

Here's a proposal for your **Student Management System** in C++:

---

# Proposal: Student Management System in C++

## 1. Introduction

The **Student Management System (SMS)** is a console-based application designed to manage student records efficiently. This system allows users to **add, display, and search** for students using a simple menu-driven interface. It provides an organized way to store student data such as **ID, Name, and Marks**.

## 2. Objectives

The main objectives of this system are:

- ✓ Provide an easy-to-use interface for managing student records.
- ✓ Store student data efficiently using **arrays**.
- ✓ Allow users to search for students by their **ID**.
- ✓ Ensure **data integrity** through input validation.
- ✓ Offer a modular design using **functions** for better maintainability.

## 3. Features

**Add Student:** Allows users to enter a student's ID, Name, and Marks. Prevents adding more than the allowed limit.

**Display Students:** Shows all stored students in a formatted list.

**Search Student:** Finds a student by ID and displays their details.

**Exit:** Safely exits the program when the user chooses to quit.

## 4. Technical Specifications

- **Programming Language:** C++
- **Development Tools:** Any C++ compiler (GCC, MSVC, Clang)
- **Data Structure Used:** Array of structures
- **User Input Handling:** `cin, getline()`, input validation
- **Logic Flow:** Menu-driven using a `switch-case` inside a loop

## 5. Future Enhancements

To improve the system further, we can consider:

- ✓ **Using Vectors Instead of Arrays** for dynamic memory allocation.
- ✓ **Adding File Handling** to save student records permanently.

- ✓ **Implementing Sorting and Binary Search** for optimized searching.
- ✓ **Enhancing UI with a GUI Framework** like Qt or Tkinter.