

Title of the Project: Library System and Locator

Group Number: 06

Group Members:

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Introduction

The purpose of a Library System and Locator is to build a software to handle the primary housekeeping functions of libraries and locate a specific book from libraries nearby. The whole system relies on library management systems to manage asset collections as well as relationships with their members. Library management system helps libraries to keep track of the books and their checkouts, as well as members' subscriptions and profiles.

Library management systems also involve maintaining the database for entering new books and recording books that have been borrowed with their respective due dates.

On the other hand, this system will provide the user the easiest and quickest access to their desired books from the nearest libraries and portable libraries as well, without any hassle.

Motivation

Libraries are important cornerstones of a healthy community. Libraries are essential in the process of giving citizen the access of knowledge. In this modern time of digitalization and computerization the old way of going to several libraries in search of a single book is time consuming and inefficient. Our Goal is to solve this problem by developing a system which enables a reader to find his/her desired book in the quickest time from the nearest library.

System Description

Project Sponsor:

Sumaiya Tasmeem, CEO of Marketing

Business Need:

This project has been initiated to improve access to all kinds of books from the nearest library easily by tracking the location of that book using our website.

Business Requirements:

Using the website, users will be able to search for the books in their nearest library and they will also get notification about the portable library whenever it will be in their nearest area. The specific functionality that the system should have includes the following:

- Register user account and update user information
- Allow users to search for books in the nearest libraries
- Allow users to search for library locations
- Provide information of searched books and libraries
- Identify the library that have the specific book in stock

- Show users all available books
- Allow users to rent the books from the library
- Allow users to renew the rented books
- Send reminder of the due date to the users
- Send notifications about fine for not returning the book
- Detect the current location of portable libraries
- Send notifications about the portable libraries to the users
- Allow users to give feedback and review of the books

Business Value:

We expect that users will be able to access to the libraries easily for our location tracking system through the Internet. Also, the system should benefit from the user's satisfaction.

Intangible value to the system includes the following:

- Users will be able to search books easily from any library which will save their time.
- Users will be able to visit nearest library to get the specific book without any hassle.
- Portable libraries and other libraries will get more visitors because of our system.

Special Issues or Constraints:

- The system needs to locate all the portable libraries.
- The system needs to keep records of all the books from the libraries.
- The team needs to communicate with all the libraries to get the detailed information of the books.

Requirement analysis

Functional Requirements:

1. **Sign up:** For any kind of service readers are required to sign up.
2. **Login:** Readers will login using necessary credentials.
3. **View books:** Readers will be able to view books along with writers and publications name.
4. **Registration for books:** Readers will register for books by filling up a form.
5. **Renew:** Readers will able to renew their registered books.
6. **Search:** Readers can search books as well as the locations of different libraries.
7. **Locator:** System will be able to locate portable libraries in 500 meters radius.

8. **Add/remove items:** System can add or remove books based on their availability.
9. **Review:** Readers can give review of the books.

Non-functional Requirements:

1. Operational:

- The system will be able to run on android, ios and web.
- The UI will be simple, image based and user friendly.

2. Performance

- Any interaction between the system and user must not exceed 2 seconds time period.
- User will be able to rent a book within 5 clicks.
- The system will be available 24hours a day, 365 days a year.
- The system will support 500 users simultaneously.

3. Security

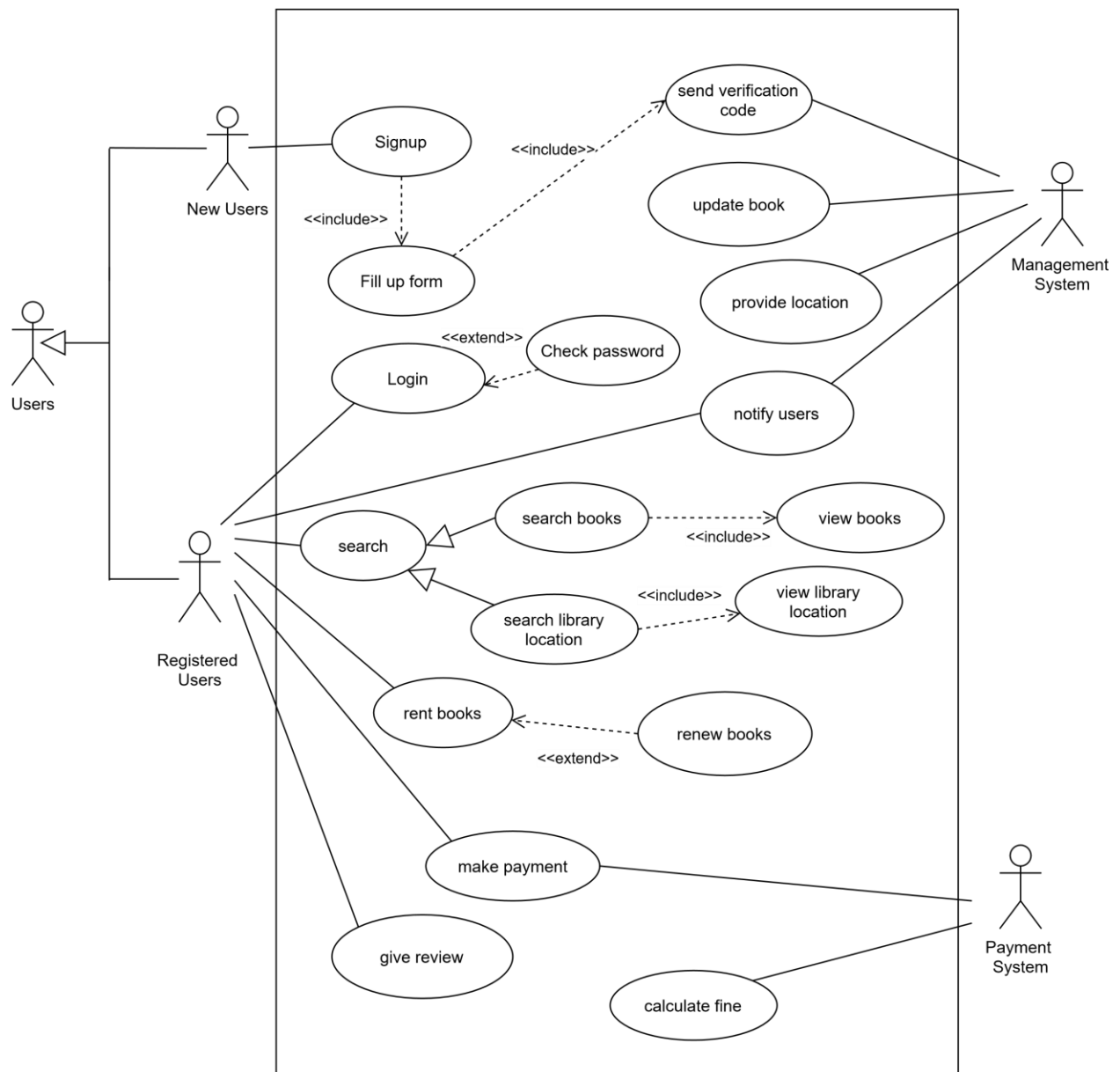
- User will have the authority to change the visibility of their activities within the app from public to private.
- The information taken from the users will only be used for the betterment of the system. No data will be sold to anybody or any organization.

4. Cultural and Political

- The user data and information will be protected in compliance with the Data Protection Act.

Design diagram

Use case diagram



Use Case Diagram Description:

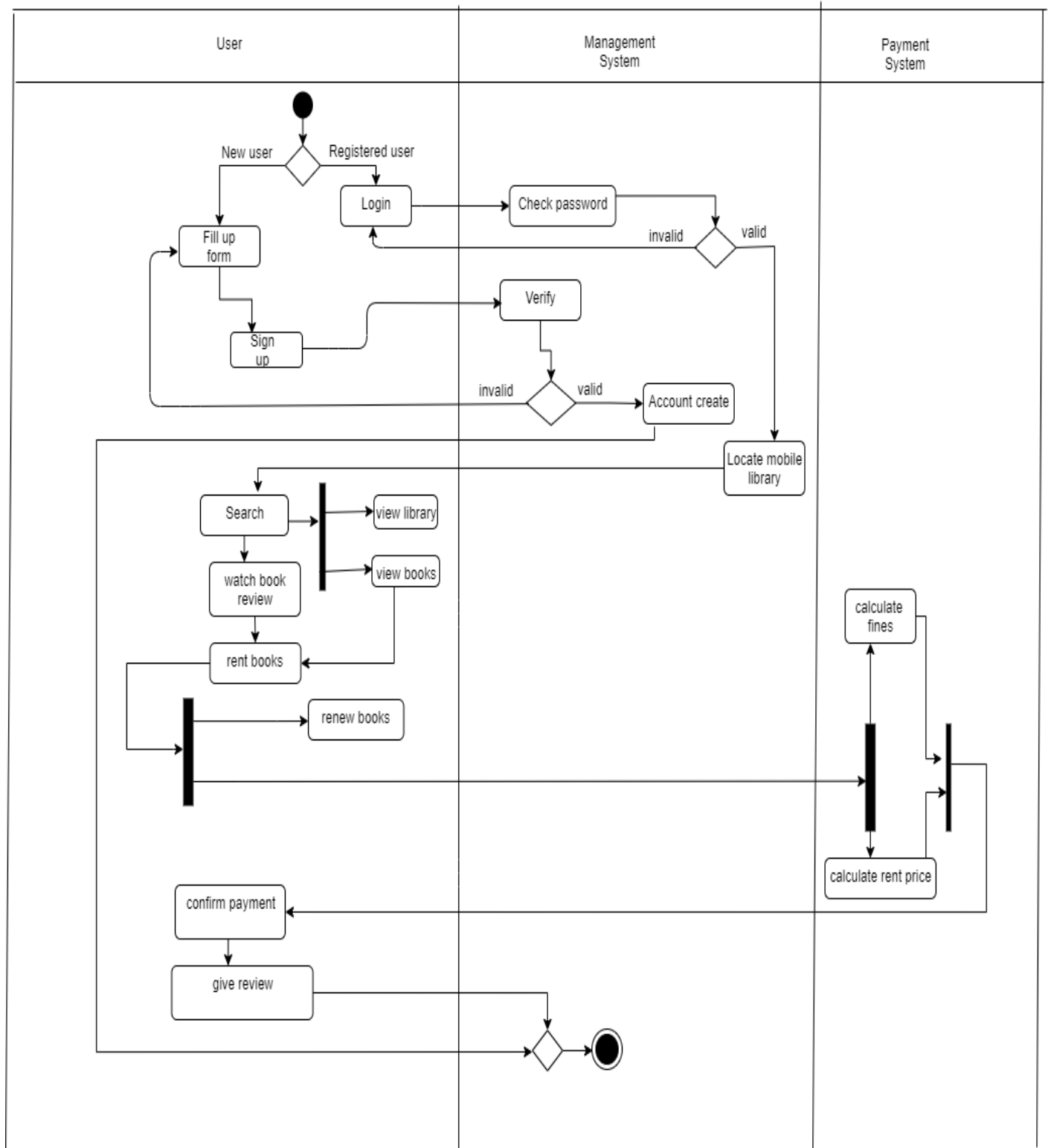
In this diagram we have three major actors which are users, management system and payment system.

To interact with this system for the first time the new user must fill a sign up form by giving required information. After getting verification code from the system, the users will be able to log in the system. For each login user have to give password. If the password is correct then the users will be able to login otherwise users will have to give correct password. After logging in successfully user will be able to search different books by using key words. Users can also search library locations to find out the nearest library. As a result the users will be able to view books and library locations. Users can identify the nearest library locations by searching the library location and can see which books are available in those libraries. Users can also rent books from the library. Users will be able to see the available books in order to rent their desired books. Users will get notification from the system about the due date reminder of the rented books. Users can also renew the books from the library. If the due date is passed, user will have to pay fine for the rented book. User will get fine details from the payment system and they will have to make payment through the payment system. Users can also give review of the books. User can also get notification about the portable libraries whenever they visit the nearest area. User will be notified about the portable library's location instantly by the management system.

The management system will verify new users when they register for the first time. The system will send verification code to the new users by which new users will be able to register successfully. The system will update the books on a daily basis. The system will keep record of all the books and library locations. Whenever a book is rented from the library, the system will modify the records. Also, the system will show users the available books from the library by checking the records. The system will send notification about due date reminder of the rented books to the users. The system will also send notification about fine details to the users if the users fail to return books within due date. The system will provide library location to the users. It will provide information about book details and libraries to the users. The system will also provide the location of portable or mobile libraries to the users. It will send notification to the users whenever the portable library will visit their nearest area.

The payment system will allow users to pay charges and fines for the rented books. The payment system will calculate fine when the due date of the rented book is over and will send the fine details of the book to the users. After the payment, user receives confirmation of payment from the payment system. In this diagram the users are the primary actor, the management system and payment system are the secondary actor. In addition, signup, login, send verification code, check password, view books, search, rent books, renew books, update books, give review, notify users, provide location and make payment are the use cases.

Activity Diagram



Activity diagram Description:

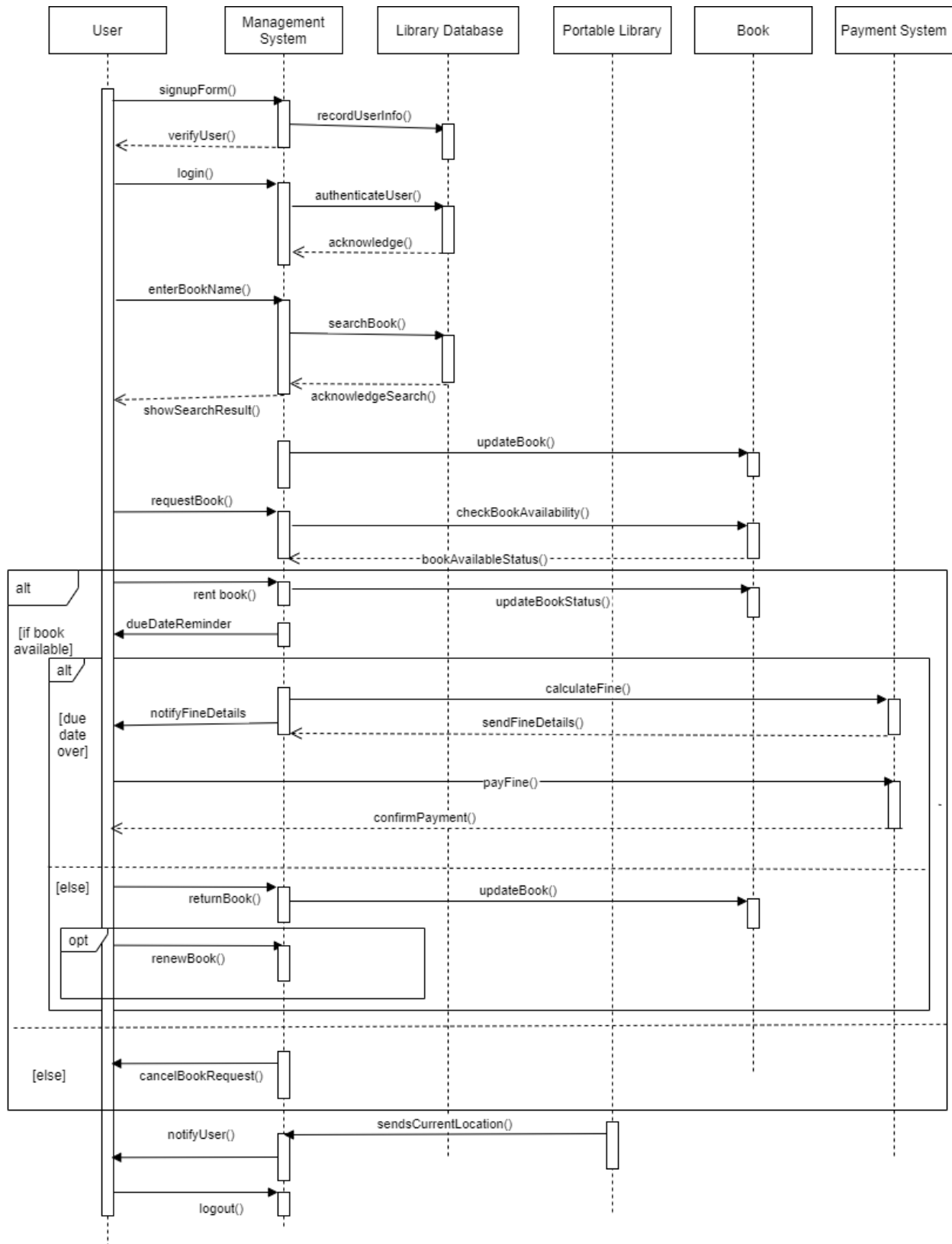
In this diagram we have objects of users, management system and payment system. The initial node is started by the user. To interact with this system for the first time, the new user respectively fills a sign up form by giving required information. Then the management system will verify the user. If the form is invalid, user has to fill up the form again. The system will create an account for valid forms. Registered users login the system then.

For each login user have to give password then the management system will check the password. If the password is correct then the system will allow to login otherwise the system will ask for correct password from the user. After logging in successfully, user will be able to locate libraries and search for the different books and libraries using keywords. Users can view books and libraries with details by searching. User can also rent books after watching the book review. Users will pay for the books through the payment system. They can also renew books after renting books.

The management system will provide the location of portable or mobile libraries to the users. It will show users different books and libraries when they will search the books or libraries by using keywords.

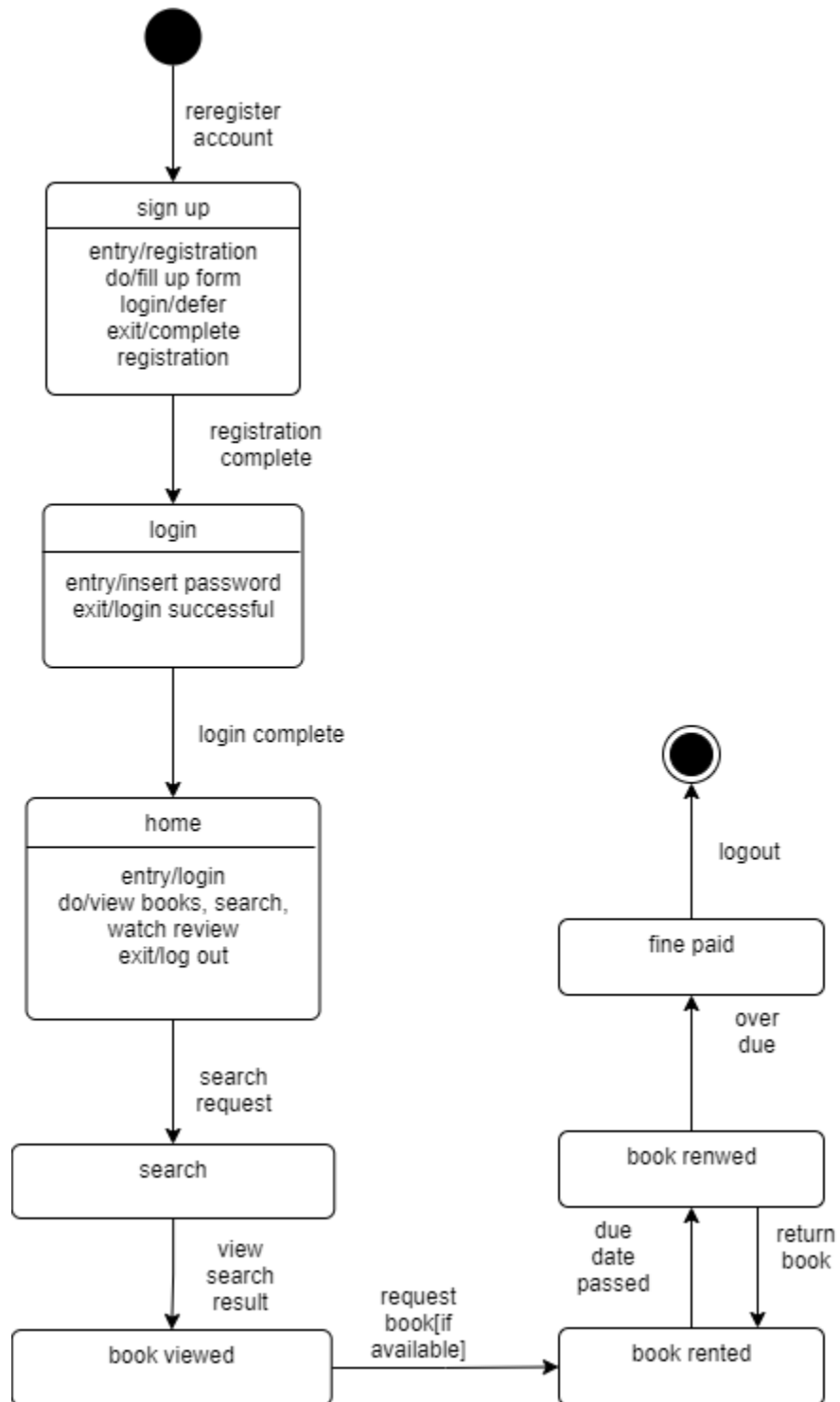
And the payment system will allow users to pay charges and fines for the rented books. After the payment, user receives confirmation of payment from the payment system. After confirmation, the user can give book review. And this results in an ending node.

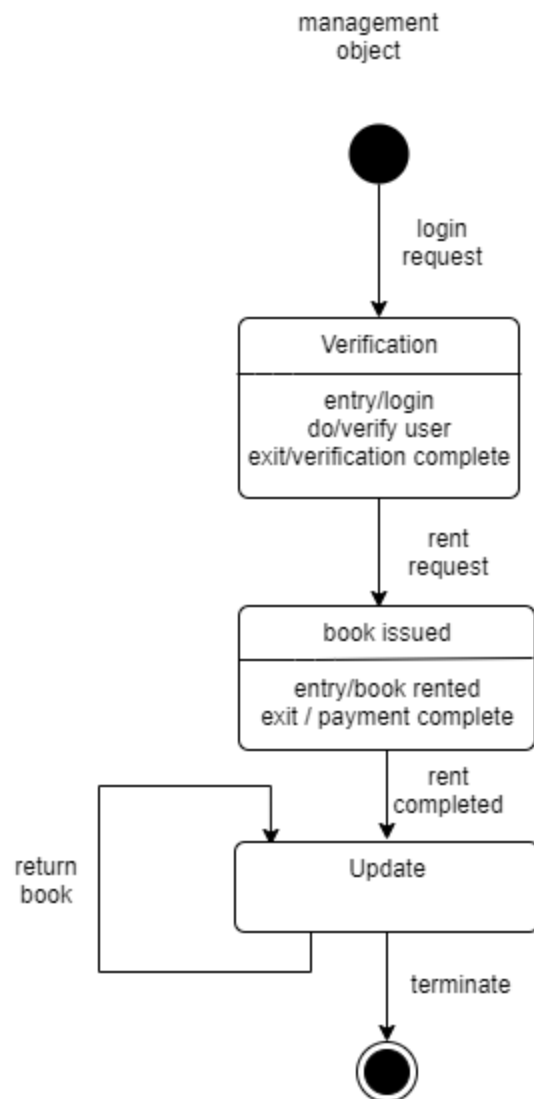
Sequence Diagram



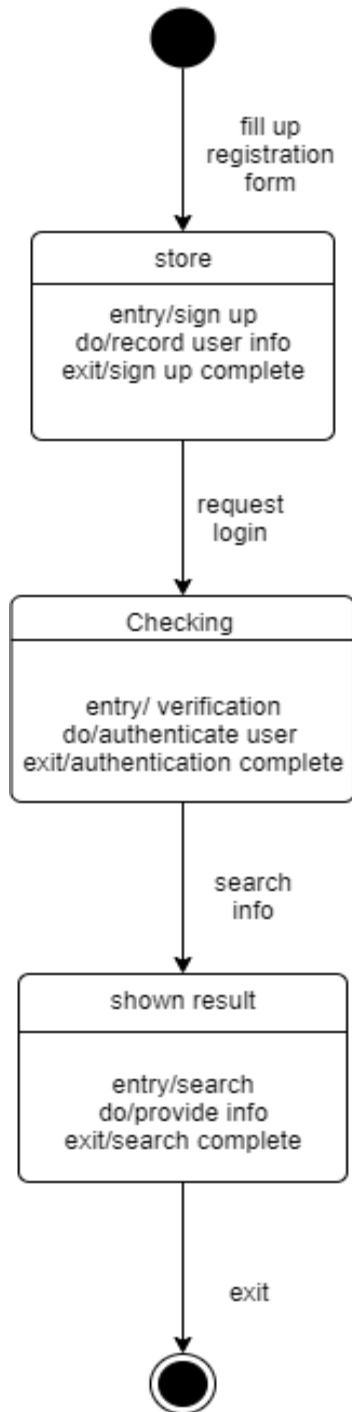
Sequence diagram description: The registered users can directly login into the system by inserting email and password. And the new users will have to sign up for first time. The information of the users will be saved in the library database. The management system will verify and authenticate the users. After logging in successfully the users will search suitable books in the library database. Then the management system will show the search result to the users. The user can rent books for a certain period of time if the book is available in the library. The management system can also update books in the database. If the due date of the rented book is passed the payment system will calculate the fine and send fine details to the users. Then the user will make payment in the payment system. In this system the users can also get the location and notification from the portable library.

State Machine Diagram

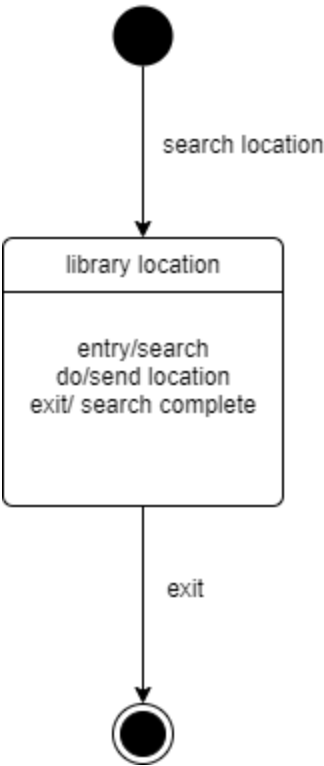




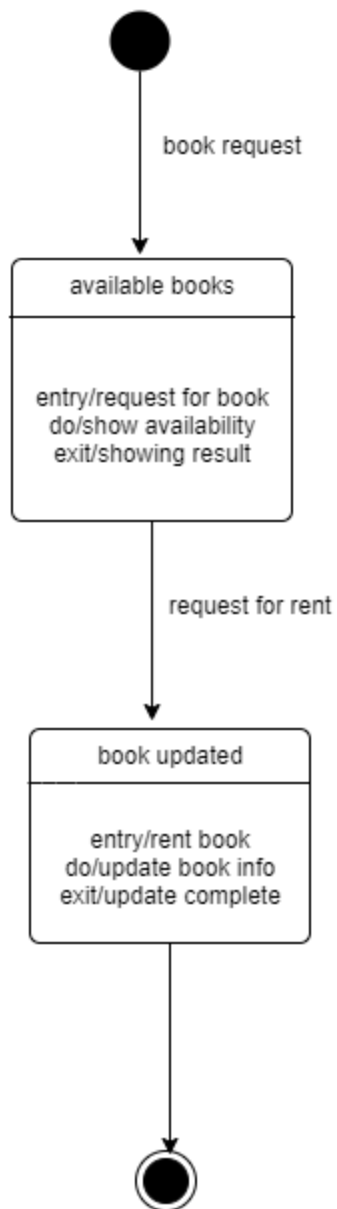
database
object



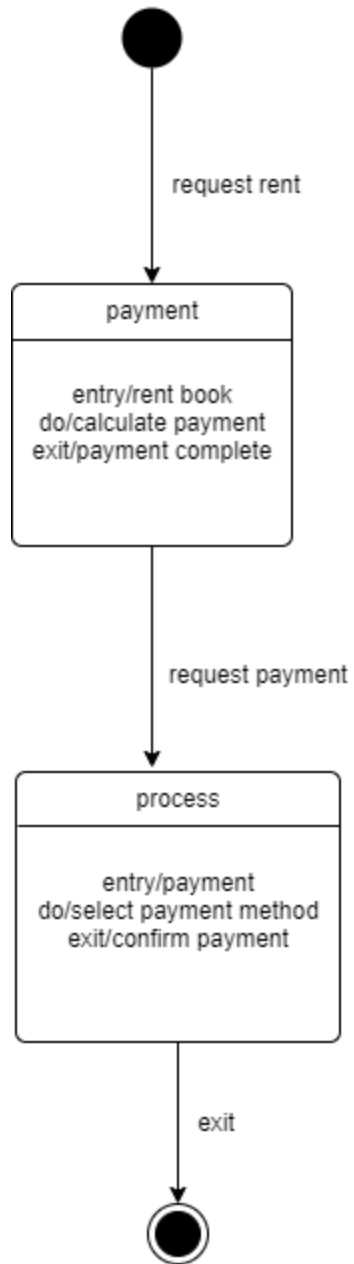
portable library object



book object

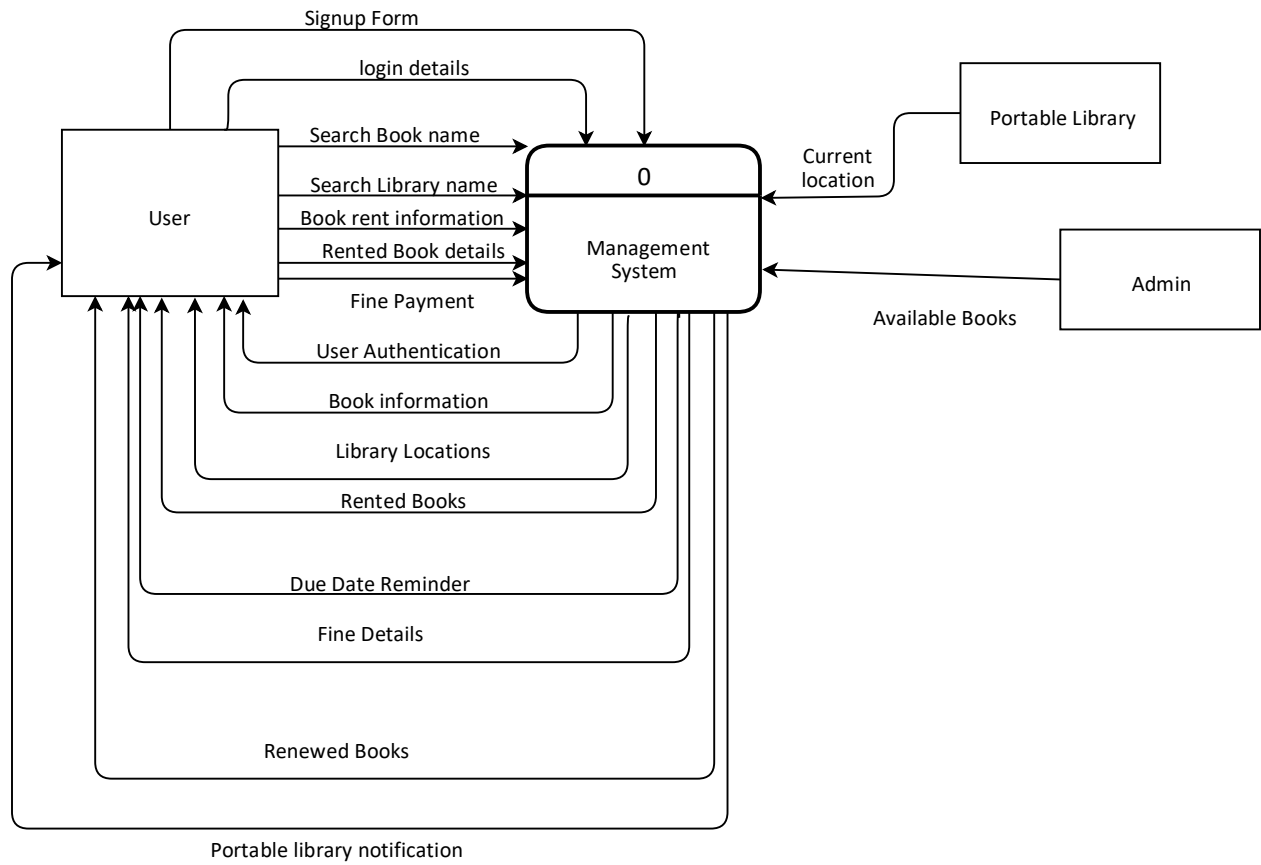


payment object

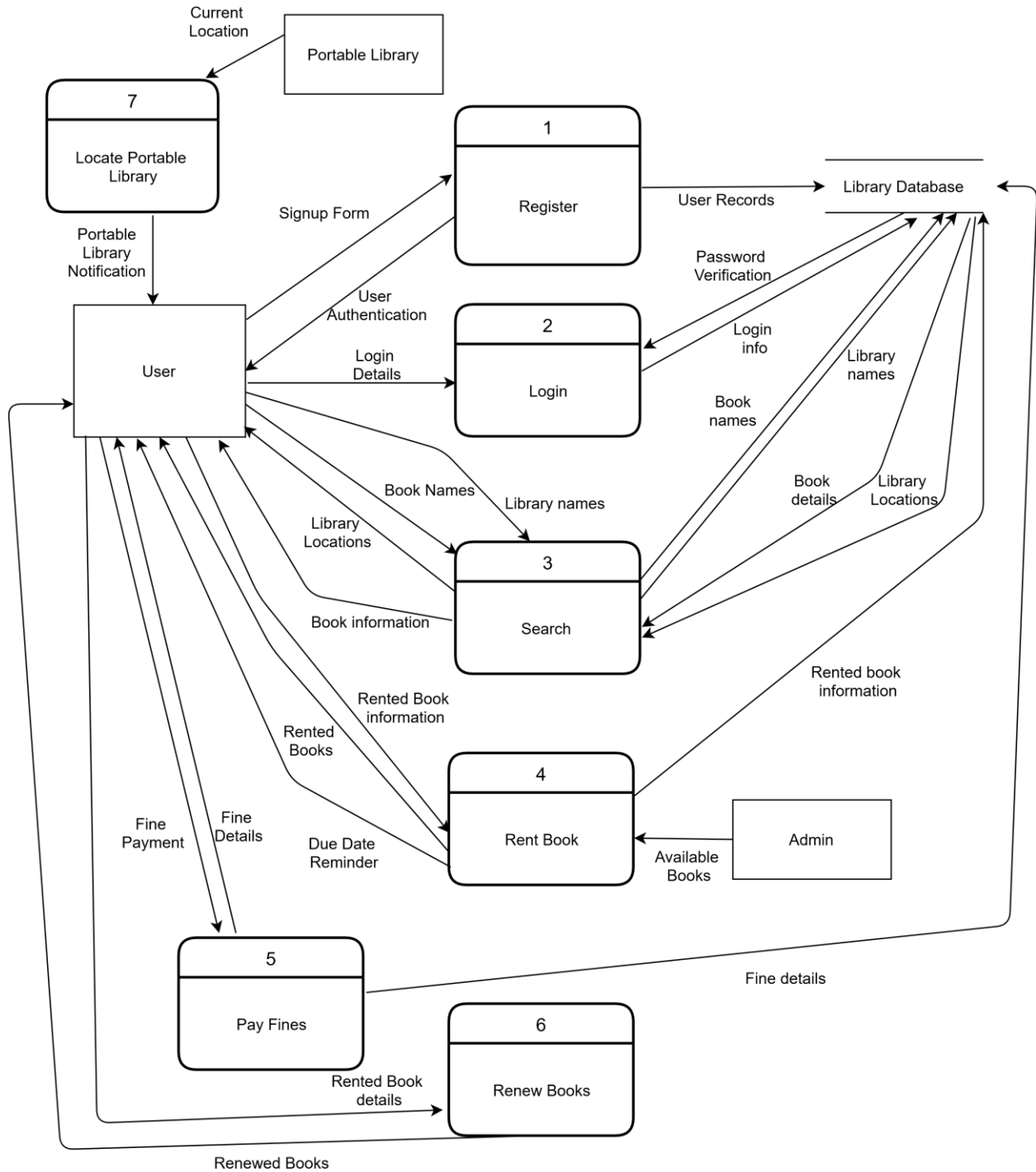


Data Flow Diagram

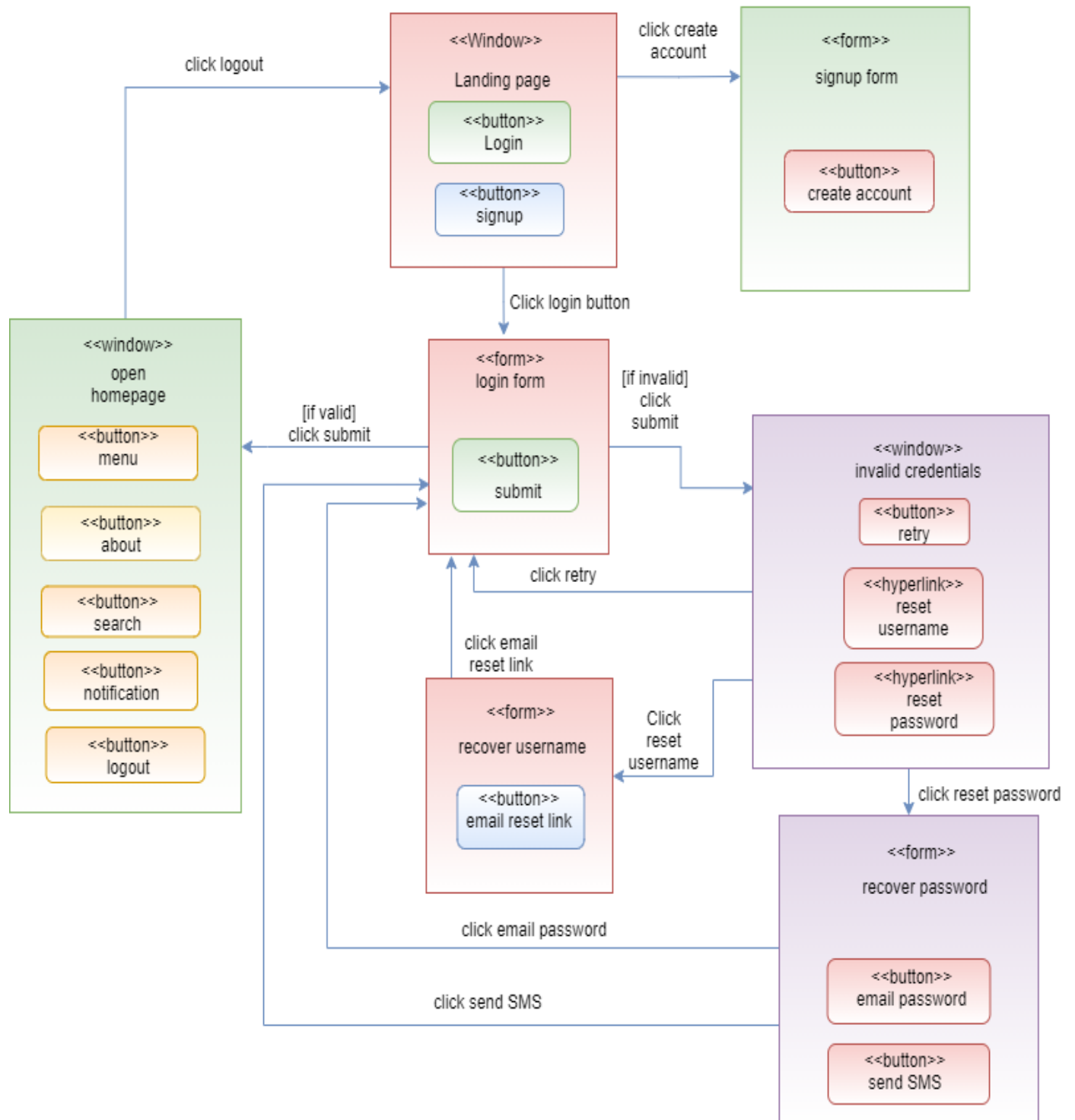
Level 0 DFD:



Level 1 DFD:



Windows Navigation Diagram



Conclusion:

This system provides a computerized version of library management system which will benefit the reader and the library staffs both. It makes the entire process online which includes searching for a specific book from the nearest library, getting information about those books and library locations. It also has a facility for members to login with their account and borrow a book. The process of borrowing and returning books is user-friendly and can be done online. It has a facility to track any portable library nearby. The whole system has the capability to satisfy its members' need by providing a quick and easy access to their desired books from nearest library.