

# SMART CAMPUS MANAGEMENT SYSTEM

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## Introduction

This project is a C++ program developed as part of the CEA coursework. The project integrates Student Management, Faculty Management, and Library Management into a single system. It demonstrates the use of Object-Oriented Programming (OOP) concepts such as inheritance, classes, objects and encapsulation.

## Objectives

The main objectives of the project are:

1. To provide a simple system for managing student and faculty records.
2. To maintain a library system for registering, issuing, and returning books.
3. To calculate fines for late book returns.
4. To demonstrate the application of OOP principles in solving real-world problems.

## Student & Faculty Management

The system includes two main categories: Students and Teachers. Both are derived from the Person class.

- Student Class:

- Register student details such as ID, Name, Department, and Contact.
- Display and update student information.
- Search functionality based on student roll number.

- Teacher Class:

- Register teacher details with ID, Name, Department, and Contact.
- Display and update teacher information.

Additionally, the program contains a predefined list of 24CSE students with roll numbers and contact details.

## Library Management

The library system provides the following features:

1. Register new books with ISBN, Title, Author, and Copies.
2. Display registered books with full details.
3. Issue books to students or teachers and record the transaction time.
4. Return books with a system to enter the number of days the book was kept.
5. Calculate fine (\$1 per day) if a book is returned after the due date (15 days).

## **Working**

The program is menu-driven, guiding users through different management options. At the start, the user can choose between:

1. Student and Faculty Management
2. Library Management
3. Attendance System
4. Exit

Each section provides its own sub-menu. For example:

- Student and Faculty Management allows registration, updating, and displaying records.
  - Library Management allows book registration, issue, return, and fine calculation.
  - Attendance System allows students and teachers to digitally put their attendance of class.
- The program uses switch-case statements extensively for user interaction and menu navigation.

## **Technical Details**

1. Programming Language: C++
2. Concepts Used: Classes, Inheritance, Encapsulation, Switch-Case Statements, Functions.
3. Libraries Used: iostream, ctime.

## **Conclusion**

This project is a practical implementation of OOP concepts and showcases how C++ can be used to build small management systems. It combines academic and library operations into a single platform. The project also strengthens logical thinking by handling real-world problems such as record keeping, menu-driven navigation, and fine calculation.

Future improvements may include file handling for permanent data storage, graphical user interface (GUI), and database connectivity to make the system more scalable and user-friendly.