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Project Phase 3

I. Relational Model

Tables and Attributes

- **Book** (*Book_Id*, ISBN, Title, Shelf_Id)
- **User** (*User_Id*, Name, Email)
- **Recommendation** (*Recommend_Id*, User_Id)
    - **Primary Key**: Recommend_Id
    - **Foreign Key**: User_Id references **User(User_Id)**
- **Librarians** (*Emp_Id*, Name, Date_Emp, Role)
- **Search_Query** (*Query_Id*, User_Id, Keyword)
    - **Primary Key**: Query_Id
    - **Foreign Key**: User_Id references **User(User_Id)**
- **Executes** (*Query_Id*, User_Id)
- **Oversees** (*Emp_Id*, Query_Id)
- **Returns** (*Book_Id*, User_Id)
- **Has** (*User_Id*)
- **Borrow** (*Book_Id*, Due_Date, Borrow_Date, User_Id)
    - **Primary Key**: Book_Id
    - **Foreign Key**: Book_Id references **Book(Book_Id)**

II. Choice of Database, Software Platforms, and Languages

- **Database**: A relational database management system (RDBMS) such as SQL integrated with DBeaver will store book records, user information, and borrowing history.
- **Backend Development**: The server-side logic and database interactions will be handled using Python with Flask.
- **Frontend Development**: A web-based interface will be developed using Flutter, ensuring a seamless and user-friendly experience.
- **AI Recommendation System**: The machine learning library Scikit-Learn will implement an AI-based book recommendation system trained using historical borrowing patterns.

III. Data Sources and Collection

- **Book Information**: Titles, authors, genres, and availability status will be sourced from free online book databases such as Open Library and Project Gutenberg via their APIs. The data will be integrated into our Python system.

- **User Information**: Names, user IDs, and borrowing history will be collected during user registration and stored securely in the database.
- **Borrowing system**: The system automatically updates book checkouts, due dates, and return statuses as users borrow and return books.

IV. Division of Labor

- **Frontend**: Faith will do the front-end development of the project.
- **Backend**: Chioma will do the backend development of the project.
- **DataBase**: Both will contribute to the development of the database.
- **AI**: Both will train and implement the AI aspect of the project.

V. Project Timeline

- Frontend and backend should be completed near the end of March
- SQL should be completed by mid-April
- The full Project including AI implementation should be completed by the due date.