Student CGPA Management System

NORTHERN UNIVERSITY

Knowledge for Innovation and Change

CGPA Calculation REPORT

Computer Science and Engineering
CSE-1290 Software Development I

Submitted To

Tasfia Tabassum Faija
Lecturer, Department of Computer Science and Engineering
Northern University Bangladesh

Submitted By

Name: Yeamin Khan Dimon
Student Id: 4225010222
Name: Ajifa Afros
Student Id: 4225010225
Name: Depa Rani Job
Student Id: 42250102259

Abstract:

This project presents the development of a Student CGPA Management System in C. The system is designed to calculate the CGPA of students automatically based on subject-wise credits and grade points. It also converts grade points into corresponding grade letters and generates detailed reports for each student. A search option is provided to find the report of a specific student using the roll number. The system supports multiple students at the same time, ensuring quick and accurate results.

The project reduces manual effort in CGPA calculation and ensures efficiency, accuracy, and reliability. However, the current implementation only supports data storage for a single semester and the data remains in memory without file storage. Despite these limitations, the system proves to be a simple, fast, and useful tool for academic CGPA management.

Acknowledgment:

First and foremost, we would like to express our heartfelt gratitude to our course instructor, Tasfia Tabassum Faija, for her invaluable guidance, constant support, and encouragement throughout the course of this project. Without her sincere efforts and advice, the successful completion of this work would not have been possible.

We are also deeply thankful to our group members for their hard work, teamwork, and dedication. In addition, we sincerely acknowledge the helpful resources from various online platforms, which enabled us to gain a better understanding of important concepts such as structures and array operations in C programming.

Introduction:

The Student CGPA Management System in C is developed to calculate students' CGPA automatically based on subject credits and grade points. It reduces manual effort, minimizes calculation errors, and generates detailed reports with grade letters. The system also allows quick searching of student results by roll number, making it simple, efficient, and reliable for academic use.

Problem Statement:

In many academic institutions, calculating a student's CGPA is done manually, which is time-consuming and prone to human errors. Managing records for multiple students becomes difficult without an automated system. There is also no quick way to search and generate detailed reports for individual students.

To solve these issues, a Student CGPA Management System in C is required that can automatically calculate CGPA, generate reports, and provide fast and accurate results.

Motivation:

The primary motivation behind this project was to develop a system that closely simulates real-world applications. As C programmers, we aimed to enhance our understanding of structured programming principles, improve our problem-solving abilities, and gain practical experience in designing efficient and organized programs.

Objects:

The main objectives of this project are:

1. To develop a system that automatically calculates students' CGPA based on subject credits and grade points.
2. To minimize manual calculation errors and save time.
3. To generate detailed reports including grade letters and CGPA.
4. To provide a quick search option for retrieving student results by roll number.
5. To create a simple, efficient, and user-friendly academic result management tool.

2.Methodology / Implementation:

Tools & Technologies:

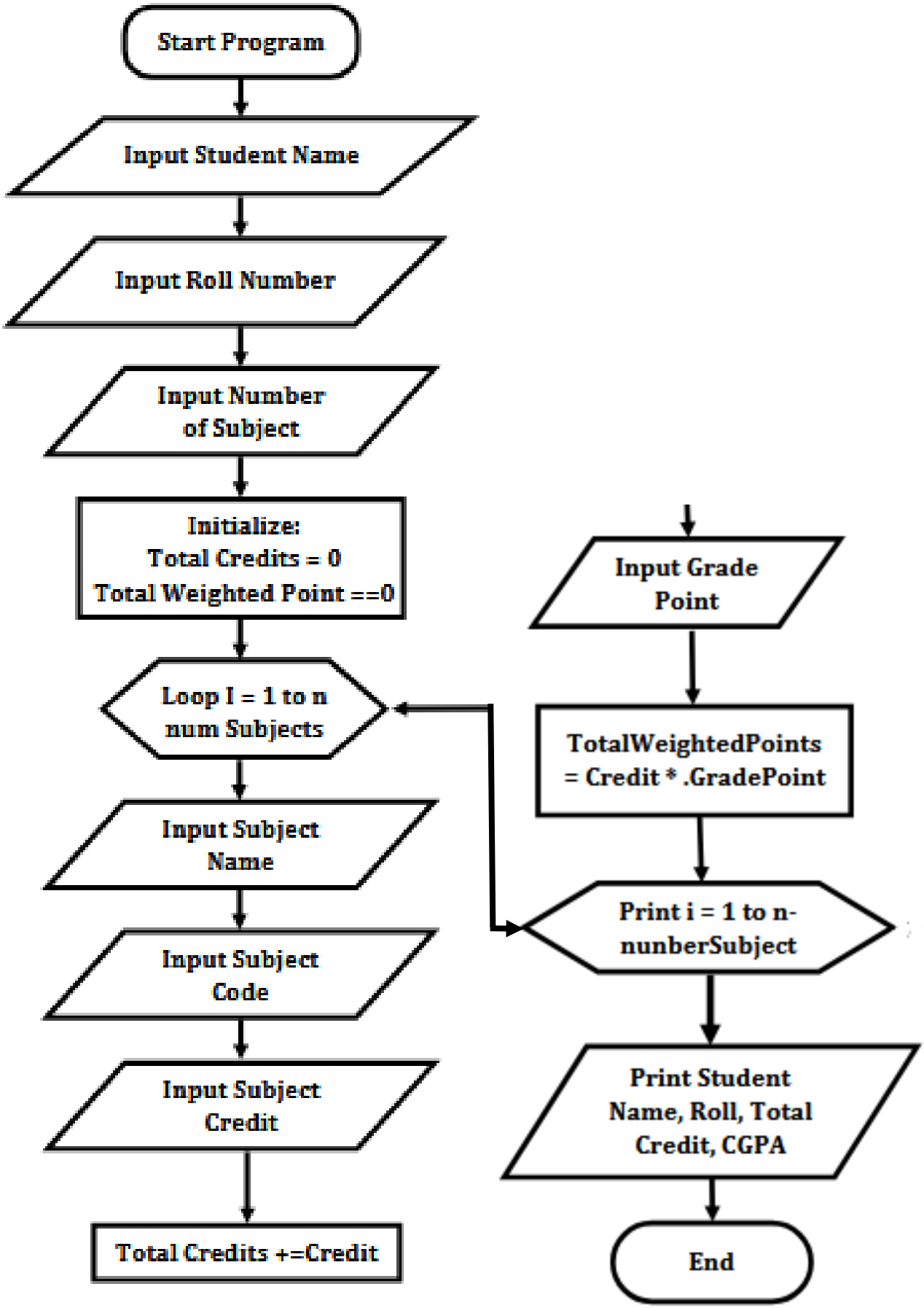
- Language: C
- Compiler: GCC / Code: Blocks
- Platform: Windows 10 Pro

Implementation Steps:

The system has been implemented in the C programming language. The development process followed these steps:

1. Input Stage – The program first takes subject information such as subject code, credit, and grade points.
2. Student Data Entry – User enters student details including name, roll number, and grades.
3. Processing Stage –Grade points are converted into corresponding grade letters. CGPA is calculated automatically based on subject credits and grade points.
4. Report Generation – The program displays each student's details, subject-wise results, and overall CGPA with grade letter.
5. Search Feature – Users can search for a student's report instantly by roll number. The implementation ensures accuracy, quick calculation, and easy access to results for multiple students.

System Design Diagram:



Simple Output:

```
Enter number of subjects: 5

Subject 1:
Enter subject name: Structured Programming Language
Enter subject code: CSE 1102
Enter credit for subject: 3.0

Subject 2:
Enter subject name: Structured Programming Language Lab Work
Enter subject code: CSE 1157
Enter credit for subject: 1.0

Subject 3:
Enter subject name: English II
Enter subject code: ENG 1204
Enter credit for subject: 3.0

Subject 4:
Enter subject name: Mathematics I
Enter subject code: MATH 1101
Enter credit for subject: 3.0

Subject 5:
Enter subject name: Physics II
Enter subject code: PHY 1302
Enter credit for subject: 3.0

----- Student Information -----
Enter student name: Md, Yeamin Khan Dimon
Enter student roll number: 42250102224
Enter grade point for Structured Programming Language : 3.25
Enter grade point for Structured Programming Language Lab Work: 3.25
Enter grade point for English II: 2.75

Enter grade point for Mathematics I : 2.75
Enter grade point for Physics II : 2.5

----- Student CGPA Report -----
Name        : Md, Yeamin Khan Dimon
Roll        : 42250102224
Total Credit : 13.00
CGPA        : 2.85
Grade Letter : B-

Subject Details:
Subject 1:
  Name        : Structured Programming Language
  Code        : CSE 1102
  Credit      : 3.00
|  Grade Point  : 3.25
  Grade Letter : B+

Subject 2:
  Name        : Structured Programming Language Lab Work
  Code        : CSE 1157
  Credit      : 1.00
```

Grade Point : 3.25
Grade Letter : B+

Subject 3:
Name : English II
Code : ENG 1204
Credit : 3.00
Grade Point : 2.75
Grade Letter : B-

Subject 4:
Name : Mathematics I
Code : MATH 1101
Credit : 3.00
Grade Point : 2.75
Grade Letter : B-

Subject 5:
Name : Physics II
Code : PHY 1302
Credit : 3.00
Grade Point : 2.50
Grade Letter : C+

Do you want to add another student? (yes/no): yes

----- Student information -----
Enter student name: Depa Rani Joba
Enter student roll number: 42250102259
Enter grade point for Structured Programming Language: 3.75
Enter grade point for Structured Programming Language Lab Work: 3.75
Enter grade point for English II: 3.0
Enter grade point for Mathematics I : 3.0
Enter grade point for Physics II : 3.0

----- Student CGPA Report -----
Name : Depa Rani Joba
Roll : 42250102259
Total Credit : 13.00
CGPA : 3.23
Grade Letter : B

Subject Details:
Subject 1:
Name : Structured Programming Language
Code : CSE 1102
Credit : 3.00
Grade Point : 3.75
Grade Letter : A

Subject 2:
Name : Structured Programming Language Lab Work
Code : CSE 1157
Credit : 1.00

```
  Grade Point  : 3.75
  Grade Letter : A

Subject 3:
  Name        : English II
  Code        : ENG 1204
  Credit      : 3.00
  Grade Point  : 3.00
  Grade Letter : B

Subject 4:
  Name        : Mathematics I
  Code        : MATH 1101
  Credit      : 3.00
  Grade Point  : 3.00
  Grade Letter : B

Subject 5:
  Name        : Physics II
  Code        : PHY 1302
  Credit      : 3.00
  Grade Point  : 3.00
  Grade Letter : B

Do you want to add another student? (yes/no): yes

----- Student information -----
Enter student name: Ajif Afrose
Enter student roll number: 42250102251
Enter grade point for Structured Programming Language: 3.50
Enter grade point for Structured Programming Language Lab Work: 3.50
Enter grade point for English II : 3.0
Enter grade point for Mathematics I : 3.0
Enter grade point for Physics II : 3.0

----- Student CGPA Report -----
Name        : Ajif Afrose
Roll        : 42250102251
Total Credit : 13.00
CGPA        : 3.15
Grade Letter : B

Subject Details:
Subject 1:
  Name        : Structured Programming Language
  Code        : CSE 1102
  Credit      : 3.00
  Grade Point  : 3.50
  Grade Letter : A-

Subject 2:
  Name        : Structured Programming Language Lab Work
  Code        : CSE 1157
  Credit      : 1.00
```

Grade Point : 3.50
Grade Letter : A-

Subject 3:
Name : English II
Code : ENG 1204
Credit : 3.00
Grade Point : 3.00
Grade Letter : B

Subject 4:
Name : Mathematics I
Code : MATH 1101
Credit : 3.00
Grade Point : 3.00
Grade Letter : B

Subject 5:
Name : Physics II
Code : PHY 1302
Credit : 3.00
Grade Point : 3.00
Grade Letter : B

Do you want to add another student? (yes/no): no

Enter roll number to search student CGPA (or type exit to quit): 42250102259

----- Student CGPA Report -----
Name : Depa Rani Joba
Roll : 42250102259
Total Credit : 13.00
CGPA : 3.23
Grade Letter : B

Subject Details:
Subject 1:
Name : Structured Programming Language
Code : CSE 1102
Credit : 3.00
Grade Point : 3.75
Grade Letter : A

Subject 2:
Name : Structured Programming Language Lab Work
Code : CSE 1157
Credit : 1.00
Grade Point : 3.75
Grade Letter : A

Subject 3:
Name : English II
Code : ENG 1204
Credit : 3.00

```
  Grade Point  : 3.00
  Grade Letter : B

Subject 4:
  Name        : Mathematics I
  Code        : MATH 1101
  Credit      : 3.00
  Grade Point  : 3.00
  Grade Letter : B

Subject 5:
  Name        : Physics II
  Code        : PHY 1302
  Credit      : 3.00
  Grade Point  : 3.00
  Grade Letter : B

Enter roll number to search student CGPA (or type exit to quit): exit
Exiting search mode...

Process returned 0 (0x0)   execution time : 352.211 s
Press any key to continue.
```

User Interface Menu:

When the program runs, the following menu is displayed to the user:

1. Add Student Information – Enter student name, roll number, subjects, credits, and grade points.
2. Calculate CGPA – Automatically calculate CGPA based on entered data.
3. Generate Report – Display detailed student result with grade letters and CGPA.
4. Search Student by Roll Number – Retrieve specific student's report instantly.
5. Exit Program – Close the application.
6. This menu provides a simple and user-friendly interface to manage multiple students efficiently.

Error Handling & Validation:

1. Mention how you validate inputs:
2. Numeric input validation for grade points and credits
3. Prevent array overflow
4. Check file operations
5. Validate search input

Results & Discussion:

The implementation of the Student CGPA Management System in C successfully achieved its objectives. The system can take student details, subject credits, and grade points, then automatically calculate the CGPA and generate a detailed report. The grade points are correctly converted into grade letters, and the search feature allows quick retrieval of student results by roll number.

The results show that the system saves time and reduces errors compared to manual calculation. It is simple to use and works efficiently for multiple students. However, the current version has some limitations, such as lack of permanent data storage and support for only one semester at a time. These issues can be improved in future versions with file handling, GUI, and database support.

Application & Future Scope:

This project can be applied in schools, colleges, and universities to calculate students' CGPA quickly and accurately, reducing manual effort and errors. In the future, the system can be improved by adding file storage, semester-wise calculations, and a graphical user interface. It can also be extended to provide online result access and secure login features, making it more practical and user-friendly.

Conclusion:

The Student CGPA Management System in C provides a simple and efficient way to calculate and manage student results. It reduces manual errors, saves time, and generates accurate reports. Although the current version has limited features, it can be enhanced in the future with file storage, GUI, and online accessibility, making it more practical for real academic use.

Reference:

References
- https://www.programiz.com/c-programming
- ChatGPT
-https://www.youtube.com