📊 Advanced Attendance Tracker (Python Console Application)

This console application is designed to help students track their class attendance across multiple subjects, perform predictive analysis (safe bunks), calculate potential bonus marks, and issue critical warnings regarding examination debarment.

✨ Key Features

This tracker goes beyond simple percentage calculation by incorporating advanced features and personalized feedback:

Feature	Description
Class-Wise Tracking	Allows input of attendance (Attended / Total) for individual classes via a seamless, interactive command-line interface.
Prediction & Bunk Safety	Calculates the maximum number of **consecutive classes** you can safely miss while maintaining the minimum target percentage (default 75%).
Debarment Warning	Issues a critical warning if overall attendance falls below the target, explicitly stating the user is **DEBARRED** from exams.
Required Attendance	When below the target, the report calculates the *exact* number of **consecutive classes** the student must attend to reach the minimum safe level.
Attendance Marks Scoring	Automatically awards marks (0-5) based on the following attendance tiers: - **5 Marks:** $\geq 95\%$ - **4 Marks:** $90\% - < 95\%$ - **3 Marks:** $85\% - < 90\%$ - **2 Marks:** $80\% - < 85\%$ - **1 Mark:** $75\% - < 80\%$
Actionable Suggestions	Provides personalized guidance based on the student's overall status (e.g., "Keep up the excellent work" or "Attend the next 15 classes").

🚀 How to Run

Prerequisites

You need **Python 3.x** installed on your system. No external libraries are required, as the script only uses the built-in `math` module.

Execution

1. Save the code as `attendance_tracker.py` .

2. Open your terminal or command prompt (VS Code Terminal is recommended).

3. Navigate to the directory where you saved the file.

4. Run the script using the Python interpreter:

```
python attendance_tracker.py
```

📝 Usage (Interactive Data Entry)

The script will guide you through the data entry process interactively:

1. When prompted for the **Class Name**, enter the subject (e.g., "Thermodynamics").

2. Enter the **classes attended** (e.g., `35`).

3. Enter the **total classes held** (e.g., `40`).

4. Repeat this process for all your subjects.

5. When you are finished entering classes, type `done` when prompted for the Class Name.

The script will then calculate and print the comprehensive report to your console.

🛠️ Critical Calculation Logic

The script uses specific mathematical formulas to provide accurate predictions:

1. Attendance Percentage (P)

$$
P = \frac{A}{C} \times 100
$$

- A: Total Attended Classes
- C: Total Classes Held

2. Max Safe Bunks (B_{max})

This determines how many classes (B) can be missed while keeping the new percentage ($\frac{A}{C+B}$) above the Target ($\frac{T}{100}$).

$$B_{max} = \lfloor \frac{A \times 100}{T} \rfloor - C$$

- The result is floored ($\lfloor ... \rfloor$) because you cannot attend a fraction of a class.

3. Required Attendance to be Safe (R)

If $P < T$, this calculates the minimum number of *consecutive* future classes (R) that must be attended to meet the target.

$$R = \lceil \frac{C \times T - A}{1 - T} \rceil$$

- T: Target Percentage (as a decimal, e.g., 0.75)