

CGPA Calculator in C++

```
#include <iostream>
#include <vector>
#include <iomanip>
using namespace std;

int main() {
    int numCourses;
    float totalCredits = 0.0, totalGradePoints = 0.0;

    cout << "Enter the number of courses: ";
    cin >> numCourses;

    vector<float> grades(numCourses);
    vector<int> credits(numCourses);

    cout << "\n--- Enter course details ---\n";

    for (int i = 0; i < numCourses; ++i) {
        cout << "\nCourse " << i + 1 << ":\n";
        cout << "Enter grade (e.g., 10 for A+, 9 for A, etc.): ";
        cin >> grades[i];

        cout << "Enter credit hours: ";
        cin >> credits[i];

        totalCredits += credits[i];
        totalGradePoints += grades[i] * credits[i];
    }

    // Displaying each course info
    cout << "\n--- Course Summary ---\n";
    cout << fixed << setprecision(2);
    for (int i = 0; i < numCourses; ++i) {
        cout << "Course " << i + 1 << ": Grade = " << grades[i]
            << ", Credit Hours = " << credits[i]
            << ", Grade Points = " << grades[i] * credits[i] << endl;
    }

    if (totalCredits == 0) {
        cout << "\nTotal credits cannot be zero. CGPA cannot be calculated." << endl;
    } else {
        float cgpa = totalGradePoints / totalCredits;
        cout << "\nTotal Credits: " << totalCredits << endl;
        cout << "Total Grade Points: " << totalGradePoints << endl;
        cout << " Final CGPA: " << cgpa << endl;
    }

    return 0;
}
```

Sample Output:

Enter the number of courses: 3

--- Enter course details ---

Course 1:

Enter grade (e.g., 10 for A+, 9 for A, etc.): 9

Enter credit hours: 3

Course 2:

Enter grade (e.g., 10 for A+, 9 for A, etc.): 8

Enter credit hours: 4

Course 3:

Enter grade (e.g., 10 for A+, 9 for A, etc.): 10

Enter credit hours: 2

--- Course Summary ---

Course 1: Grade = 9.00, Credit Hours = 3, Grade Points = 27.00

Course 2: Grade = 8.00, Credit Hours = 4, Grade Points = 32.00

Course 3: Grade = 10.00, Credit Hours = 2, Grade Points = 20.00

Total Credits: 9.00

Total Grade Points: 79.00

Final CGPA: 8.78