



# **COMPUTER PROGRAMMING**

## **PROJECT SP-24**

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# PROJECT REPORT: CGPA CALCULATOR

## Introduction

### Project Overview

The CGPA (Cumulative Grade Point Average) calculator is a software tool designed to help students calculate their GPA for the current semester and their cumulative GPA over multiple semesters. The application takes input for grades and credit hours for the current semester and the GPA of previous semesters to compute the overall CGPA.

### Objectives

To develop a user-friendly tool that assists students in calculating their GPA and CGPA.

To ensure accurate calculation of GPA and CGPA based on input data.

To manage memory efficiently using dynamic memory allocation in C++.

## METHODOLOGY

### Inputs:

Number of previous semesters.

GPA for each of the previous semesters.

Grades (A, B, C, D, F) and credit hours for each subject in the current semester.

### Outputs:

GPA for the current semester.

CGPA considering all semesters.

### Formulae

**GPA Calculation:** The GPA is calculated as a weighted average of the grade points, with each grade being assigned a numerical value (A=4.0, B=3.0, C=2.0, D=1.0, F=0.0). The formula used is:

$$GPA = \frac{\sum (Grade\ Points \times Credit\ Hours)}{\sum Credit\ Hours}$$

**CGPA Calculation:** The CGPA is calculated by considering the GPA and calculating average.

## IMPLEMENTATION

**Calculate\_GPA Function:** This function calculates the GPA for the current semester by converting grades to grade points and computing the weighted average based on credit hours.

**Calculate\_CGPA Function:** This function calculates the CGPA by averaging the GPAs of all semesters weighted by their respective credit hours.

### Input Handling:

The user inputs the number of previous semesters.

The GPA and credit hours for each previous semester are collected.

The grades and credit hours for the current semester are collected.

**Error Handling:** The program checks for invalid grades and zero credit hours to prevent errors.

## 4.RESULTS

The output is displayed clearly, providing the user with their GPA and CGPA.

## 5. CONCLUSION

This CGPA calculator is a useful tool for students to track their academic performance over multiple semesters. The program efficiently handles user input, performs accurate calculations, and ensures memory is managed correctly.