BBM487-Software Engineering Laboratory

Library Book Loan System
Software Design Description

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1. Revision History

Version	*Date*	*Author*	*Change Description*
1.0	24.04.2017	Aishat Temitope OLOMOWEWE	Software Design Description.Initial release.
1.1	25.04.2017	Ali Burak Özakıncı	Software Design Description.Document Release 1.1

2. INTRODUCTION

2.1 Purpose and Scope

The purpose of the Software Design Document is to provide a description of the design of the library book loan system enough to allow for software development to proceed with an understanding of what is to be built and how it is expected to be built. The library book loan system is designed to provide easy and fast way for users to access the library books with a simple and functional user interface.

This Software Design Document is for a base level system which will work as a proof of concept for the use of building a system that provides a base level of functionality to show feasibility for large scale production use. This Software Design is focused on the base level system and critical parts of the system. For this particular Software Design Document, the focus is placed on generation of the documents and modification of the documents. The system will be used in conjunction with other pre-existing systems and will consist largely of a document interaction facade that abstracts document interactions and handling of the document objects.

2.2 Document Overview

- Sections 1 (“Introduction”) explains the purpose and scope of the SDD, and indicates what information is and is not included. This tells you if the information you’re seeking is likely to be in this document.

- Sections 2 (“design constraints and decision”) explains the constrains and decisions of the design process

- Sections 3 (“Design detail”) explain the internal details of each design entity. These details include attribute descriptions for identification, processing and data. It contains all the details that will be needed by the programmers for implementation.

- Sections 4 (“Requirement Traceability”) traceability relationship between requirements and software design to show that all requirements are met

- Sections 5 (“Annexes”) explains the subordinate parts added to this document

2.3 System Overview

The library loan system project is a library management software with user friendly UX and fast transactions and clean monitoring support.The software has ability to manipulate books and users,also gives provides users a smooth experience for borrowing books and getting information about that.

The system is developed in “Python”.PyQT Gui framework used for graphic functions.Qt designer is used to generate Ui codes from visual designs.

2.4 Definitions, Acronyms, and Abbreviations

Term/Acronym	***Definition***
PyQT	Gui framework for python
LBLS	Library Book Loan System
SDD	Software Design Description

3. Design Constraints and Decisions

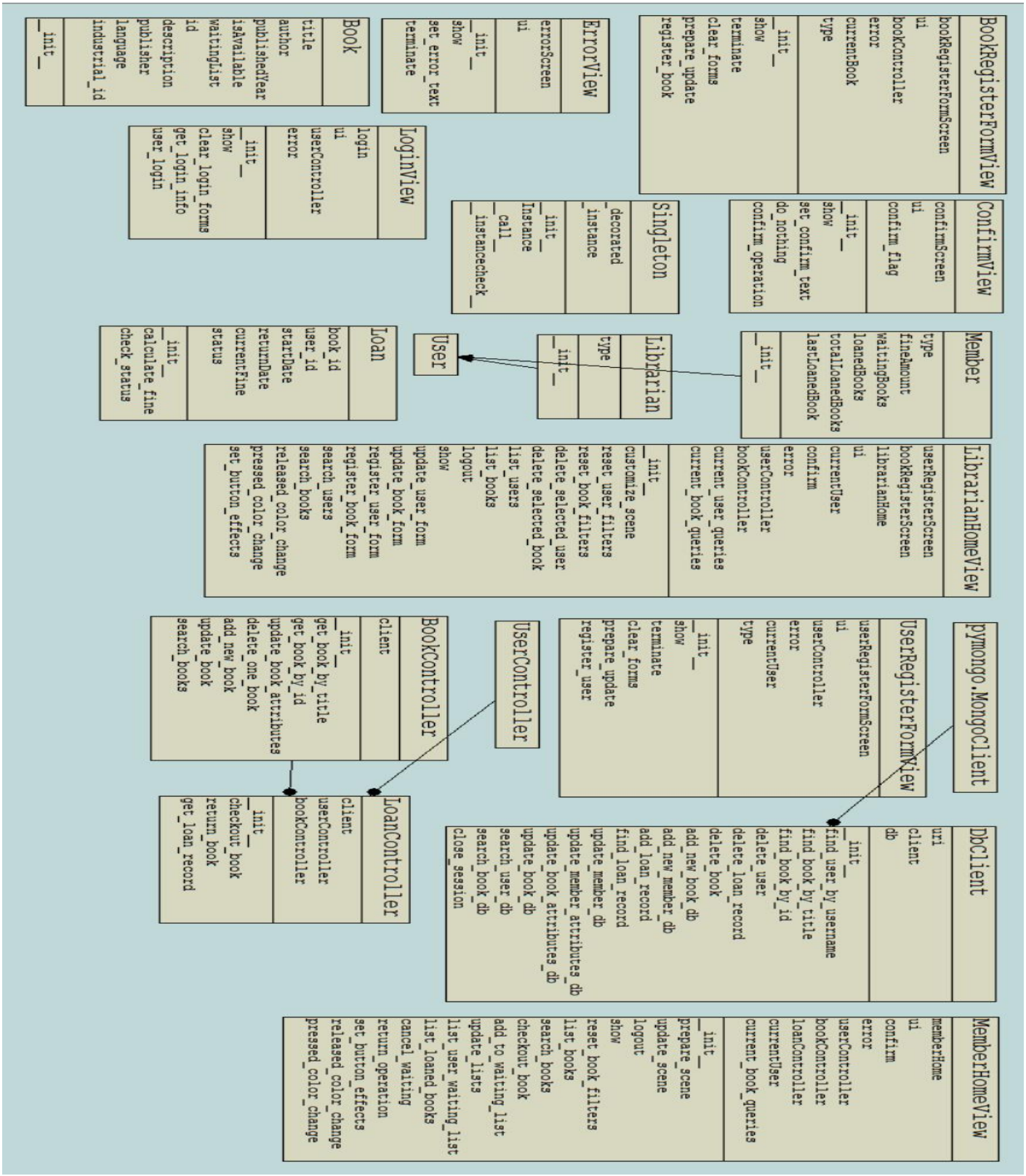
- Python 3.5 will be used to implement the project.
- The Library Book Loan System has 3 main components.System itself, Database Management System and Payment API.
- Software will be operated on Linux and Windows.
- The database management will be based MongoDB.
- It is a desktop application with local MongoDB server as default.But can be used on cloud database like mLab to improve portability.
- PyQt5 will be used to design and implement interfaces
- The connection between database and the system will be established using PyMongo.
- There won’t be a hardware interaface associated with project.

- User and book manipulation operations can only be done by librarian users.

- The software is LGPL licensed. Open-sourced for every types of use.
- The software has several error popups depending on the situation.”Wrong password”,”Empty are on form”,”Checkout attempt on unavailable book”,”Adding an available to waiting list” etc.
- The software responds to all requests at most 2 seconds.This provides responsible and fast experience for users.
- Unregistered users can only search for books and check book info.

4. Design Details

4.1 Software Components



4.2 Software Behavior

Sequence Diagrams:

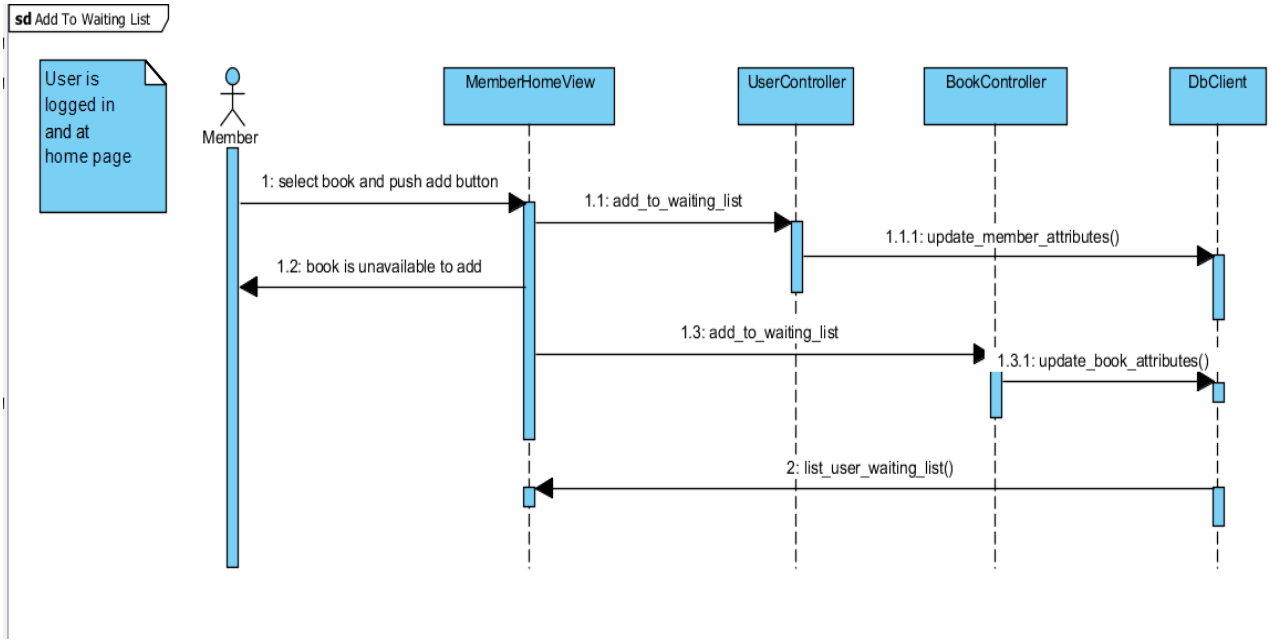


Figure 1: Add to waiting list

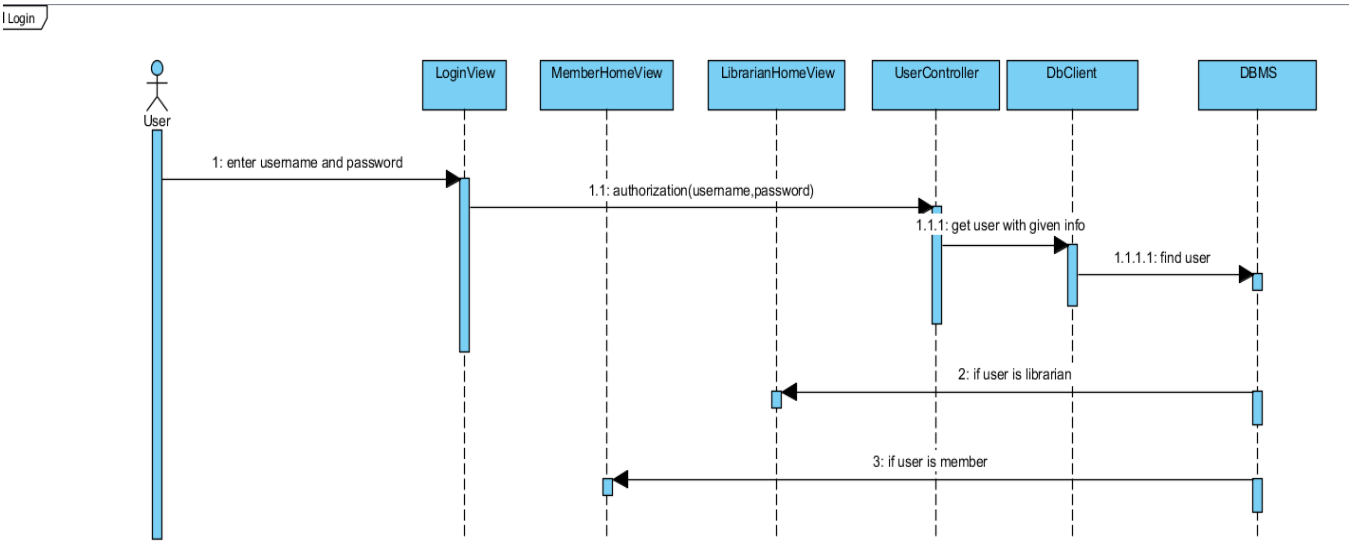


Figure 2: Login

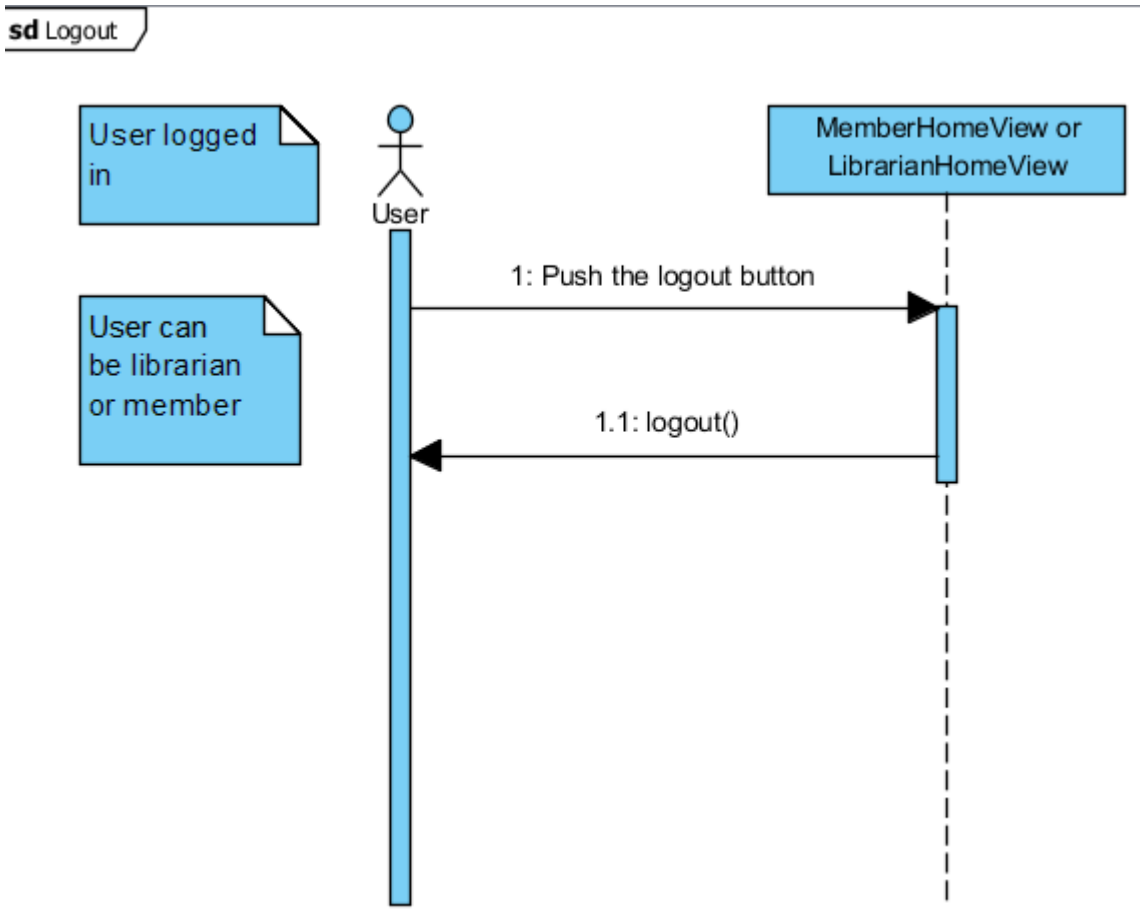


Figure 3: Logout

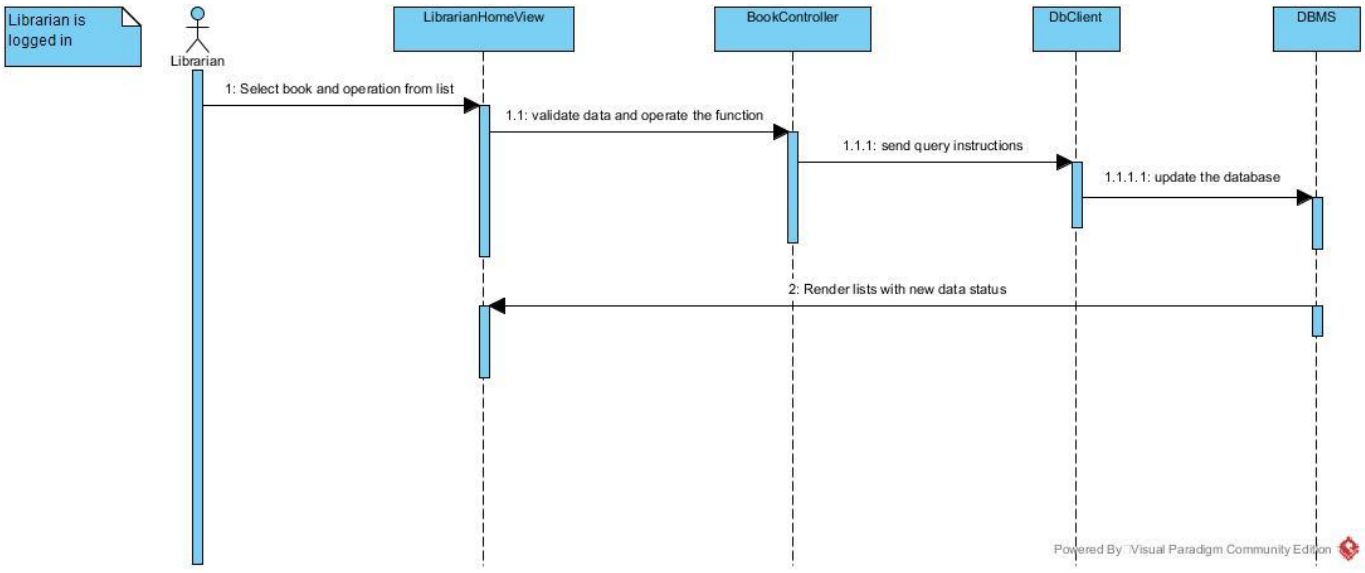


Figure 4:Manipulate Book

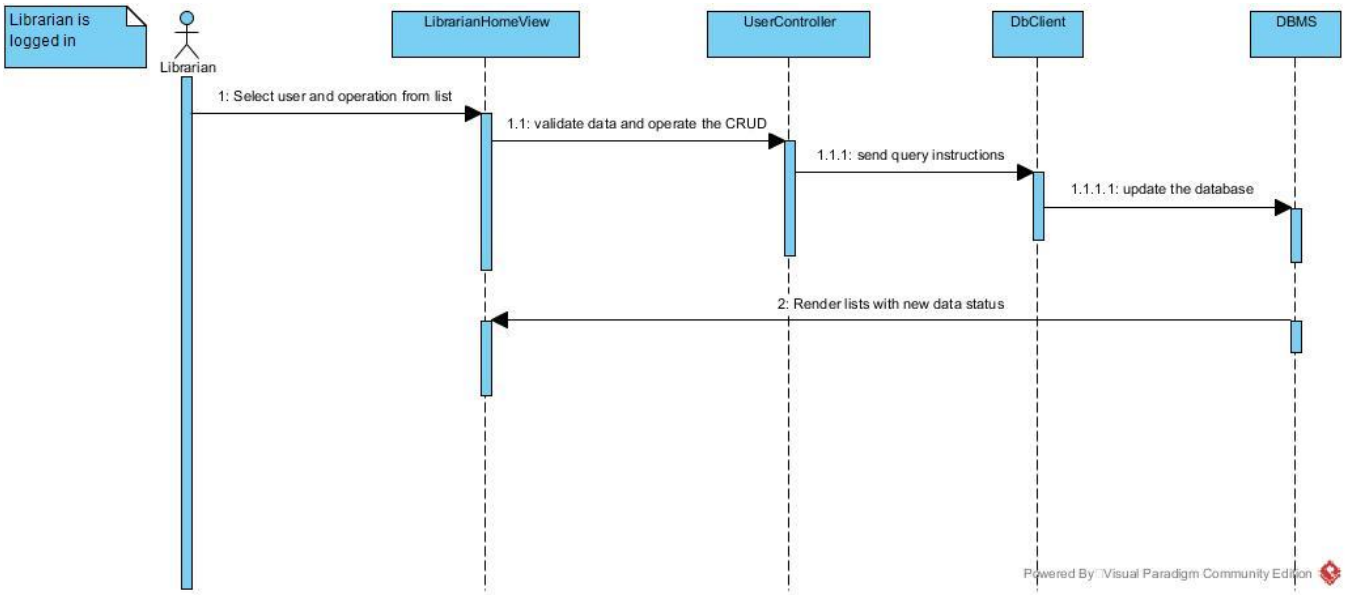


Figure 5:Manipulate Member Users

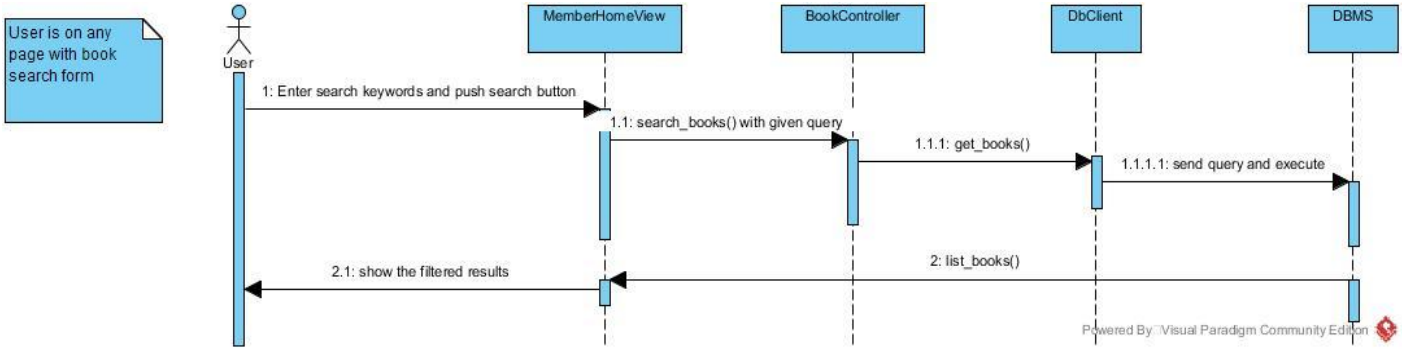


Figure 6:Search For Books

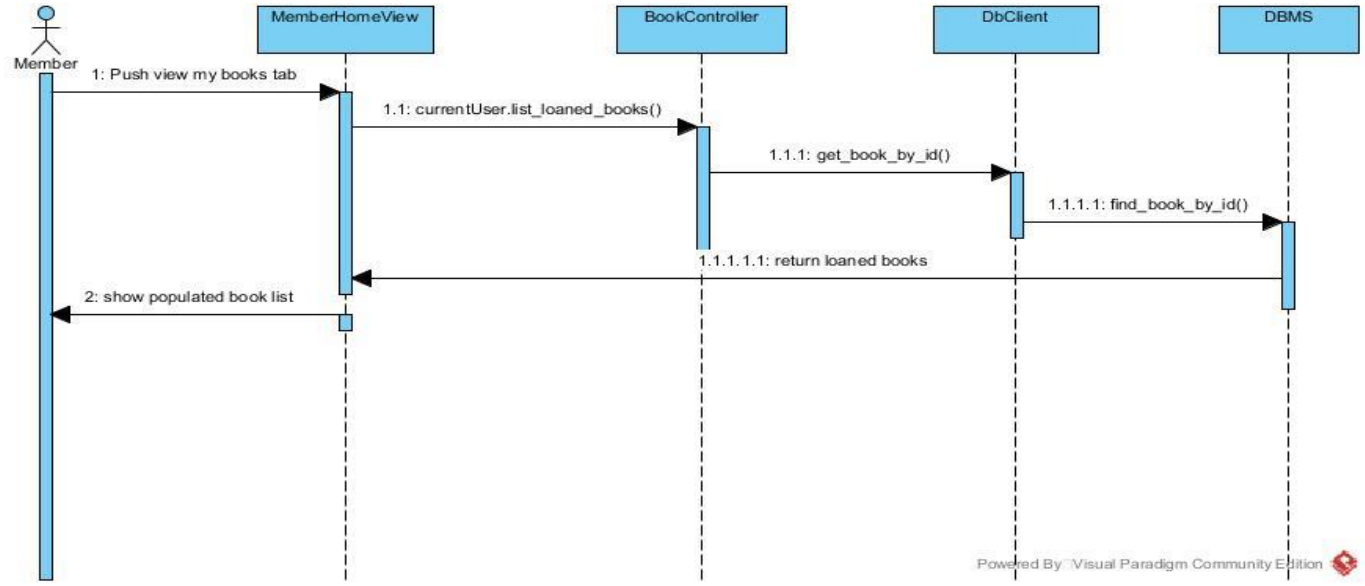


Figure 7:View My Books

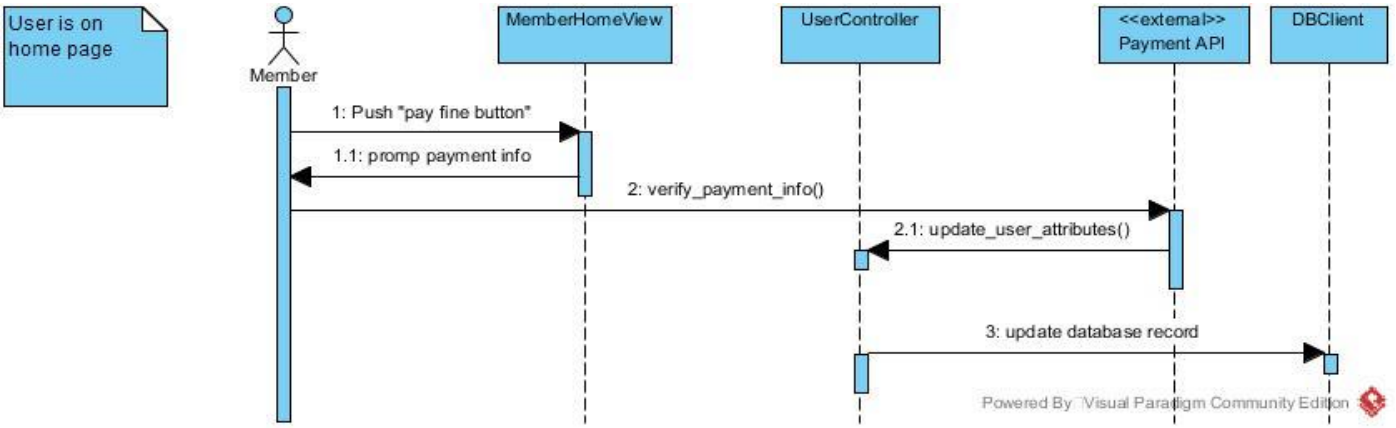
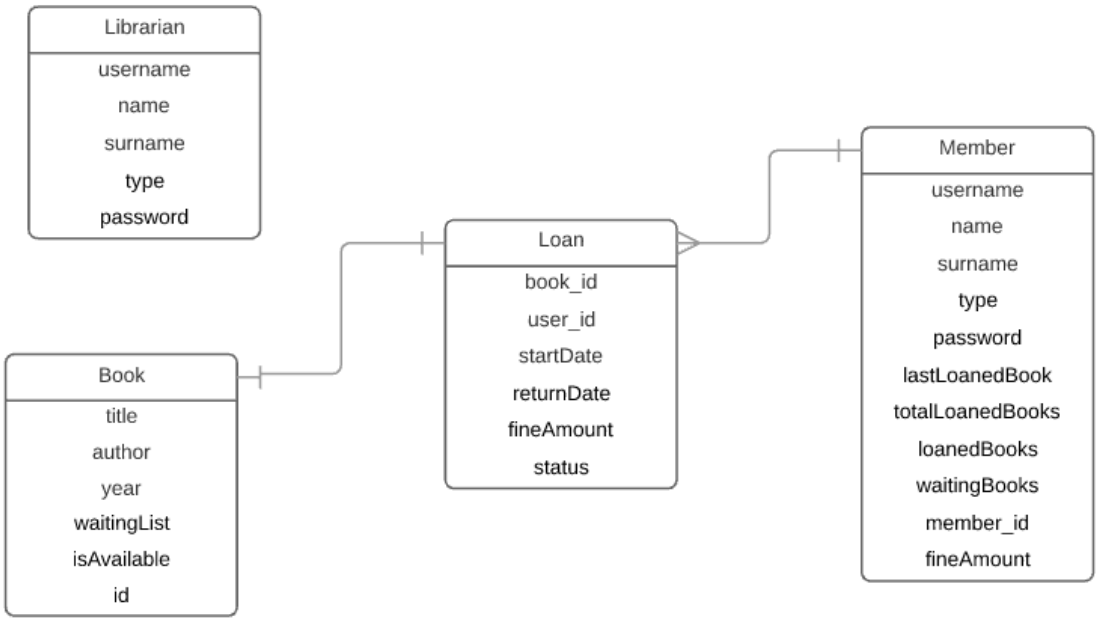


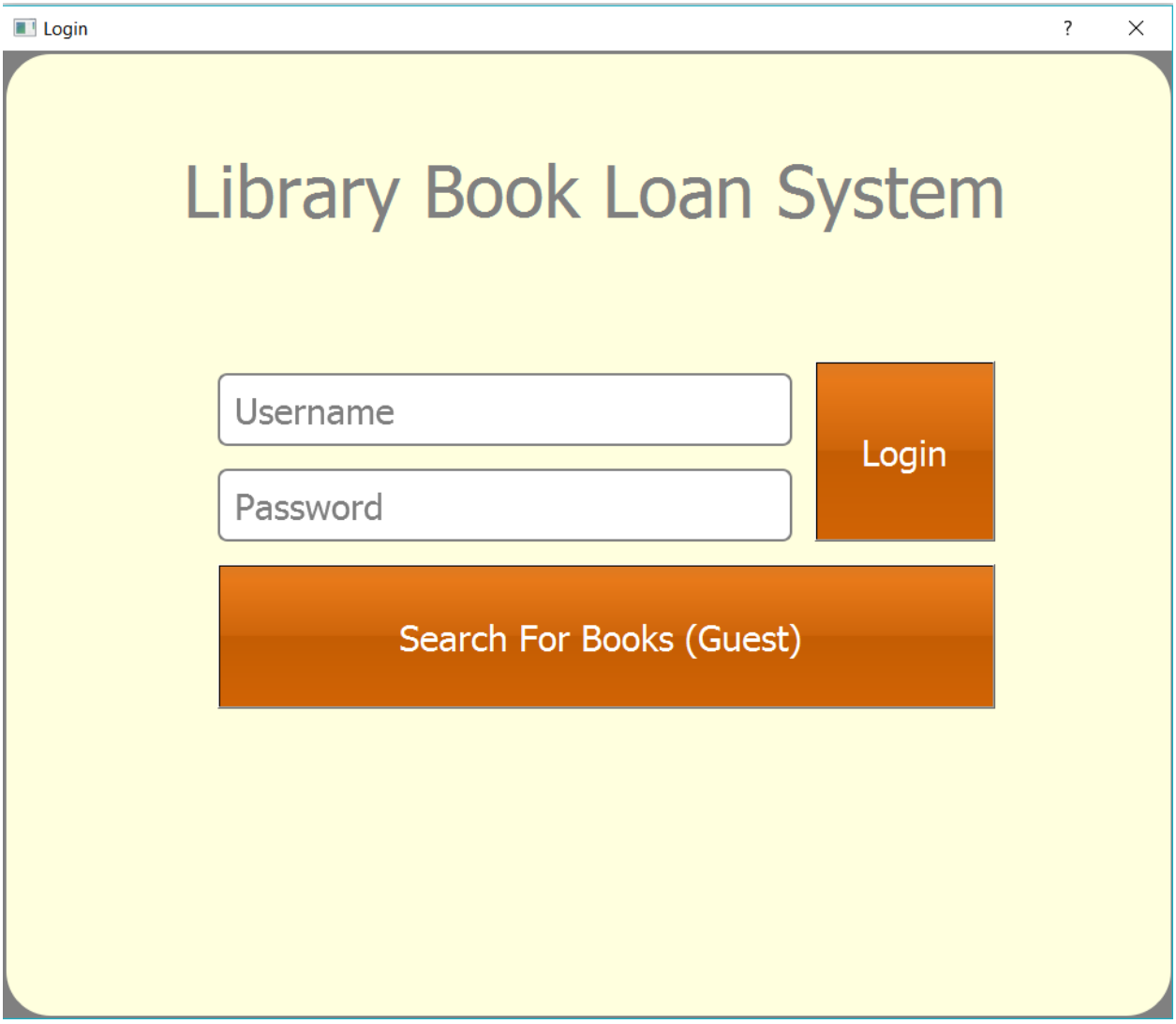
Figure 8:Pay Fine

4.3 Data Model (E-R Diagram)



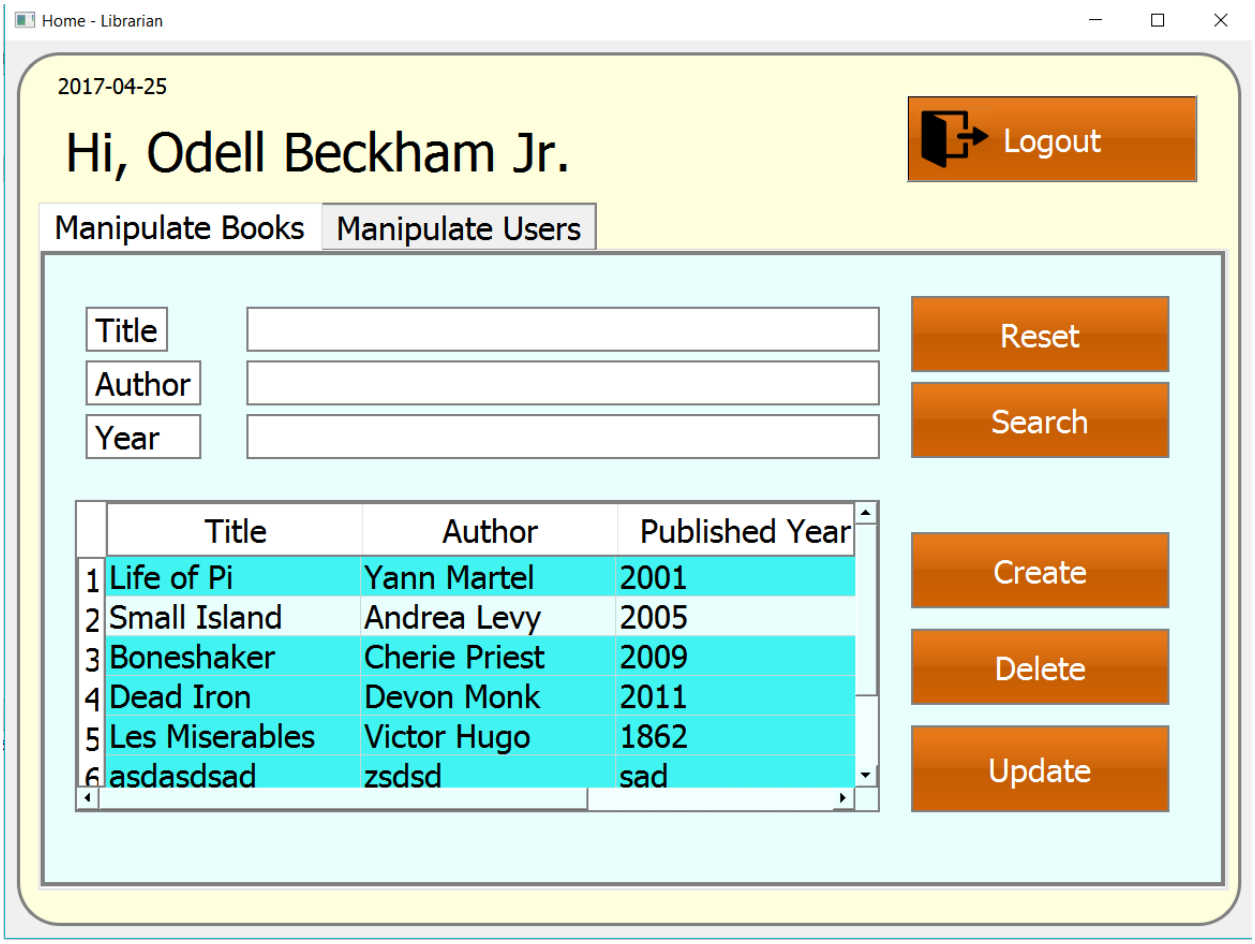
4.4 User Interface Design

LOGIN



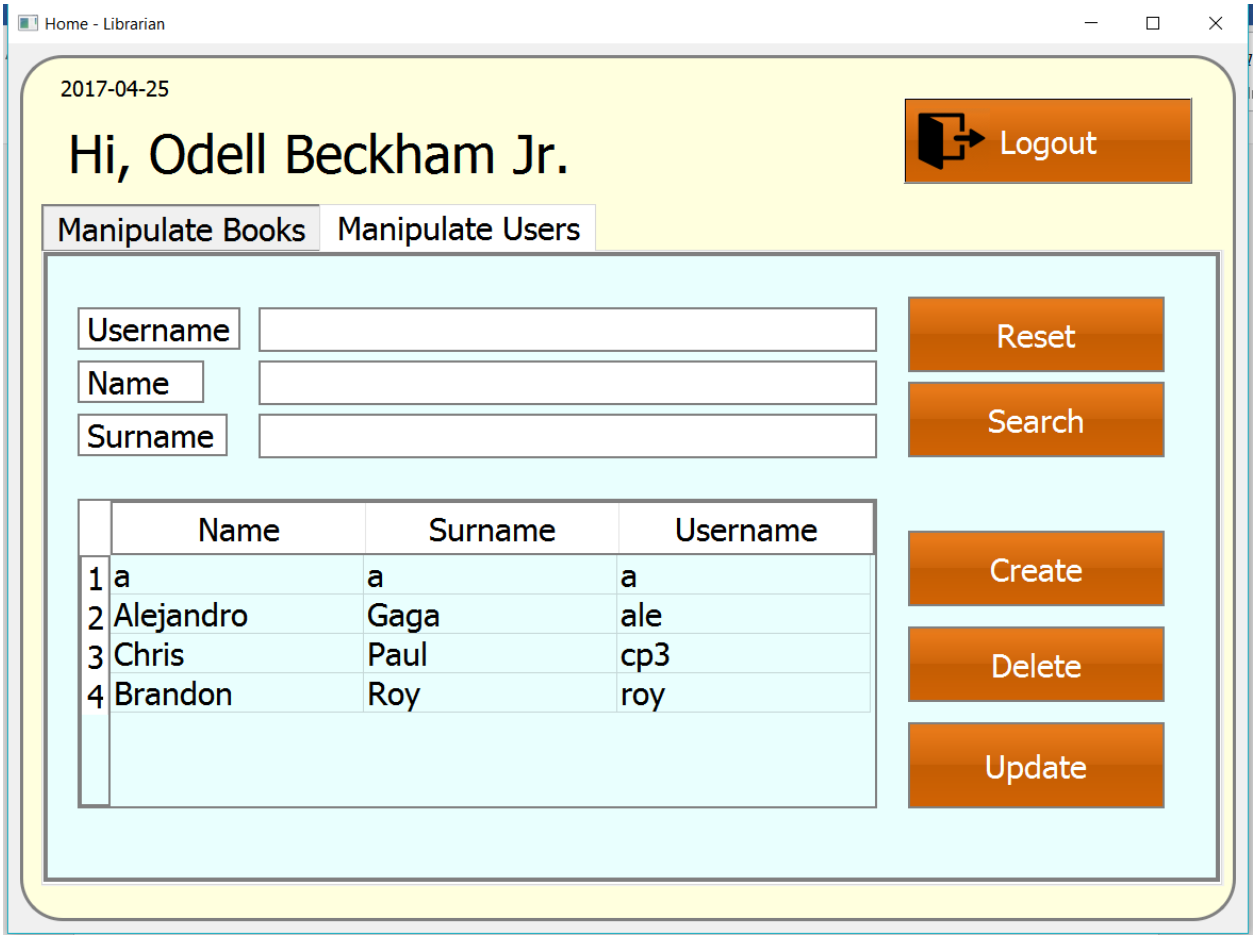
Registered users can login by entering username and password.Gives an wrong credentials error.Also guest users can search books.

LIBRARIAN HOME VIEW – MANIPULATE BOOKS TAB



Librarians can add,delete,search or update books with in tab by selecting from list.Reset button clears the search filters.Dark blue listed items are loaned unavailable books. Double clicking on item triggers update function and show an update form to user.

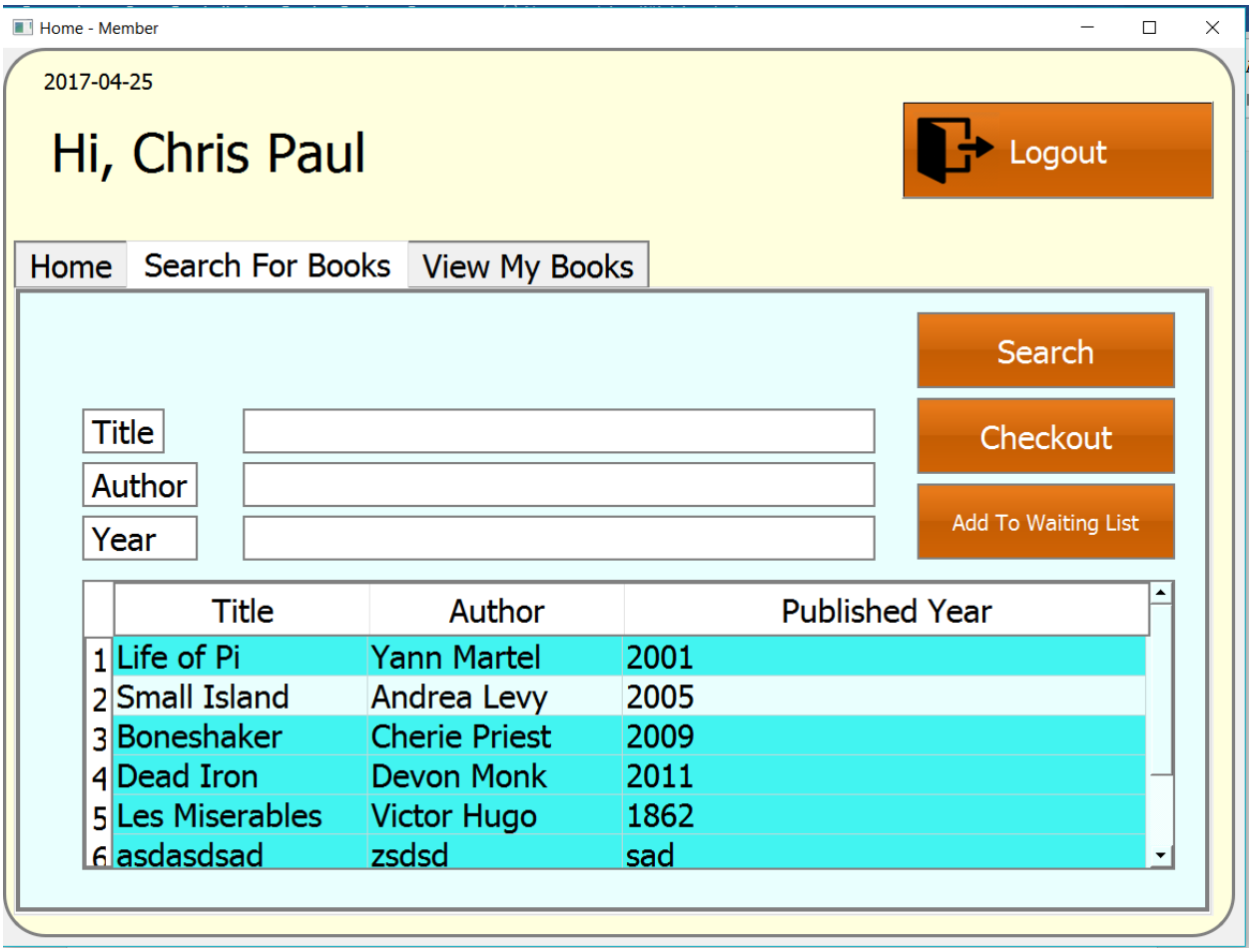
LIBRARIAN HOME VIEW – MANIPULATE USERS TAB



Librarians can add,delete,search or update members in this tab by selecting from list.Reset button clears the search filters.Double clicking on item triggers update function and show an update form to user.

MEMBER HOME VIEW – HOME

Home page for member users.It has stats at right bottom about library usage history.User can see its waiting list and cancel them.Pay fine operation is operated in this interface.It prompts a payment information popup.



User can search books using the filter forms. Dark blue listed items are loaned unavailable books.

5. Requirements Traceability