# Project Proposal

Group Number: [Group 10]

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## 1. Project Title & Group Members

Project Title: Student Grade Management System

Group Members:

- Sierra Howe (Student ID: 3485365)

- Juanita-Christene Adigwe (Student ID: 3745792)

## 2. Project Overview

The Student Grade Management System simplifies the organization of student data and the computation of grades and GPA. The intended purpose of the system is to let users store and update student’s data, sort the student records, visualize the student’s GPA performance using ASCII bar charts, and import or export student information through CSV files all while using linked lists for proper data management.

## 3. Key Features & Functionality

- **Feature 1: Student Data Management**: The system allows users to manage student data, including student ID, name, grades, and GPA. Users can add, update, or remove student records.

**User Interaction:**

* + - The system automatically calculates and updates the GPA when grades are added or modified.
    - Users can view a list of all students and their details

**-Feature 2: CSV File Import/Export**: The system supports reading student data from a CSV file and writing updated data back to a CSV file.

* + **User Interaction:**
    - Users can import student data from a CSV file.
    - After making changes users can export the updated data to a new CSV file (e.g., updated\_students.csv).

-**Feature 3: Dynamic GPA Calculation**: The system automatically calculates the GPA for each student based on their grades.

* + **User Interaction:**
    - When grades are added or modified, the system recalculates the GPA.
    - Users can view the GPA for each student alongside their grades.

**-Feature 4: Sorting Students**: The system allows users to sort students by ID, name, or GPA.

* + **User Interaction:**
    - Users can select a sorting criterion from a menu.
    - The system displays the sorted list of students without modifying the original data.

-Feature 5: The system generates horizontal bars for grades and allows student searching by name or ID.

* + **User Interaction:**
    - A Bar Chat is generated with the students’ classes associated with their grades.
    - Users can select how they would like to search, by name or ID.

## 4. Challenges & Potential Issues

Complexity of Handling CSV Files: Correctly parsing and formatting CSV data can be difficult. Solution: Put in place thorough testing for the functioning of CSV import and export.

Effective Searching & Sorting: Using linked lists to implement sorting and searching could be challenging. Solution: To maximize efficiency, employ recursive and iterative methods.

Management of Memory and Linked Lists: It is easy to make mistakes when managing memory allocation and deallocation for linked lists. Solution: Put in place appropriate memory management and confirm with thorough testing.

## 6. Work Plan & Timeline

Outline your project plan by breaking it into milestones. The key requirement is to demonstrate enough progress in the midway report and complete the project by the final deadline.

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| Week | Planned Task |
| Week 8 | Project Setup, Create Make File, Define Student Struct, Implement CSV File Handling, Dynamic GPA Calculation, Unit Testing |
| Week 10 | Implement Sorting, implement Sorting choice for users, Unit Testing |
| Week 11 | Generate ASCII Horizontal Bar Chart, Implement Searching by Name or ID, Testing and Debugging |
| Week 12 | Implement Linked Lists for Student Storage, adjust sorting with Linked Lists, Improve search efficiency, Finalize memory validation |
| Week 13 | Implement Edge Case Testing, Presentation Preparation |

## 7. Conclusion

This project will reinforce fundamental programming principles like file handling, sorting algorithms, data structures, and dynamic memory management while offering a workable solution for maintaining student grades. Our goal is to provide a useful and effective student grade management system by effectively putting the intended features into practice.

## 8. References (If Applicable)

<https://www.google.com/search?q=csv+reading+and+writing+in+C&oq=csv+reading+and+writing+in+C&gs_lcrp=EgZjaHJvbWUyBggAEEUYOTIICAEQABgWGB4yCAgCEAAYFhgeMggIAxAAGBYYHjINCAQQABiGAxiABBiKBTINCAUQABiGAxiABBiKBTINCAYQABiGAxiABBiKBTIHCAcQABjvBTIKCAgQABiABBiiBDIHCAkQABjvBdIBCTEwMDkyajBqN6gCALACAA&sourceid=chrome&ie=UTF-8#fpstate=ive&vld=cid:d28017e3,vid:X1Fq59EQaXo,st:0>

* <https://www.google.com/search?q=csv+reading+and+writing+in+C&oq=csv+reading+and+writing+in+C&gs_lcrp=EgZjaHJvbWUyBggAEEUYOTIICAEQABgWGB4yCAgCEAAYFhgeMggIAxAAGBYYHjINCAQQABiGAxiABBiKBTINCAUQABiGAxiABBiKBTINCAYQABiGAxiABBiKBTIHCAcQABjvBTIKCAgQABiABBiiBDIHCAkQABjvBdIBCTEwMDkyajBqN6gCALACAA&sourceid=chrome&ie=UTF-8#fpstate=ive&vld=cid:d28017e3,vid:X1Fq59EQaXo,st:0>