

9.	24/09/25	Implement Exceptions and Exception Handling in python
10.	24/09/25	Use the Matplotlib Module for Plotting in Python
11.	08/10/25	Use the Tkinter Module for UI design
12.	08/10/25	Simulate gaming concepts Using pygame

Task-10. Matplotlib module for plotting in Python

Aim: To analyze the performance of students in different subjects using various charts (line, Bar and Pie) with the help Matplotlib in python.

Algorithm:-

1. Start the program
2. Import the matplotlib and numpy libraries.
3. Create a dataset for 5 students, and their marks in 3 subjects (math, science, english).
4. Line chart:
 - Plot Marks of all students for each subject
 - Add title, labels, legend and grid(1, 0.8)
5. Bar chart:
 - Calculate average marks for each Subject
 - Plot a bar chart comparing the averages
6. Pie chart:
 - Select one student apposed to programming friends and
 - Plot a pie chart showing the percentages of marks in each subject
 - Add all chart using plt.show()
7. End the program.

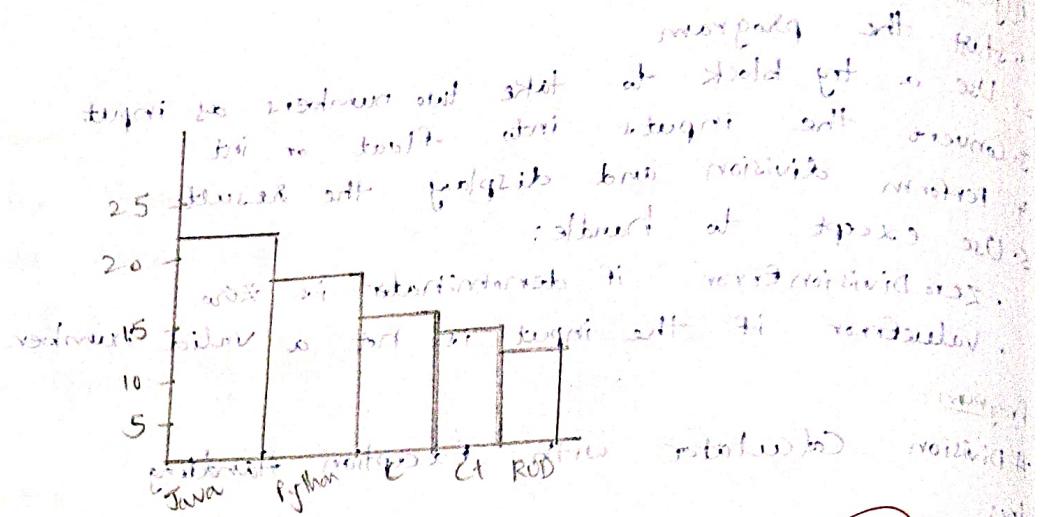
Program:-

```
import matplotlib.pyplot as plt
import numpy as np

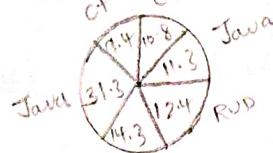
#Data
students = ['S1', 'S2', 'S3', 'S4', 'S5']
maths = [85, 78, 92, 76, 90]
science = [80, 75, 85, 68, 90]
english = [78, 82, 88, 72, 85]

plt.figure(figsize = (10, 6))
plt.plot(students, maths, marker = 'o', label = 'maths')
plt.plot(students, science, marker = 'o', label = 'science')
plt.plot(students, english, marker = 'o', label = 'English')
plt.plot(students, performance in different subjects')
```

• with starting with numbers with a few of
participants with perhaps no student from students with
highest library books used



Sample output: (language) total no. of books used
(language) total no. of books used
language used



(language) total no. of books used
language used

student interested other books (language) total no. of books used
language used

C++

language	total no. of books used
Java	100
Python	80
C	60
C++	60
PHP	40

student interested
other books

language total no. of books used
language used

language total no. of books used
language used

format of the program will be given at the end
(iii) how and what kind of analysis can be done
analyzing the different types of data sets.

Input:

Students: S1, S2, S3, S4, S5
Subjects: Maths, Science, English

Marks:

$$\text{Maths} = [85, 78, 92, 70, 88]$$

$$\text{Science} = [80, 75, 85, 68, 90]$$

$$\text{English} = [78, 82, 88, 72, 85]$$

Output:

- Line Chart: Marks of all 3 students across the 3 subjects
- Bar chart: Comparison of average marks per subject
- Pie chart: Distribution of marks across subjects for student 1.

$$[(85+78+92+70+88)/5] = 82.6 \text{ marks}$$

$$[(80+75+85+68+90)/5] = 79.6 \text{ marks}$$

$$[(78+82+88+72+85)/5] = 81.6 \text{ marks}$$

$$[(85+82+88+72+85)/5] = 83.0 \text{ marks}$$

$$((85-82)+(88-82)+(72-82)+(85-82)) = 12 \text{ marks}$$

(Student 1 has the maximum difference, 12 marks)

(Student 2 has the minimum difference, 12 marks)

(Student 3 has the maximum difference, 12 marks)

(Student 4 has the minimum difference, 12 marks)

```
plt.xlabel('Students')
```

```
plt.xlabel('Marks')
```

```
plt.legend()
```

```
plt.grid(True)
```

```
plt.show()
```

```
avg_marks = [np.mean(math), np.mean(science), np.mean(english)]
```

```
subjects = ['math', 'science', 'english']
```

```
plt.figure(figsize=(8,5))
```

```
plt.bar(subjects, avg_marks, color=['blue', 'green', 'orange'])
```

```
plt.title('Average marks of each subject')
```

```
plt.xlabel('Subjects')
```

```
plt.xlabel('Average Marks')
```

```
plt.grid(axis='y')
```

```
plt.show()
```

```
student_marks = [math[0], science[0], english[0]]
```

```
plt.figure(figsize=(6,6))
```

```
plt.pie(student_marks, labels=students, output_type='percentage')
```

```
plt.title('Percentage of marks for students')  
for '% I.I + % Q.Q', startangle=90)
```

```
plt.show()
```

VEL TECH - CSE	
EX NO.	10
PERFORMANCE (5)	5
RESULT AND ANALYSIS (5)	5
VIVA VOCE (5)	5
RECORD (5)	1
TOTAL (20)	15
SIGN WITH DATE	

Result:

The program successfully visualized the student's performance using matplot lib module.

15/6/25