# CS 665 Project 1 Proposal:

**MetaLib**: Community Library Management

System

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**Introduction**

In today’s digital age, libraries continue to be essential hubs for information, learning, and community engagement. To optimize library operations and enhance user experience, a modern Library Management System is crucial. This proposal outlines the development of a database-driven application, "**MetaLib**," designed to streamline library processes, efficiently manage resources, and foster seamless interaction between library staff and patrons.

**The Business/Story of Our Database**

MetaLib aims to transform a traditional library into a dynamic and accessible center for knowledge and community interaction. The database will be the core of this system, supporting vital functions such as:

* User registration and management
* Book cataloging and inventory control
* Circulation management (borrowing and returns)
* Event scheduling and promotion
* Fine management and reporting

This system will provide librarians with the tools to efficiently manage resources, track book availability, generate circulation reports, and automate tasks. Patrons will benefit from a user-friendly interface to search for books, reserve titles, manage their accounts, and stay informed about library events.

**Database Software Choice**

For this project, I have chosen **SQLite** as our relational database management system. SQLite offers advantages like portability, compatibility and simplicity that make it well-suited for this application.

**Database Tentative Schema**

The database will be structured using a relational model, with tables designed in Third Normal Form (3NF) to minimize data redundancy and ensure data integrity. The following tables are proposed:

1. **Users** (UserID, FirstName, LastName, Email, Password, Address, Phone, RegistrationDate, UserType)
2. **Books** (BookID, Title, Author, ISBN, PublicationYear, Genre, Publisher, Edition, NumberOfCopies)
3. **Book\_Status** (BookID, Status, Location)
4. **Borrowing** (BorrowID, UserID, BookID, BorrowDate, DueDate, ReturnDate)
5. **Fines** (FineID, UserID, BorrowID, FineAmount, FineDate, PaymentDate)
6. **Events** (EventID, EventName, EventDate, EventTime, Location, Description)

Relationships between tables will be defined using primary and foreign keys. For example, the Borrowing table will use foreign keys to link to the Users and Books tables. Triggers and stored procedures will be implemented to automate processes such as updating book availability and calculating fines.

**Programming Tools Choice**

The following programming tools have been selected for this project:

* **Language:** Python
* **Framework:**
* Backend: Flask
* Frontend: HTML/CSS
* **Database ORM:** SQL Alchemy

**Conclusion**

MetaLib will provide a comprehensive solution for modernizing library operations, enhancing user engagement, and promoting access to information. By utilizing SQLite, Python, and other modern technologies, this project will not only fulfill the requirements of the course but also offer a valuable tool for libraries to thrive in the digital age.