**SYNOPSIS ON LIBRARY MANAGEMENT SYSTEM**

**BACHELOR OF TECHNOLOGY**

**IN**

**COMPUTER SCIENCE AND ENGINEERING**



**L.R. Institute of Engineering and Technology, Solan**

**Project Title**: Library Management System

**Company/Institute**: Excellence Technology-Hamirpur(HP)-177022

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**Purpose:-**

The purpose of this project is to automate and streamline library operations, enabling efficient management of books, librarians, and borrowing processes. The Library Management System reduces manual intervention and minimizes human error, ensuring a seamless experience for administrators and users alike.

**Scope:-**

The Library Management System is designed to:

* Cater to small and medium-sized libraries.
* Handle librarian management, book inventory, and issuance processes.
* Provide a secure and intuitive interface for library administrators.
* Enable future scalability with the ability to add more modules like member management or advanced reporting.

**Objectives:-**

* To create a secure system for managing librarian and book records.
* To provide real-time tracking of book availability, issued books, and returned books.
* To enhance the efficiency of library management with minimal manual intervention.
* To ensure data accuracy and integrity.

**Languages Used:-**

* **Frontend**:
  + Java Swing (for graphical user interface).
* **Backend**:
  + Core Java (for application logic and processing).
* **Database Management**:
  + SQL (to manage and query the database).

**System Design:-**

**ER Diagram**

* **Entities**:
  + **Admin**: Handles login and system operations.
  + **Librarian**: Contains details about librarians.
  + **Book**: Represents the books available in the library.
  + **Student**: Represents the borrowers.
  + **Issue**: Tracks book issuance and return processes.

**Relationships:**

* **Admin** can manage multiple **Librarians**.
* **Books** can be issued to multiple **Students** through an **Issue** record.
* **Books** and **Issues** are dynamically updated to reflect real-time inventory changes.

**Database Diagram:-**

* **Admin Table**
  + AdminID (Primary Key)
  + Username
  + Password
* **Librarian Table**
  + LibrarianID (Primary Key)
  + Name
  + Email
  + ContactNumber
* **Book Table**
  + BookID (Primary Key)
  + Title
  + Author
  + Quantity
  + IssuedCount
* **Issue Table**
  + IssueID (Primary Key)
  + BookID (Foreign Key)
  + StudentID
  + IssueDate
  + ReturnDate

**Implementation Overview:-**

1. **Login System**  
   Secure admin login using predefined credentials (admin, admin123).
2. **Librarian Management**  
   Add, view, and delete librarian records easily through an intuitive interface.
3. **Book Inventory Management**  
   Add new books, view book inventory, and update details dynamically.
4. **Book Issuance and Return**
   * Issue books to students and track their status.
   * Return books and ensure real-time updates to inventory.

**Conclusion:-**

The Library Management System is a robust and scalable solution tailored to meet the needs of modern library operations. It demonstrates effective use of core Java concepts and provides a practical framework for automating routine tasks. The project is a significant step toward enhancing operational efficiency and ensuring seamless user experiences in libraries.