

Practical -1

ATM : Installation of python libraries

- 1) Pandas library
- 2) numpy library
- 3) scikit learn library
- 4) matplotlib library

Input : To Install all four libraries

1) numpy : 1) pip install numpy
2) import numpy

2) Pandas : 1) pip install pandas
2) import pandas

3) scikit learn : 1) python -m venv sklearn-env
2) sklearn-env\script /activate
3) pip install -v scikit-learn

4) matplotlib : 1) pip install matplotlib

Output :

Installing collected packages : numpy , pandas ,
scikit-learn , matplotlib .
successfully installed numpy - 1.24.2

pandas - 1.5.3

scikit-learn - 1.2.1 , matplotlib - 3.6.3

Theory : python has many libraries that help in data processing, machine learning & visualization. Below are simple explanations & ex of the above libraries covered in this practical.

1) Numpy :

- uses : - Help in working with numbers & array.
- supports mathematical operation like addition, multiplication & finding the average.

- ex :

```
import numpy as np
arr = np.array([5, 6, 7, 8, 9])
print("Numpy Array : " + str(arr))
```

Output : Numpy Array : [5, 6, 7, 8, 9]

2) Pandas :

- uses : - Helps in organizing & analyzing data in tables.
- used to read & write data from files like CSV & excel.

- Installation Steps :

- open the command prompt or terminal
- Run the following command.

pip install pandas

- verify the installation by running
python

import pandas

- Ex:

```
import pandas as pd
data = {'Name': ['Amit', 'Riya'], 'Age': [21, 22]}
df = pd.DataFrame(data)
print(df)
```

output

	Name	age
0	Amit	21
1	Riya	22

3) scikit - learn :

- uses : Help in machine learning tasks like prediction
& classification
• provides tools to process & analyze data

Installation steps -

1) open the command prompt

2) Run the following command

- pip install scikit - learn

3) verify the installation by running
import sklearn

ex:

```
from sklearn.preprocessing import minmax
data = [10, 20, 30]
scale = MinMaxScaler()
scaled_data = scale.fit_transform(data)
print(scaled_data)
```

output : $\begin{bmatrix} 0.0 \\ 0.5 \\ 1.0 \end{bmatrix}$

This confirms that the data has been in the $[0, 1]$ range.

4) Matplotlib

- uses :- Help in making simple charts & graphs
• Used to visualize data in a clear way

- Installation:

- ✓ • open the command prompt
- Run the command
 - pip install matplotlib
- verify the installation by running:
python
import matplotlib

- ex :

```
import matplotlib.pyplot as plt
X = [1, 2, 3, 4, 5]
Y = [2, 4, 6, 8, 10]
```



```

plt.plot(x, y, marker='o')
plt.title("simple line plot")
plt.xlabel("X-axis")
plt.ylabel("Y-axis")
plt.show()

```

output : a line graph will be display

Conclusion:

The libraries numpy, pandas, scikit-learn & Matplotlib were installed successfully. we also demonstrated their usage in numerical computation, data manipulation, data visualization & machine learning. These libraries are essential for Scientific computing & data analysis in python.

References:

geek for geek (<https://www.geeksforgeeks.org/>)
python.org (<https://www.python.org/>)
W3Schools
(<https://www.w3schools.com/>)

Abhinav
25/03/25

A3	V(u)	P(3)	Total	sign