**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