2/9/25

Task:10 use matplotlib module for plotting in python

Aim:

To visualize and analyze the performance of students in three subjects using different types of charts (Line, Bar and pie) with the help of the matplotlib module in python.

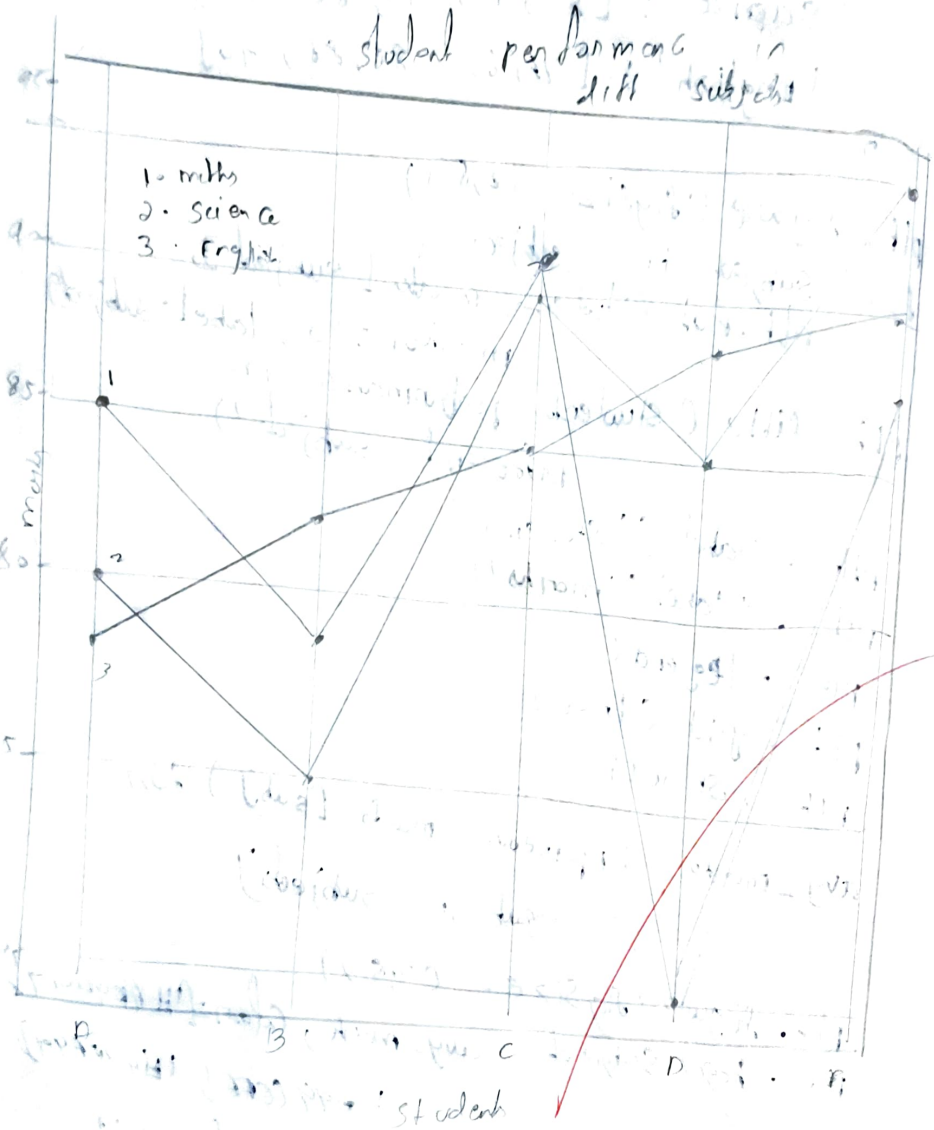
Algorithm:

1. Start the program
2. import required libraries
   - matplotlib.pyplot for plotting
   - numpy for calculating average
3. Initialize data for 5 students and 3 subjects
4. Plot line chart:
   - use plt.plot() to show marks of student in maths, science and english.
   - Add labels, title, legend and grid
5. Plot Bar chart:
   - calculate average marks of each subject using numpy.mean()
   - use plt.bar() to show the bar chart
6. Plot pie chart:
   - select one student
   - use plt.pie() to show percentage contribution of that student's mark across subjects
7. Display all chart using plt.show()
8. End the program

Program:

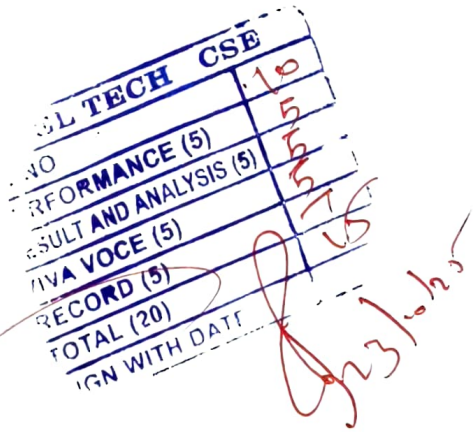
```
import matplotlib.pyplot as plt
import numpy as np
Students = ['A', 'B', 'C', 'D', 'E']
subjects = ['maths', 'science', 'English']
marks = {
    'Maths' : [85, 78, 92, 70, 88],
    'science' : [80, 75, 90, 85, 95],
    'English' : [70, 82, 85, 88, 90]
}
plt.figure(figsize=(8,5))
for subject in subjects:
    plt.plot(students, marks[subject],
             marker='o', label=subject)
plt.title('students performance in
          different subjects')
plt.xlabel('students')
plt.ylabel('marks')
plt.legend()
plt.grid(true)
plt.show()
avg_marks = [np.mean(marks[sub]) for
             sub in subjects]
plt.figure(figsize=(7,5))
plt.bar(subject, avg_mark, color=['#FF9999',
        '#99CCFF', '#99FF99'])
plt.title('Average marks of Each sub')
plt.xlable('subjects')
plt.ylable('Average Marks')
plt.grid(axis='y')
plt.show()
```

Output:


student performance in different subjects
1- maths
2- Science
3- English
marks
student

```
student_index = 0
student_marks = [marks[sub][student_index]
                 for sub in subjects]

plt.figure(figsize=(6,6))
plt.pie(student_marks, labels=subjects, autopct='%.1f%%',
        startangle=140, colours=['#FF4444', '#44FF44',
                                 '#4444FF']
plt.title(f'percentage contribution of marks
          for student {students[student_index]}')
plt.show()
```



Result:

The program successfully visualized student performance using matplotlib