Programming Fundamentals (PF)

Project Proposal

Project Title: Student Management System

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1. Introduction

The Student Management System (SMS) is a C-based software designed to efficiently store, manage, and retrieve student information. It aims to simplify the management of student records by allowing users to add, update, search, and delete student details through a menu-driven interface.

2. Objectives

• To develop a structured system for maintaining student data.
• To perform CRUD operations using arrays and functions.
• To ensure easy searching and modification of student records.
• To create a simple and interactive console interface.

3. Scope of the Project

This system is suitable for small institutions or departments for managing limited student data. It can later be extended to include file storage, GUI, or database connectivity.

4. Functional Requirements

The system performs the following operations:
• Add Student Details: Input new records ensuring unique roll numbers.
• View Records: Display all stored student data.
• Search Student: Retrieve record by roll number.
• Modify Record: Update existing student details.
• Delete Record: Remove specific or all student records.
• Exit Program: Safely close the application.

5. Non-Functional Requirements

• User-Friendly: Menu-based console interface.
• Portable: Works on any system with a C compiler.
• Efficient: Uses array-based memory storage.
• Reliable: Prevents duplication of roll numbers.

6. Tools and Technologies

• Language: C
• Compiler: GCC / Turbo C / Code::Blocks
• IDE: Dev C++ or Visual Studio Code
• OS: Windows or Linux

7. System Design

The system uses arrays to store multiple attributes for each student such as name, department, roll number, GPA, email, and phone number. Each function (enter, search,

modify, delete) performs a dedicated role, ensuring modularity and maintainability.

8. Expected Outcomes

• Functional and interactive student record manager.
• Understanding of arrays, strings, and modular programming in C.
• Smooth data entry, update, and retrieval operations.

9. Future Enhancements

• Add file handling for permanent storage.
• Implement a graphical or web interface.
• Introduce login authentication and sorting features.

10. Conclusion

The Student Management System is a practical demonstration of structured programming and data management using C. It helps students learn key programming concepts through a hands-on project.