**THE NATIONAL UNIVERSITY OF COMPUTER AND EMERGING SCIENCES-FAST KARACHI**



**Course Name:**

OBJECT ORIENTED PROGRAMMING -LAB

**Title Of The Project:**

LEARNING MANAGEMENT SYSTEM

**Teacher:**

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**Project By:**

SAMAN

(23K-6078)

**Submission Date:**

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**Executive Summary**

**Overview:**

The Learning Management System (LMS) project aims to create a C++-based application that supports remote education by enhancing accessibility, interactivity, and personalized learning. The project was designed with dual interfaces tailored to both students and teachers, offering features such as lecture uploads, online quizzes, and user-friendly navigation.

**Key Findings:**

* Developed a fully functional C++ LMS application with dual interfaces.
* Ensured accessibility through native language content creation.
* Successfully integrated online assessments and content management.
* Aligned the system with Sustainable Development Goals (SDGs) related to education, innovation, and reduced inequalities.

**Introduction**

**Background:**

E-learning platforms are transforming traditional education by offering flexible, inclusive, and interactive learning environments. This project aligns with OOP principles by implementing core object-oriented concepts like encapsulation, inheritance, and polymorphism in a real-world application.

**Project Objectives:**

* Design a user-friendly LMS using C++ with clear segregation between student and educator roles.
* Ensure support for educational content delivery, assessments, and progress tracking.
* Promote SDG goals through digital inclusion and innovation in learning.

**Project Description**

**Scope:**

**Included Features:**

* Dual interface for teachers and students
* Registration/login system
* Lecture uploads
* Online quiz functionality
* User activity tracking

**Excluded Features:**

* Real-time video conferencing
* Mobile application version
* Third-party integrations

**Technical Overview:**

* Programming Language: C++
* IDEs Used: Embarcadero Dev C++, Visual Studio
* Resources: Static libraries, YouTube tutorials (MUMINJOON, Simplilearn)

**Methodology**

**Approach:**

The project was carried out using a weekly task-planning model. Progress was tracked against a project timeline, focusing on modular development and early testing of core functionalities.

**Roles and Responsibilities:**

**Saman (23K-6078):**

* Entire project development and design
* Interface development
* Integration of quizzes and content upload features
* Documentation and testing

**Project Implementation**

**Design and Structure:**

The application was built with two main modules:

* **Educator Module:** Allows content upload and quiz creation.
* **Student Module:** Enables students to access lectures, take quizzes, and view scores.

**Functionalities Developed:**

* User registration and login system
* Distinct dashboards for students and teachers
* Online quiz system
* Lecture management system

**Challenges Faced:**

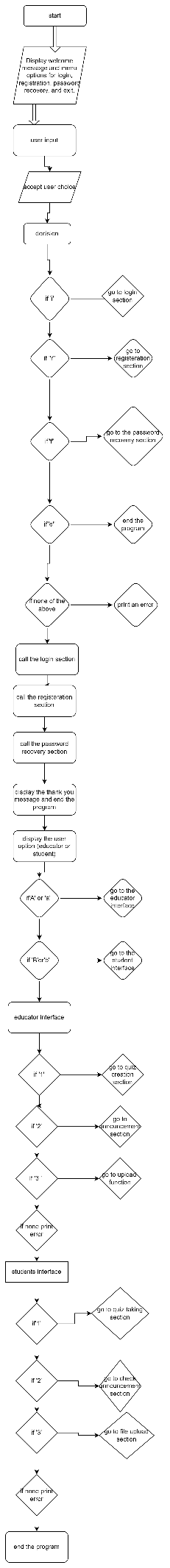
* **UI Design in C++:** Overcame limitations by focusing on command-line interface aesthetics.
* **Data handling:** Implemented simple file storage and retrieval mechanisms for user data and content.
* **Limited library support:** Relied on static libraries and online community support to implement key features.

**Results**

**Project Outcomes:**

* Delivered a stable and usable LMS application using C++.
* Successfully demonstrated the application of OOP principles in a practical scenario.
* Provided a scalable base for future enhancements such as database integration and GUI.

**Screenshots and Illustrations:**



**Testing and Validation:**

* Manual testing was conducted for all user flows.
* Edge cases like invalid logins, empty inputs, and multiple users were handled.
* Functional testing ensured each module performed its intended task.

**Conclusion**

**Summary of Findings:**

This project demonstrates how a C++ application can be used to simulate an educational platform, supporting the shift from traditional to digital learning methods. It fulfills the core goals of providing accessible, interactive, and flexible learning environments.

**Final Remarks:**

The LMS developed has the potential to be expanded further with GUI integration, database support, and mobile compatibility. This experience enhanced practical understanding of OOP and showed how technology can bridge educational gaps across the globe.