salary']])

print()
print(df.iloc[4][0])

print()
print(df.loc['E01'][['Name','Salary']])
```

Q-7 How to measure central tendency - mean, median, mode, variance and use of describe() function?



	A	B	C
1	ENo	Name	Salary
2	E01	Viral Patel	20000
3	E02	Piyush Arora	25000
4	E03	Bipin Jadav	30000
5	E04	Pratiksha Patel	40000
6	E05	Rekha Picholiya	20000
7	E06	Riddhi Joshi	25000
8			

```
ENo,Name,Salary
E01,Viral Patel,20000
E02,Piyush Arora,25000
E03,Bipin Jadav,30000
E04,Pratiksha Patel,40000
E05,Rekha Picholiya,20000
E06,Riddhi Joshi,25000
```

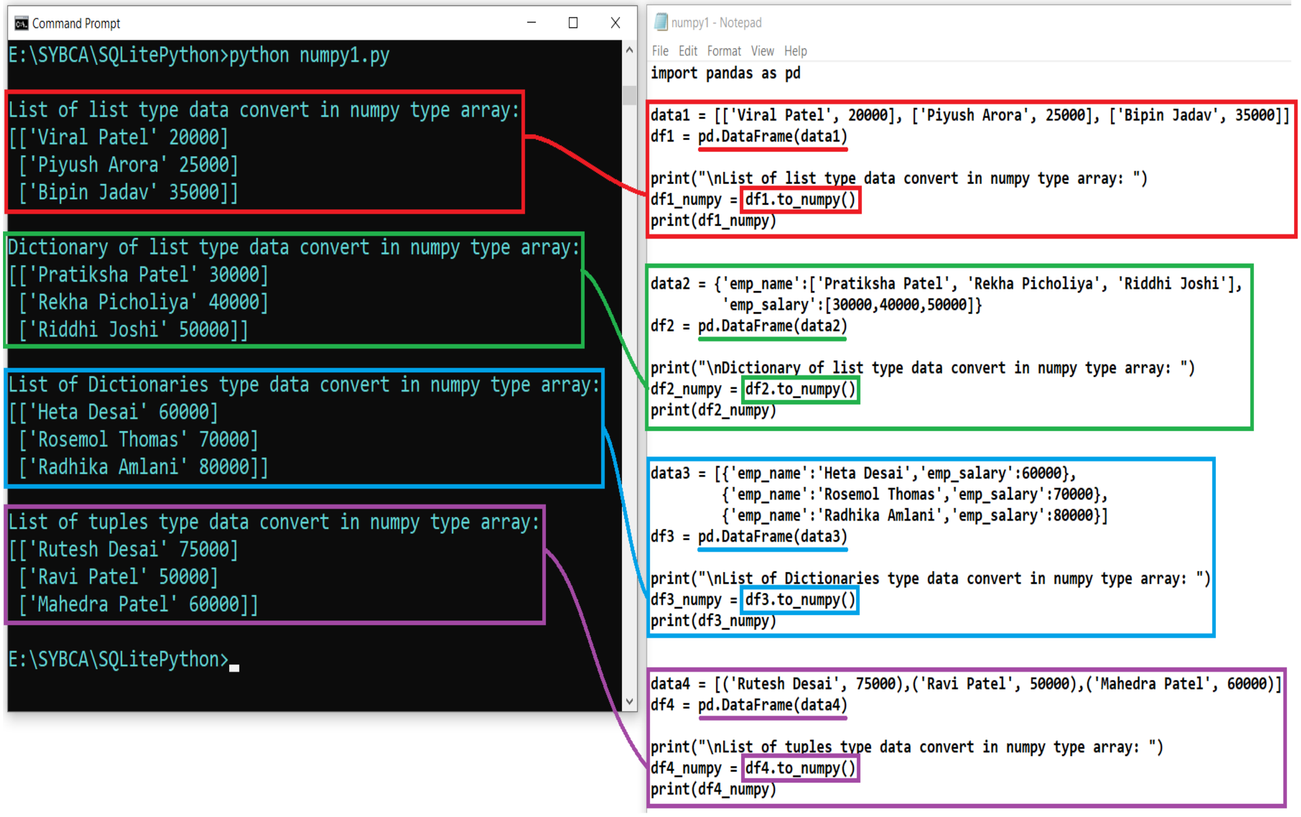
```
E:\SYBCA\SQLitePython>python CSV_pandas_MCT.py
Salary :
20000
25000
30000
40000
20000
25000

value counts :
20000    2
25000    2
30000    1
40000    1
Name: Salary, dtype: int64

sum :  160000
min :  20000
max :  40000
mean : 26666.666666666668
median : 25000.0

mode :
0    20000
1    25000
dtype: int64
```

```
import pandas
df = pandas.read_csv('f5.csv')

print("Salary : ")
print(df['Salary'].to_string(index=False))

print("\nvalue counts : ")
print(df['Salary'].value_counts())

print("\nsum : ", df['Salary'].sum())
print("min : ", df['Salary'].min())
print("max : ", df['Salary'].max())
print("mean :", df['Salary'].mean())
print("median :",df['Salary'].median())

print("\nmode :")
print(df['Salary'].mode())

print("\nvariance - \
Standard Deviation : ")
print(df['Salary'].std())

print("\nvariance - \
skewness :")
print(df['Salary'].skew())

print("\ndescribe data:")
print(df['Salary'].describe())
```

```
variance - Standard Deviation :
7527.72652709081

variance - skewness :
1.2698154608846948

describe data:
count        6.000000
mean     26666.666667
std       7527.726527
min      20000.000000
25%      21250.000000
50%      25000.000000
75%      28750.000000
max      40000.000000
Name: Salary, dtype: float64

E:\SYBCA\SQLitePython>
```

Q-8 How to convert DataFrame in Numpy array ?

Ans.

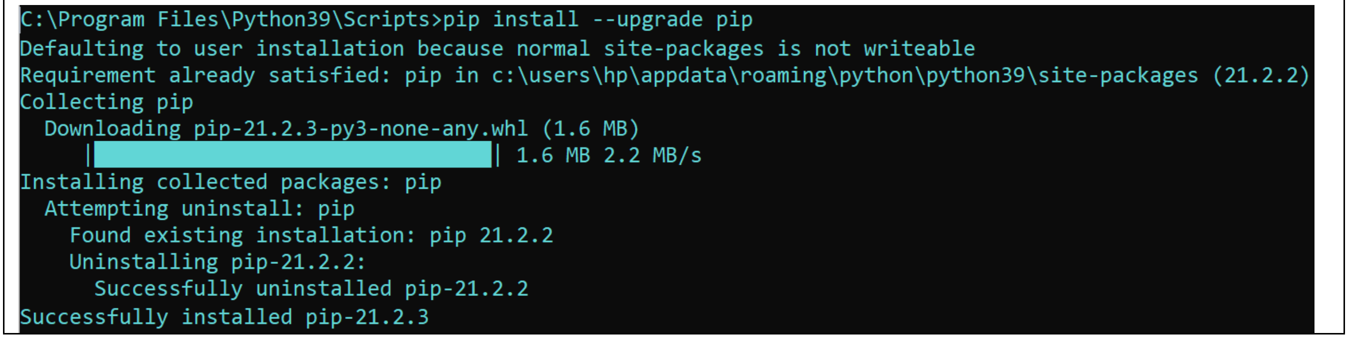


```
E:\SYBCA\SQLitePython>python numpy1.py

List of list type data convert in numpy type array:
[['Viral Patel' 20000]
 ['Piyush Arora' 25000]
 ['Bipin Jadav' 35000]]

Dictionary of list type data convert in numpy type array:
[['Pratiksha Patel' 30000]
 ['Rekha Picholiya' 40000]
 ['Riddhi Joshi' 50000]]

List of Dictionaries type data convert in numpy type array:
[['Heta Desai' 60000]
 ['Rosemol Thomas' 70000]
 ['Radhika Amlani' 80000]]

List of tuples type data convert in numpy type array:
[['Rutesh Desai' 75000]
 ['Ravi Patel' 50000]
 ['Mahedra Patel' 60000]]

E:\SYBCA\SQLitePython>
```

```python
import pandas as pd

data1 = [['Viral Patel', 20000], ['Piyush Arora', 25000], ['Bipin Jadav', 35000]]
df1 = pd.DataFrame(data1)

print("\nList of list type data convert in numpy type array: ")
df1_numpy = df1.to_numpy()
print(df1_numpy)

data2 = {'emp_name':['Pratiksha Patel', 'Rekha Picholiya', 'Riddhi Joshi'],
        'emp_salary':[30000,40000,50000]}
df2 = pd.DataFrame(data2)

print("\nDictionary of list type data convert in numpy type array: ")
df2_numpy = df2.to_numpy()
print(df2_numpy)

data3 = [{'emp_name':'Heta Desai','emp_salary':60000},
         {'emp_name':'Rosemol Thomas','emp_salary':70000},
         {'emp_name':'Radhika Amlani','emp_salary':80000}]
df3 = pd.DataFrame(data3)

print("\nList of Dictionaries type data convert in numpy type array: ")
df3_numpy = df3.to_numpy()
print(df3_numpy)

data4 = [('Rutesh Desai', 75000),('Ravi Patel', 50000),('Mahedra Patel', 60000)]
df4 = pd.DataFrame(data4)

print("\nList of tuples type data convert in numpy type array: ")
df4_numpy = df4.to_numpy()
print(df4_numpy)
```

Q-9 How to update pip command ?

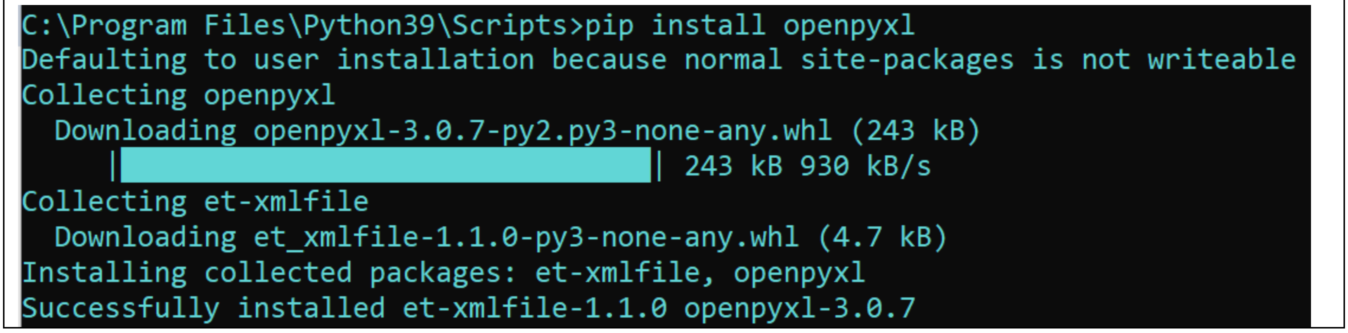
Ans.



```
C:\Program Files\Python39\Scripts>pip install --upgrade pip
Defaulting to user installation because normal site-packages is not writeable
Requirement already satisfied: pip in c:\users\hp\appdata\roaming\python\python39\site-packages (21.2.2)
Collecting pip
  Downloading pip-21.2.3-py3-none-any.whl (1.6 MB)
     |████████████████████████████████| 1.6 MB 2.2 MB/s
Installing collected packages: pip
  Attempting uninstall: pip
    Found existing installation: pip 21.2.2
    Uninstalling pip-21.2.2:
      Successfully uninstalled pip-21.2.2
Successfully installed pip-21.2.3
```

Q-10 How to install openpyxl package in python (to read and write in excel file using DataFrame) ?

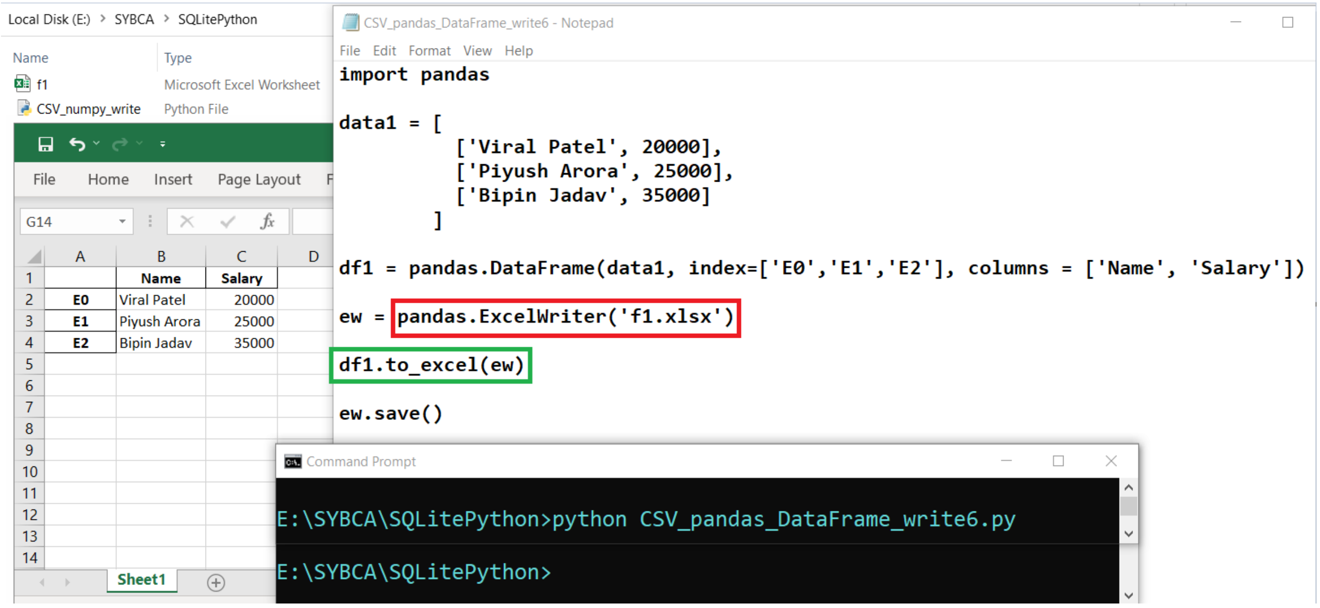
Ans.



```
C:\Program Files\Python39\Scripts>pip install openpyxl
Defaulting to user installation because normal site-packages is not writeable
Collecting openpyxl
  Downloading openpyxl-3.0.7-py2.py3-none-any.whl (243 kB)
     |████████████████████████████████| 243 kB 930 kB/s
Collecting et-xmlfile
  Downloading et_xmlfile-1.1.0-py3-none-any.whl (4.7 kB)
Installing collected packages: et-xmlfile, openpyxl
Successfully installed et-xmlfile-1.1.0 openpyxl-3.0.7
```

Q-11 How to write data in excel file using DataFrame in python ?

Ans.


Local Disk (E:) > SYBCA > SQLitePython
CSV_pandas_DataFrame_write6 - Notepad
File Edit Format View Help
File Home Insert Page Layout
G14
Sheet1
Command Prompt

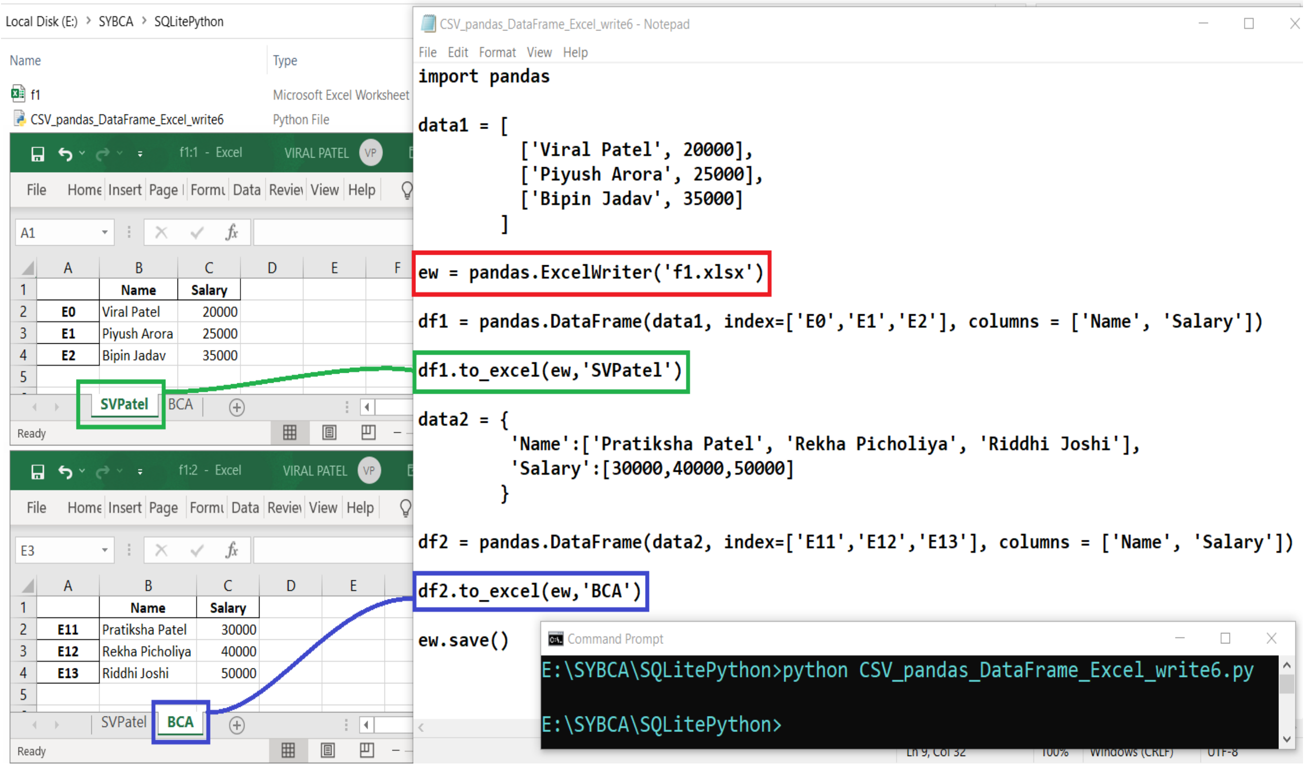
Name	Type
f1	Microsoft Excel Worksheet
CSV_numpy_write	Python File

	A	B	C	D
1		Name	Salary	
2	E0	Viral Patel	20000	
3	E1	Piyush Arora	25000	
4	E2	Bipin Jadav	35000	
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				

```
import pandas

data1 = [
          ['Viral Patel', 20000],
          ['Piyush Arora', 25000],
          ['Bipin Jadav', 35000]
        ]

df1 = pandas.DataFrame(data1, index=['E0','E1','E2'], columns = ['Name', 'Salary'])

ew = pandas.ExcelWriter('f1.xlsx')

df1.to_excel(ew)

ew.save()
```

```
E:\SYBCA\SQLitePython>python CSV_pandas_DataFrame_write6.py

E:\SYBCA\SQLitePython>
```

Write data in specific excel sheet of excel file :


Local Disk (E:) > SYBCA > SQLitePython
CSV_pandas_DataFrame_Excel_write6 - Notepad
File Edit Format View Help
f1:1 - Excel
VIRAL PATEL
VP
File Home Insert Page Formu Data Revie View Help
A1
SVPatel
BCA
Ready
f1:2 - Excel
E3
Command Prompt
Ln 9, Col 32
100%
Windows (CRLF)
UTF-8

Name	Type
f1	Microsoft Excel Worksheet
CSV_pandas_DataFrame_Excel_write6	Python File

	A	B	C	D	E	F
1		Name	Salary			
2	E0	Viral Patel	20000			
3	E1	Piyush Arora	25000			
4	E2	Bipin Jadav	35000			
5						

	A	B	C	D	E
1		Name	Salary		
2	E11	Pratiksha Patel	30000		
3	E12	Rekha Picholiya	40000		
4	E13	Riddhi Joshi	50000		
5					

```
import pandas

data1 = [
          ['Viral Patel', 20000],
          ['Piyush Arora', 25000],
          ['Bipin Jadav', 35000]
        ]

ew = pandas.ExcelWriter('f1.xlsx')

df1 = pandas.DataFrame(data1, index=['E0','E1','E2'], columns = ['Name', 'Salary'])

df1.to_excel(ew,'SVPatel')

data2 = {
         'Name':['Pratiksha Patel', 'Rekha Picholiya', 'Riddhi Joshi'],
         'Salary':[30000,40000,50000]
        }

df2 = pandas.DataFrame(data2, index=['E11','E12','E13'], columns = ['Name', 'Salary'])

df2.to_excel(ew,'BCA')

ew.save()
```

```
E:\SYBCA\SQLitePython>python CSV_pandas_DataFrame_Excel_write6.py

E:\SYBCA\SQLitePython>
```

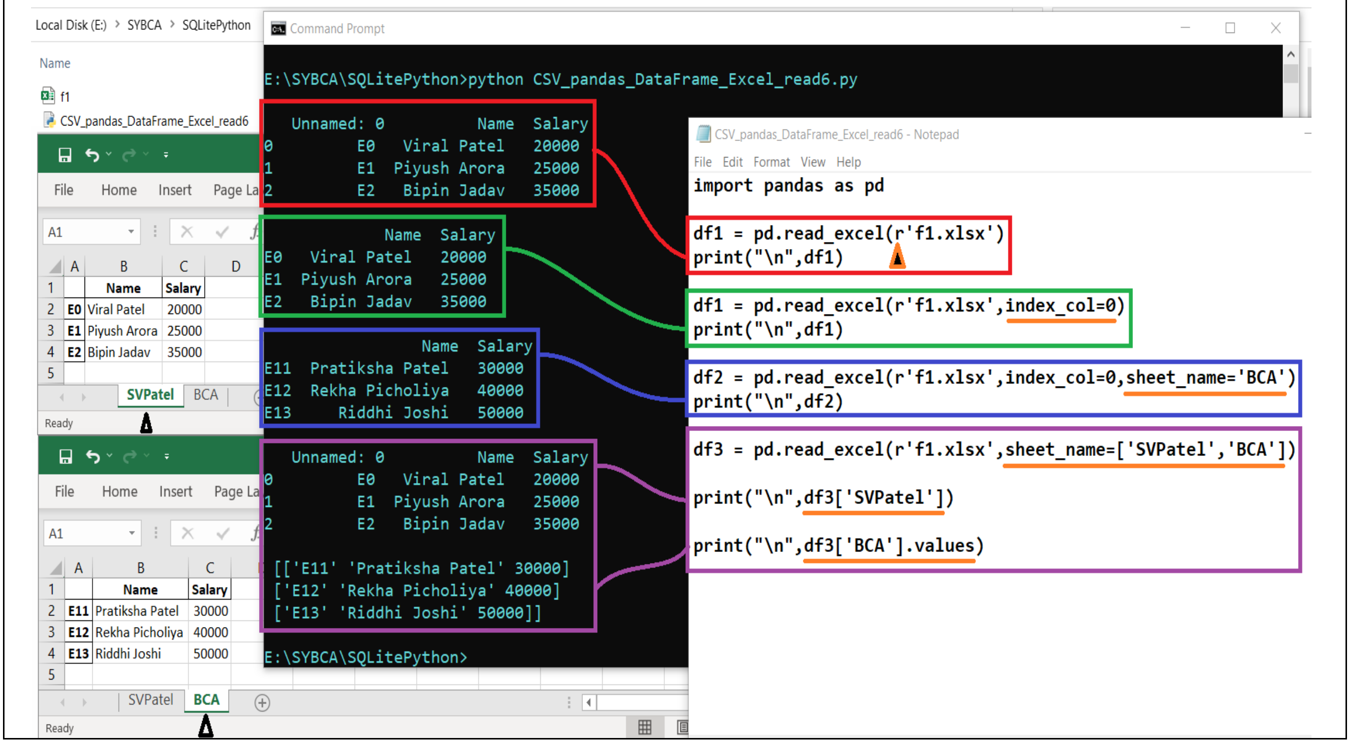
Asst. Prof. Viral S. Patel

Q-12 How to read data from excel file ?

Ans.

For old pandas version to read excel file need to install xlrd : pip install xlrd==1.2.0

For new pandas version no need to install xlrd.


Local Disk (E:) › SYBCA › SQLitePython
Name
f1
CSV_pandas_DataFrame_Excel_read6
Command Prompt
CSV_pandas_DataFrame_Excel_read6 - Notepad
File Edit Format View Help
File Home Insert Page La
A1
SVPatel BCA
Ready

	A	B	C	D
1		Name	Salary	
2	E0	Viral Patel	20000	
3	E1	Piyush Arora	25000	
4	E2	Bipin Jadav	35000	
5				

	A	B	C
1		Name	Salary
2	E11	Pratiksha Patel	30000
3	E12	Rekha Picholiya	40000
4	E13	Riddhi Joshi	50000
5			

```
import pandas as pd

df1 = pd.read_excel(r'f1.xlsx')
print("\n",df1)

df1 = pd.read_excel(r'f1.xlsx',index_col=0)
print("\n",df1)

df2 = pd.read_excel(r'f1.xlsx',index_col=0,sheet_name='BCA')
print("\n",df2)

df3 = pd.read_excel(r'f1.xlsx',sheet_name=['SVPatel','BCA'])

print("\n",df3['SVPatel'])

print("\n",df3['BCA'].values)
```

```
E:\SYBCA\SQLitePython>python CSV_pandas_DataFrame_Excel_read6.py

   Unnamed: 0          Name  Salary
0          E0   Viral Patel   20000
1          E1  Piyush Arora   25000
2          E2   Bipin Jadav   35000

             Name  Salary
E0    Viral Patel   20000
E1   Piyush Arora   25000
E2    Bipin Jadav   35000

                 Name  Salary
E11   Pratiksha Patel   30000
E12   Rekha Picholiya   40000
E13      Riddhi Joshi   50000

   Unnamed: 0          Name  Salary
0          E0   Viral Patel   20000
1          E1  Piyush Arora   25000
2          E2   Bipin Jadav   35000

 [['E11' 'Pratiksha Patel' 30000]
 ['E12' 'Rekha Picholiya' 40000]
 ['E13' 'Riddhi Joshi' 50000]]

E:\SYBCA\SQLitePython>
```

Asst. Prof. Viral S. Patel