Library Management System

Library Management System is a system which maintains the information about the books present in the library, their authors, the members of library to whom books are issued, library staff and all. This is very difficult to organize manually. Maintenance of all this information manually is a very complex task. Owing to the advancement of technology, organization of an Online Library becomes much simple. The Library Management has been designed to computerize and automate the operations performed over the information about the members, book issues and returns and all other operations. This computerization of library helps in many instances of its maintenances. It reduces the workload of management as most of the manual work done is reduced.

1. Functionality requirements

   1. Normal user

1.1 User login

Description of feature

This feature used by the user to login into system. They are required to enter user id and password before they are allowed to enter the system .The user id and password will be verified and if invalid id is there user is allowed to not enter the system.

Functional requirements

* user id is provided when they register
* The system must only allow user with valid id and password to enter the system
* The system performs authorization process which decides what user level can access to.
* The user must be able to logout after they finished using system.

1.2 Register new User

Description of feature

This feature can be performed by all users to register new user to create account.

Functional requirements
* System must be able to verify information
* System must be able to delete information if information is wrong

1.3 Register new Book

Description of feature

This feature allows to add new books to the library

Functional requirements

- ❖ System must be able to verify information
- ❖ System must be able to enter number of copies into table.
- ❖ System must be able to not allow two books having same book id.

1.4 Search book

Description of feature

This feature is found in book maintenance part . we can search book based on book id ,book name , publication or by author name.

Functional requirements

- ❖ System must be able to search the database based on select search type
- ❖ System must be able to filter book based on keyword entered
- ❖ System must be able to show the filtered book in table view

Functional requirements

- ❖ System should be able to add detailed information about events .
- ❖ System should be able to display information on notice board available in the homepage of site

Proposed System:

To solve the inconveniences as mentioned in the existing system, an Online Library is proposed. The proposed system contains the following features:

- ✓ The students will register them through Online
- ✓ Individually each member will have his account through which he can access the information he needs.
- ✓ Book details like authors, number of copies totally maintained by library, present variable number of books, reference books, non-reference books etc. all this information can be made handy.
- ✓ Regarding the members designation, number of books was issued.
- ✓ Issue dates and returns of each member is maintained separately and fine charged if there is any delay in returning the book.
- ✓ Administrator can add, update the books.
- ✓ Time consuming is low, gives accurate results, reliability can be improved with the help of security.

2. **Software tools used**

The whole Project is divided in two parts the front end and the back end.

2.1. Front end

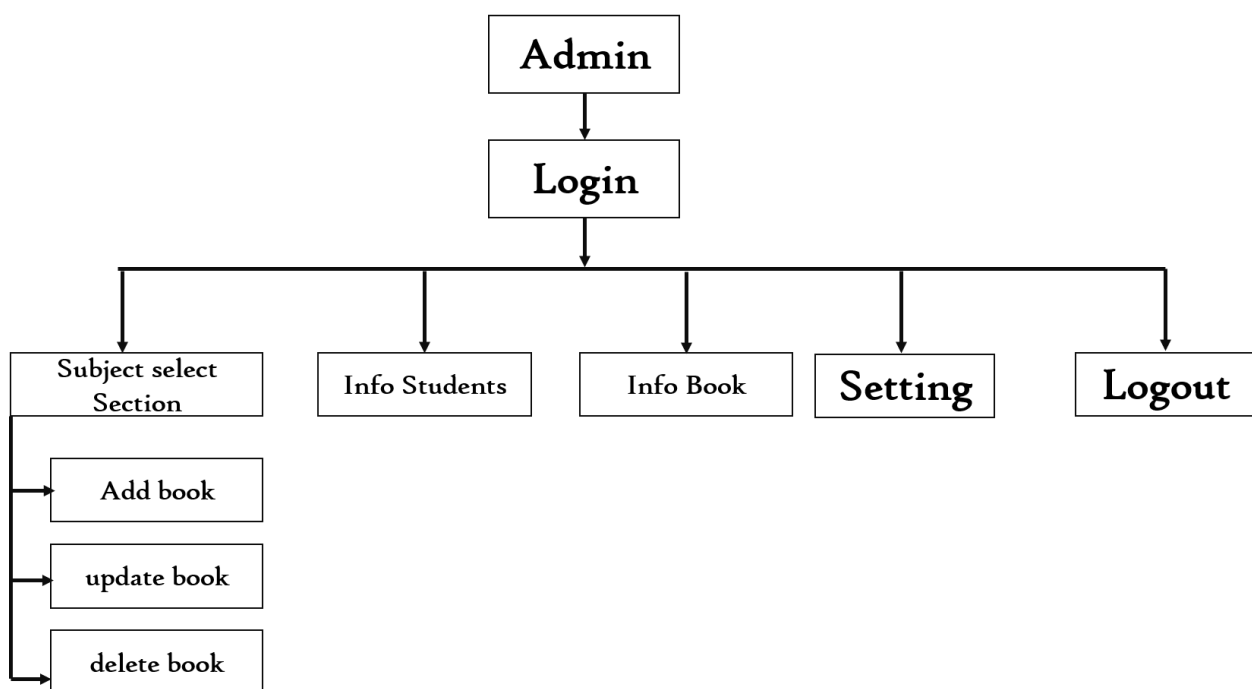The front end is designed using of HTML, CSS, Java script

2.2. Database: Postgresql

2.3. Back End: Java (Spring Boot)

System Design

3.1 **Table**

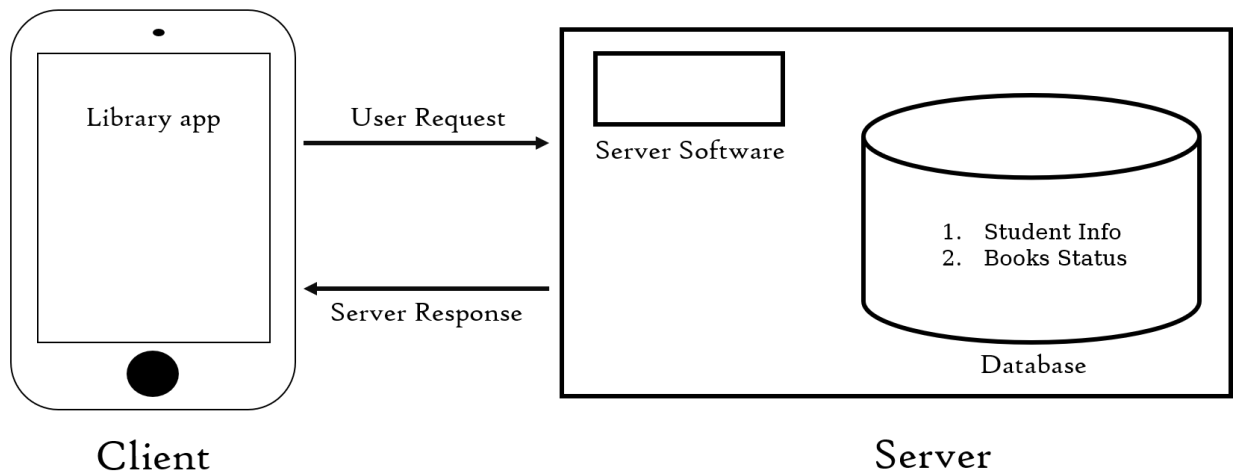Tables (Book, User, Notification) – Tables for Information Storage.

User case diagram for admin

```
                          ┌─────────────┐
                          │   Admin     │
                          └──────┬──────┘
                                 │
                          ┌──────▼──────┐
                          │   Login     │
                          └──────┬──────┘
                                 │
   ┌──────────────┬──────────────┼──────────────┬──────────────┐
   ▼              ▼              ▼              ▼              ▼
┌──────────┐ ┌──────────┐ ┌──────────┐ ┌──────────┐ ┌──────────┐
│ Subject  │ │   Info   │ │   Info   │ │ Setting  │ │  Logout  │
│ select   │ │ Students │ │  Book    │ │          │ │          │
│ Section  │ │          │ │          │ │          │ │          │
└────┬─────┘ └──────────┘ └──────────┘ └──────────┘ └──────────┘
     │
     │   ┌──────────┐
     ├──▶│ Add book │
     │   └──────────┘
     │   ┌──────────┐
     ├──▶│update book│
     │   └──────────┘
     │   ┌──────────┐
     └──▶│delete book│
         └──────────┘
```

After entering to the home page of the website , Admin can choose the Admin Login option where they are asked to enter username & password , and if he/she is a valid user then a teacher login page will be displayed.
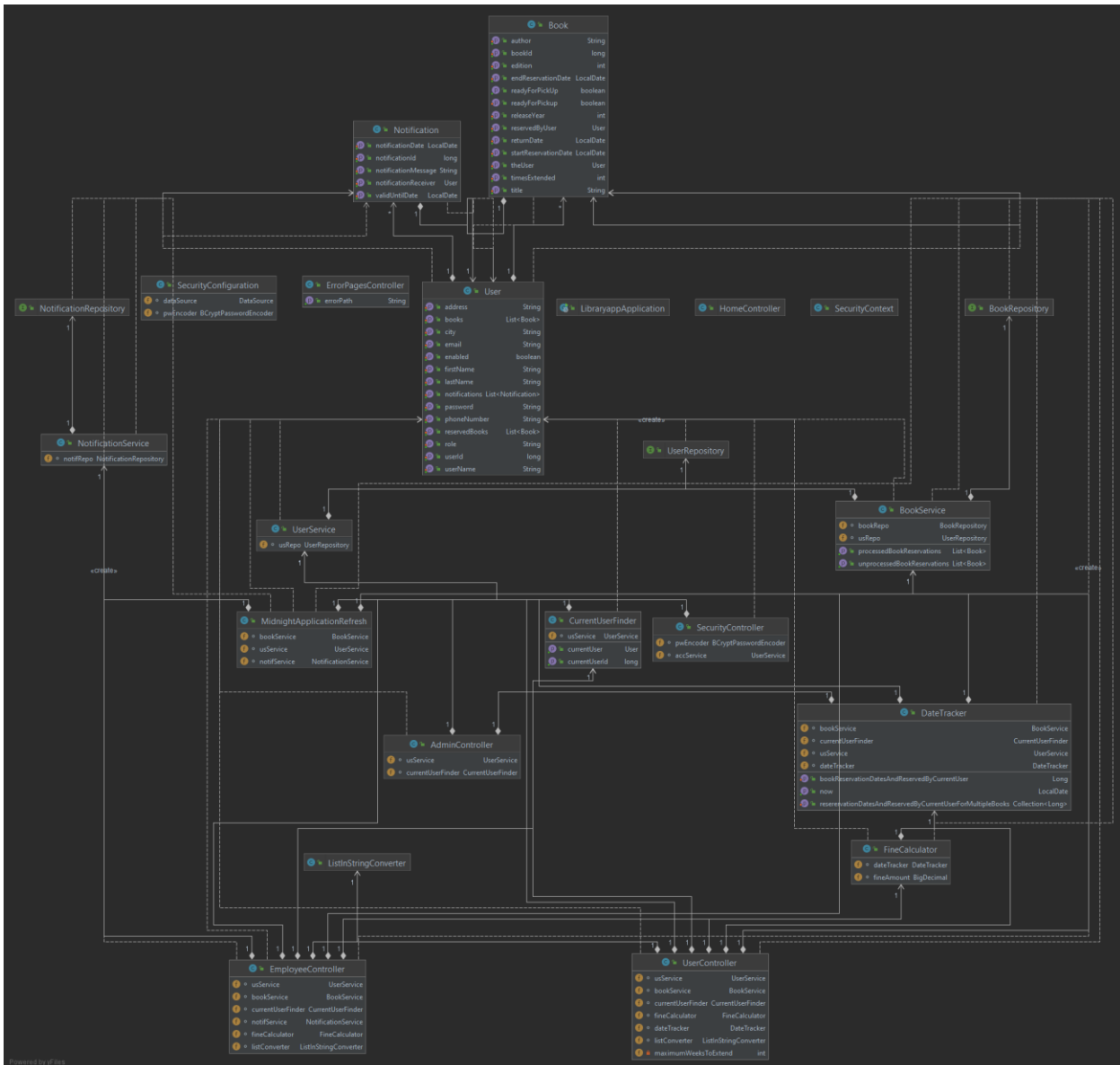
Sequence Diagram

Library management system architecture


```
Library app          User Request          Server Software

                     Server Response                    1.  Student Info
                                                         2.  Books Status

                                                            Database

   Client                                       Server
```

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After entering to the home page of the website , student can choose the USER LOGIN option where they are asked to enter username & password , and if he/she is a valid user then a student login page will be displayed.

Data Flow Diagram for User

Conclusion & Future Scope

This website provides a computerized version of library management system which will benefit the students as well as the staff of the library. It makes entire process online where student can search books, staff can generate reports and do book transactions. It also has a facility for student login where student can login and can see status of books issued as well request for book or give some suggestions. There is a future scope of this facility that many more features such as online lectures video tutorials can be added by teachers as well as online assignments submission facility , a feature Of group chat where students can discuss various issues of engineering can be added to this project thus making it more interactive more user friendly and project which fulfills each users need in the best way possible.