

# Attendance Report Generator - Documentation

## Overview:

This project is a C++ program that dynamically generates attendance reports using object-oriented programming concepts such as inheritance and polymorphism. It works with arrays of attendance records and supports two report types.

## Features:

- AttendanceRec struct to store student data and attendance status.
- Abstract class ReportBase for a common report interface.
- Two derived classes: DailyReport and MonthlyTrendReport.
- Pointer arithmetic and dynamic memory management.
- Functions to add and remove attendance records dynamically.

## 1. Data Structures

struct Date:

Represents a date with day, month, and year.

struct AttendanceRec:

Contains studentID (char array), pointer to Date, and a boolean indicating presence.

## 2. ReportBase Class (Abstract)

Defines a virtual function:

```
virtual void generate(const AttendanceRec* recs, int n) = 0;
```

This allows derived classes to implement different report generation strategies.

### 3. Derived Classes

DailyReport:

Counts and prints how many students were present.

MonthlyTrendReport:

Analyzes which days of the month had attendance and prints the count per day.

### 4. Memory Management

Records are dynamically stored in AttendanceRec\* arrays. These are resized during record addition or removal.

### 5. Functions

addRecord:

Takes a reference to the array, its size, and a new record to add. Resizes and adds the new record.

removeRecord:

Removes a record at a given index and resizes the array.

### 6. Sample Output

Daily Report: 3 students were present.

Monthly Trend Report:

Day 1: 1 present

Day 2: 1 present

Day 3: 1 present