

Software Engineering Project

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Library Management System for Universities/Schools

1. Software design and modeling

1.1 User Roles

1. **Simple user (student, staff)** => Simple user can use the system to register, login, view/search for materials, borrow materials, and view their account information, review/suggest books.
2. **Admin (librarian)** => Admin can use the system to login, manage the library's inventory (add/delete/edit materials), view borrowed-returned materials, check renewals, give permissions on reviews/suggestions, check the users accounts, generate reports on the library's usage.

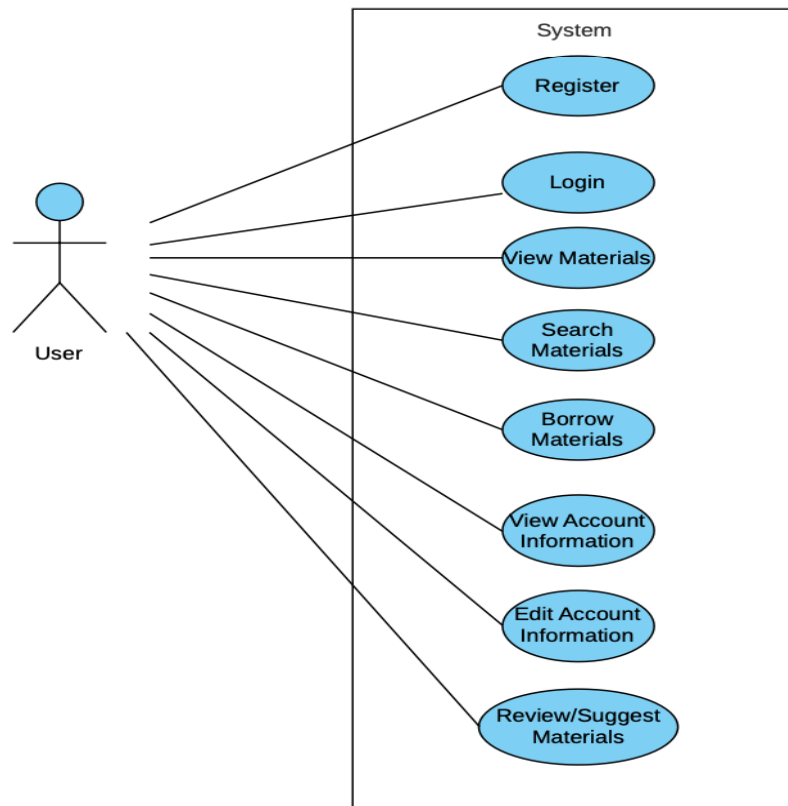


Figure 1 User Use Case Diagram



Figure 2 Admin Use Case Diagram

1.2 Database design

1. **Book table** => information about the materials in the library such as: book ID, title, author, publisher, year of publication, category, and quantity.
2. **Users table** => information about library user such as: user ID, first name, last name, email, phone number, and address.
3. **Reserve table** => information about book reservations made by users, including the reservation ID, user ID, book ID, and reservation date.
4. **Borrowed table** => information about borrowed books, including the borrow ID, user ID, book ID, borrow date, due date, and return date.

5. **Suggestions table** => information about book loans made by users, including the suggest ID, user ID, book ID, suggestion(text).

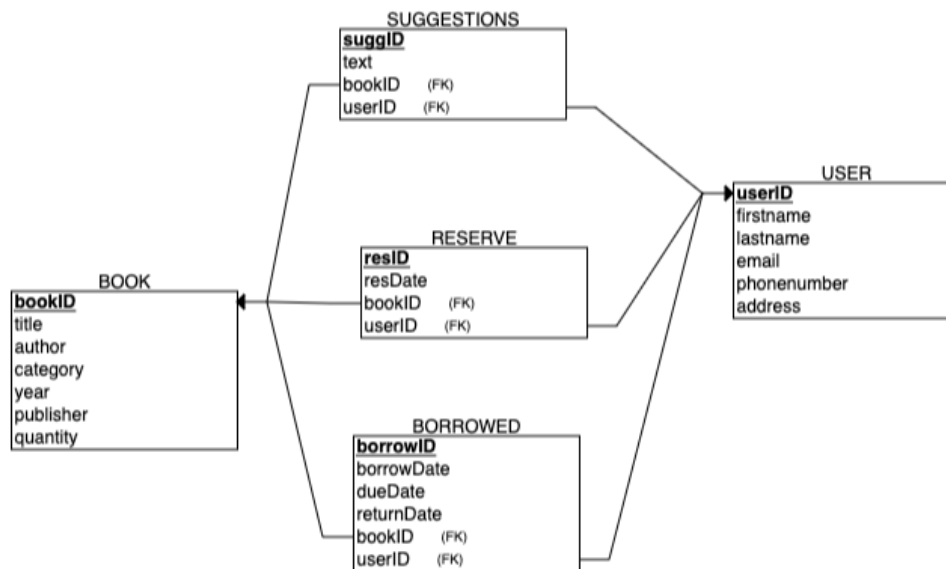


Figure 3 Database Design

1.3 User Interface

We aim to create a clean, simple and user-friendly interface in order to make the library's materials accessible to users, and to let them effectively manage their accounts, reservations and borrows. It should include:

- For all users (simple users+admin):
 1. Home=> a page that provides users a summary of the materials and functions that are offered. It should include a navbar to link it to other pages and a part where most borrowed books and suggestions can be viewed.
 2. Materials view=> a page that shows all the materials that are offered divided in categories, including the option to search for specific ones and reserve button to reserve books.
 3. Login/ Register forms => a page where the user can login or register.
 4. Account Information=>a page that allows users to view their information.

- For simple users:
 1. View borrowed books=> a page where simple users can view their history of borrowed books.
 2. Suggestion=> a page where users can leave their suggestions.
- For admin:
 1. View reservation books=> a page where the admin can the new reservations.
 2. View borrowed books=> a page where the admin can view all borrowed books from all users.
 3. Suggestion control=> a page where the admin can check suggestions.
 4. Material modification=> a page where the admin can add, delete and edit materials.
 5. View users=> a page where the admin can view and delete users.