Shri Vile Parle Kelavani Mandal's
DWARKADAS J. SANGHVI COLLEGE OF ENGINEERING
(Autonomous College Affiliated to the University of Mumbai)
NAAC Accredited with "A" Grade (CGPA : 3.18)

A.Y. 2022-2023

Subject: Python **SAP ID: 60004220253 – Devansh Mehta**

Experiment No. 11

Aim: Make use of advance modules of Python like OpenCV, Matplotlib, NumPy

Code:

NumPy

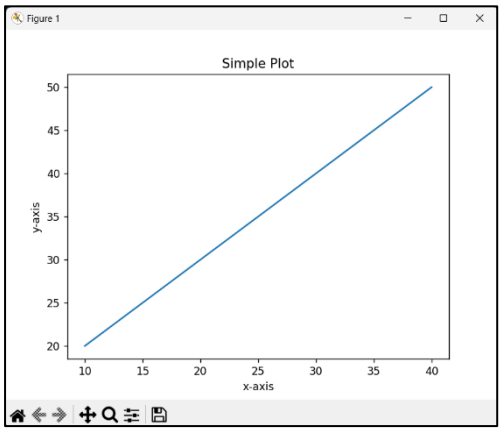
```
import numpy as np
arr = np.array([1, 2, 3, 4, 5])
print("\n",arr)
print(type(arr))
arr2 = np.array([[1, 2, 3], [4, 5, 6]])
print("\n",arr2)
print("Number of dimensions:",arr2.ndim)
print("\nArray Indexing:")
print(arr[2] + arr[3])
arr = np.array([[1,2,3,4,5], [6,7,8,9,10]])
print("\nAccessing in 2D array:",arr)
print('5th element on 2nd row: ', arr[1, 4])
print('\nLast element from 2nd dim: ', arr[1,
-1])
arr = np.array([1, 2, 3, 4, 5, 6, 7])
print("\nSlicing in array", arr)
print(arr[4:])
print("\nSlicing in array using step:")
print(arr[1:5:2])
arr = np.array([3, 2, 0, 1])
print('\nSorting array', arr)
print(np.sort(arr))
arr = np.array(['banana', 'cherry', 'apple'])
print('\nSorting array',arr)
print(np.sort(arr))
```

```
 [1 2 3 4 5]
<class 'numpy.ndarray'>

 [[1 2 3]
 [4 5 6]]
Number of dimensions: 2

Array Indexing:
7

Accessing in 2D array: [[ 1  2  3  4  5]
 [ 6  7  8  9 10]]
5th element on 2nd row:  10

Last element from 2nd dim:  10

Slicing in array [1 2 3 4 5 6 7]
[5 6 7]

Slicing in array using step:
[2 4]

Sorting array [3 2 0 1]
[0 1 2 3]

Sorting array ['banana' 'cherry' 'apple']
['apple' 'banana' 'cherry']
```

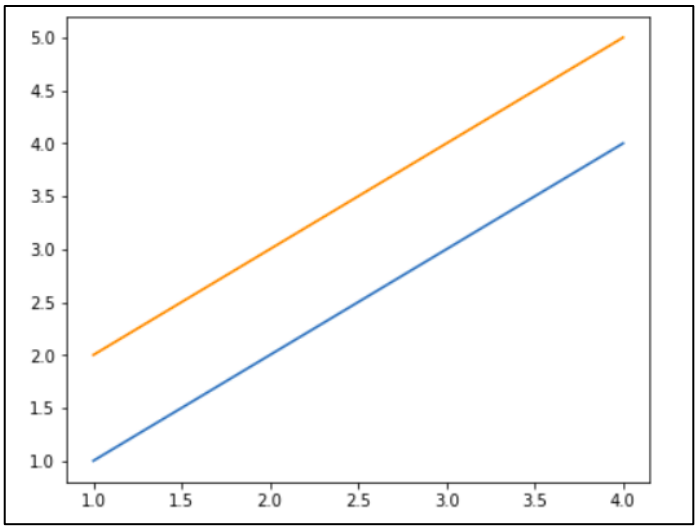
Matplotlib:

Plotting a simple plot:

```
import matplotlib.pyplot as plt
x = [10, 20, 30, 40]
y = [20, 30, 40, 50]
plt.plot(x, y)
plt.title("Simple Plot")
```



```
plt.ylabel("y-axis")
plt.xlabel("x-axis")
plt.show()
```

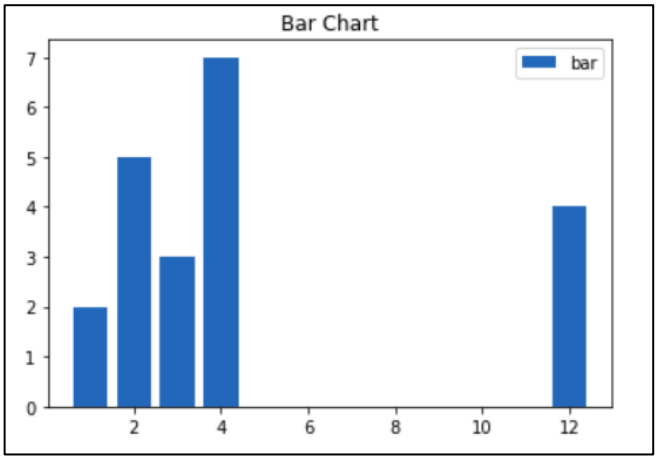


Plotting multiple lines:

```
import matplotlib.pyplot as plt
from matplotlib.figure import Figure
fig = plt.figure(figsize = (5, 4))
ax = fig.add_axes([1, 1, 1, 1])
ax1 = ax.plot([1, 2, 3, 4], [1, 2, 3, 4])
ax2 = ax.plot([1, 2, 3, 4], [2, 3, 4, 5])
plt.show()
```

Plotting Bar Charts:

```
import matplotlib.pyplot as plt
x = [3, 1, 3, 12, 2, 4, 4]
y = [3, 2, 1, 4, 5, 6, 7]
plt.bar(x, y)
plt.title("Bar Chart")
plt.legend(["bar"])
plt.show()
```



Plotting Pie Charts:

```
import matplotlib.pyplot as plt
x = [1, 2, 3, 4]
e  =(0.1, 0, 0, 0)
plt.pie(x, explode = e)
plt.title("Pie chart")
plt.show()
```