RGM COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS) NANDYAL

RGM CODEQUEST '24 - 24Hr-HACKATHON

Team Name: MCA Team-5 (Web Titans)

Problem Statement: 2 - **Best-Performing Student Recognition System**

Solution Overview

In the project, the algorithm to determine the **Top 3 Students** is based on a calculated **Total Score** for each student. The total score is derived from four factors: **Year-End Marks**, **Achievements**, **Participation Certificates**, and **Other Activities**. Each factor is given a different weight, and the total score is computed by combining these weighted factors.

1. **Data Input**: Student data, including marks, achievements, certificates, and activities, is submitted via a form.
2. **Weighting of Factors**:
    - **Year-End Marks**: 60% of the total score
    - **Achievements**: 20% of the total score
    - **Participation Certificates**: 10% of the total score
    - **Other Activities**: 10% of the total score
3. **Score Calculation**: The total score for each student is computed using the formula:

"Total Score = (marks * 0.6) + (achievements * 0.2) + (certificates * 0.1) + (activities * 0.1)"

4. **Sorting**: After calculating the total score for each student, the students are sorted in descending order of their total scores.
5. **Top 3 Students Selection**: After sorting, the top 3 students are selected by picking the first three entries from the sorted list.

Algorithm Used

Sorting Algorithm:

- The list of students is sorted in descending order based on their total score using Python's built-in sorted() function with a custom sort key:

```
top_students = sorted(students, key=lambda x: x.total_score(), reverse=True)[:3]
```

- Here, lambda x: x.total_score() acts as the sorting key, ensuring that students are ordered based on their computed total score, with the highest score appearing first.

- reverse=True ensures that the list is sorted in descending order, with the top scorer at the beginning.
- [:3] selects the top 3 students from the sorted list.

Summary of Solution

The project uses a simple but effective **sorting-based algorithm** to determine the top 3 students. The solution involves:

1. **Collecting and weighting performance data**.
2. **Calculating a composite score for each student** based on the weighted factors.
3. **Sorting students** by their total score in descending order.
4. **Selecting the top 3 students** from the sorted list.

This approach ensures that the top 3 students are selected fairly based on multiple performance metrics rather than just marks alone, making it a holistic measure of student performance.