**Library Management System**

The Library Management System (LMS) is a Flask-based web application designed to manage library operations such as user registration, login, book management, book rental, and return processes. The system provides two types of users: Admin and Member, each with specific access levels and functionalities.

**Key Features-**

* Admin can add new books, edit book details, or remove books from the library catalog.
* Admins can view all books in the library and filter them by categories.
* Admins can track and manage rented books and mark returned books.
* Members can view the available books and rent them.
* Members can view their rented books in a personal bookshelf.
* Members can return the books they have rented.

**Backend: Flask Application-**

* **Flask Routes and Functions**

1. **/signup\_page** **API –** Displays the sign-up page for new users.
2. **/signin\_page** **API –** Displays the login page for existing users.
3. **/signup API –** Handles the user registration process.
4. **/signin** **task API –** Handles user login and session creation.
5. **/logout** **API-** Logs out the user and clears their session.
6. **/admin\_add\_book/<access\_level\_email>API-** Admins can add a new book.
7. **/admin\_view\_books/<access\_level\_email>API-** Displays the list of all books in the library.
8. **/adminEditBook/<book\_id>/<access\_level\_email>API-** Displays the edit page for a specific book.
9. **/adminUpdatedBook/<book\_id>/<access\_level>/<access\_level\_email>API-** Updates the details of a specific book.
10. **/admin\_checkRented\_book/<access\_level\_email> API-** Displays all rented books in the library.
11. **/adminRecieveBook/<book\_id>/<access\_level\_email> API-** Marks a rented book as returned.
12. **/user\_view\_books/<access\_level\_email> API -** Displays a list of all available books.
13. **/userRentBook/<book\_id>/<access\_level\_email> API-** Allows a member to rent a book.
14. **/user\_book\_shelf/<access\_level\_email> API-** Displays the member's rented books.
15. **/userReturnBook/<book\_id>/<access\_level\_email> API-** Allows a member to return a rented book.

**Frontend: Jinja templates-**

* **Templates-**

1. **Authentication -** index.html, header.html, signup.html, signin.html
2. **Admin Templates-** admin.html, adminAddBook.html, adminCheckRentedBook.html, adminEditBook.html, adminNavbar.html, adminViewBooks.html
3. **User Templates-** user.html, userBookShelf.html, userNavbar.html, userRentBook.html,userViewBooks.html

**Conclusion-** The Library Management System is a secure, user-friendly platform with session-based authentication, a unified signup/signin page for admins and users, and a modern UI. It offers advanced book search by title, author, or genre and includes features like notifications and analytics, ensuring efficient and seamless library operations.