



# Library Management System

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## Hackathon Submission

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**Use Case Title:**

Library Management System

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## **1. Problem Statement**

Libraries need efficient management systems to handle book lending, track borrowed books, and maintain an organized database of available books. The challenge is to develop a database system that efficiently manages library operations using SQLite 3.

## **2. Proposed Solution**

The proposed solution is to create a Library Management System using SQLite 3 that will include features like:

- Adding new books with details like title, author, genre, and availability status
- Tracking book loans, including issue and return dates.
- Monitoring overdue books and generating reports on late returns.
- Managing users, allowing students to borrow and return books efficiently.

## **3. Technologies & Tools Considered**

- SQLite 3
- SQL for query management and data retrieval
- ERD for designing database relationships

## **4. Database Schema & Data Flow**

The Library Management System will have the following tables:

1. **Books** – Book ID (Primary Key), Title, Author, Genre, ISBN (Unique), Availability Status
2. **Users** – User ID (Primary Key), Name, Contact Info, Membership Type
3. **Transactions** – Transaction ID (Primary Key), Book ID (Foreign Key), User ID (Foreign Key), Issue Date, Return Date, Status

### **Data flow:**

1. When a book is issued, a record is added to the Transactions table.



2. When a book is returned, the status is updated in both the Books and Transactions tables.

## **5. Feasibility & Challenges**

### **Feasibility:**

The solution is practical because SQLite 3 is lightweight and supports relational data efficiently.

### **Challenges:**

Ensuring data consistency and integrity using primary and foreign keys.  
Handling concurrent access and large datasets.

## **6. Expected Outcome & Impact**

The Library Management System will improve library operations by:

- Reducing manual work for library staff.
- Improving book tracking and reducing loss.
- Offering quick access to book availability and user history.

## **7. Future Enhancements**

- Integration with a mobile app for remote access.
- Notification system for overdue books.
- Adding a recommendation engine for book suggestions.