**PROJECT REPORT**

**Library Management System**

**Created By:**

Muhammad Zawahir Amin (FA23-BCE-075)

Muhammad Usman (FA23 -BCE-073)

The Library Management System (LMS) project aims to develop a software system that efficiently manages library resources and operations.

**Project Scope:**

The project includes the development of a desktop application for a library, allowing users to perform tasks such as adding, borrowing, and returning books and this also helps librarians in managing financial records and handling book transactions.

**Methodology:**

The development process follows a systematic approach, incorporating principles of software engineering and best practices in C++ programming. Regular code reviews and testing were conducted to ensure the reliability and robustness of the system.

**System Architecture:**

The Library Management System is structured using C++ and includes modular components for book management and transaction handling.

**Implementation Details:**

Key features of the implementation include structures for Book and Transaction, input validation, and file handling for persistent data storage. Functions for book addition, display, borrowing, returning, and transaction management were implemented to achieve the project's goals.

**Features and Functionality:**

The system offers the following features:

* Adding new books to the catalogue with unique IDs.
* Displaying available books with details.
* Allowing users to borrow and return books.
* Recording transactions and calculating fines for late returns.

**Testing:**

The testing phase involved rigorous validation of each function to ensure accurate and error-free performance. Test cases covered various scenarios, including edge cases and typical user interactions.

**Results and Outcomes:**

The Library Management System successfully meets its objectives, providing a reliable and user-friendly tool for library management. The system accurately records transactions and handles book availability efficiently.

**Conclusion:**

The project concludes with the successful implementation of the Library Management System, demonstrating proficiency in C++ programming and software development practices. The iterative development approach allowed for flexibility and adaptation to changing requirements.

**Future Work:**

Possible future enhancements include:

* Implementing user authentication for librarians.
* Developing a graphical user interface for improved usability.
* Integrating online catalogue features for broader accessibility.

**Acknowledgments:**

The authors would like to express gratitude to Dr. Arsla Khan for guidance and support throughout the project.

**References:**

* C++ Programming Language Documentation