Course: CSE-299 **Section:** 1 **Group Number:** 6

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Student Portal Management System

Abstract

The **Student Portal Management System** is designed to efficiently manage student data, academic records, and authentication processes through a **C++**-based application. This system features a secure login panel, an intuitive graphical user interface (GUI), a **CGPA calculator**, and an **Excel-based** storage solution for maintaining student records. By leveraging object-oriented programming principles and **Qt for GUI development**, this project aims to enhance accessibility, security, and accuracy in student information management. The proposal outlines the system's functionalities, technological stack, and implementation plan, ensuring a high-performance and scalable solution tailored to modern educational needs.

1. Introduction

The proposed system aims to:

1. Provide a **secure login panel** for students.
2. Maintain **student information records** (e.g., personal details, academic details, and contact information).
3. Develop an **automated CGPA calculator**.
4. Store and manage data using an **Excel file**.
5. Offer an intuitive **GUI** for seamless interaction.
6. Implement **C++-based object-oriented programming (OOP) principles** for efficiency and scalability.

2. Problem Statement

Managing student information manually is prone to errors, inefficiencies, and data security concerns. Traditional methods involve excessive paperwork, lack of centralized access, and difficulty in maintaining academic records. A well-designed **Student Portal Management System** will mitigate these issues by automating student record management, providing secure login access, and ensuring accurate CGPA computation. This proposal outlines the development of an efficient, user-friendly, and scalable system using **C++**.

3. Objectives

The proposed system aims to:

3.1 Provide a secure login panel for students.

3.2 Maintain student information records (e.g., personal details, academic details, and contact information).

3.3 Develop an automated CGPA calculator.

3.4 Store and manage data using an Excel file.

3.5 Offer an intuitive GUI for seamless interaction.

3.6 Implement C++-based object-oriented programming (OOP) principles for efficiency and scalability.

4. System Features

4.1 Student Information Management

- Full Name
- Date of Birth
- Student ID
- Email & Contact Number
- Address
- Course Details
- Semester & Enrollment Status
- Performance Records

4.2 Login Panel

- Secure authentication via username and password
- Role-based access control (e.g., students, administrators)

4.3 CGPA Calculator

- Accepts student grades for multiple courses
- Computes CGPA based on predefined formulas
- Displays the result in an intuitive manner

4.4 Data Storage & Management

- Stores student details and academic records in **Excel files**
- Ensures easy retrieval and updates of student data
- Provides an export function for record-keeping

5. Technology Stack

- **Programming Language:** C++ (Standard Template Library for efficient data handling)
- **Database:** CSV/Excel file integration using C++ file handling
- **GUI Framework:** Qt for cross-platform graphical user interface
- **Authentication:** Secure hashing algorithms in C++ for login security

6. Implementation Plan

Phase 1: System Design & Requirement Analysis

- Define system architecture
- Identify required functionalities

Phase 2: Development

- Build the GUI using **Qt for C++**
- Implement login authentication with secure hashing
- Develop student information storage using file handling techniques in C++
- Integrate the CGPA calculator

Phase 3: Testing & Debugging

- Perform unit testing on individual components
- Conduct user acceptance testing

Phase 4: Deployment & Maintenance

- Deploy the system on local machines
- Provide documentation for future updates

7. Expected Outcomes

- A centralized student data management platform
- A secure login system for students
- A fully functional CGPA calculator
- An Excel-based data storage system
- A high-performance system developed in **C++** with optimal memory management

8. Conclusion

The **Student Portal Management System** will offer a well-structured, user-friendly, and efficient solution for managing student records. The combination of GUI-based access, automated CGPA calculation, and Excel-based data storage ensures ease of use and high accuracy in student data management. The use of **C++** will provide an optimized, scalable, and secure system that meets modern educational needs. This proposal aims to develop and deploy a fully operational system that enhances student experience and administrative efficiency.

9. References:

- Chatgpt+