# Library Management System

**Hackathon Submission**

**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:**
4. When a book is issued, a record is added to the Transactions table.
5. 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.