SAVITRIBAI PHULE PUNE UNIVERSITY

A PRELIMINARY PROJECT REPORT ON

LIBRARY MANAGEMENT SYSTEM

SUBMITTED TOWARDS THE PARTIAL FULFILMENT OF THE REQUIREMENTS OF

BACHELOR OF ENGINEERING
(TE COMPUTER ENGINEERING)

Academic Year: 2019-20

Project Member:

1]Gaurav Borse(TECOC310)

2]Manish Choudhary(TECOC313)

3]Bhavit Dagade(TECOC314)

4]Tanishq Dhussa(TECOC318)

By:

A **Under The Guidance of**
Prof. Santosh Sambhare

DEPARTMENT OF COMPUTER ENGINEERING,

PIMPRI CHINCHWAD COLLEGE OF ENGINEERING

PIMPRI CHINCHWAD COLLEGE OF ENGINEERING

DEPARTMENT OF COMPUTER ENGINEERING

CERTIFICATE

This is to certify that the project entitled

"**LIBRARY MANAGEMENT SYSTEM**"

is successfully carried out as a mini project successfully submitted by following students of "PCET's Pimpri Chinchwad College of Engineering, Nigdi, Pune-44**.**

Under the guidance of Prof. Santosh Sambhare

In partial fulfillment of the requirements for the T.E. (Computer Engineering)

Prof. S. Sambhare
Project Guide

INDEX

10.	C.Sequence Diagram	
11.	D. Communication Diagram	
12.	E. Timing Diagram	
13.	Architectural Styles	
14.	Design Pattern	
15.	Testing	
16.	References	

ABSTRACT

This report is all about the development of the Library Management System. It develops use to convince the member to search the book and also ease the borrowing of books from the library.

This system is mainly used by members and staff. It allows the member to search and reserve books. Members allow search of the book and know what book contains it in the library. Other than that, the member allows us to see the book detail and also comment on the book. Members also reserve the book via system so that they can save their time and cost to travel from their destination to the library. Members also can view the current book they are borrowed and also the history of the book they have borrowed.

The report's chapter was included system planning, requirement analysis, system design, programming, system testing, and evaluation of the project.

INTRODUCTION

The library management system is a project which aims in developing a computerized system to maintain all daily work of the library. This project has many features that are generally not available in normal library management systems like the facility of user login. It also has a facility of admin login through which admin can monitor the whole system.it also has a facility where students after logging in their accounts can see a list of books with no issue date and return date and also the students can request the librarian to add new books into his account. The admin account can generate various reports such as a report, issue report, teacher report, and book report.

Overall this project of ours is being developed to help students as well as the staff of the library to maintain the library in the best possible way and also reduce the human efforts.

PROBLEM DEFINITION

The manual process of keeping student records, book records, account details, managing employees is very difficult. There are various problems also faced by the student in the library such as finding any particular book, information whether the book is available or not, for what time this book will be available, searching for books using ID number, etc. To eliminate this manual system, a library management system has been developed. It will

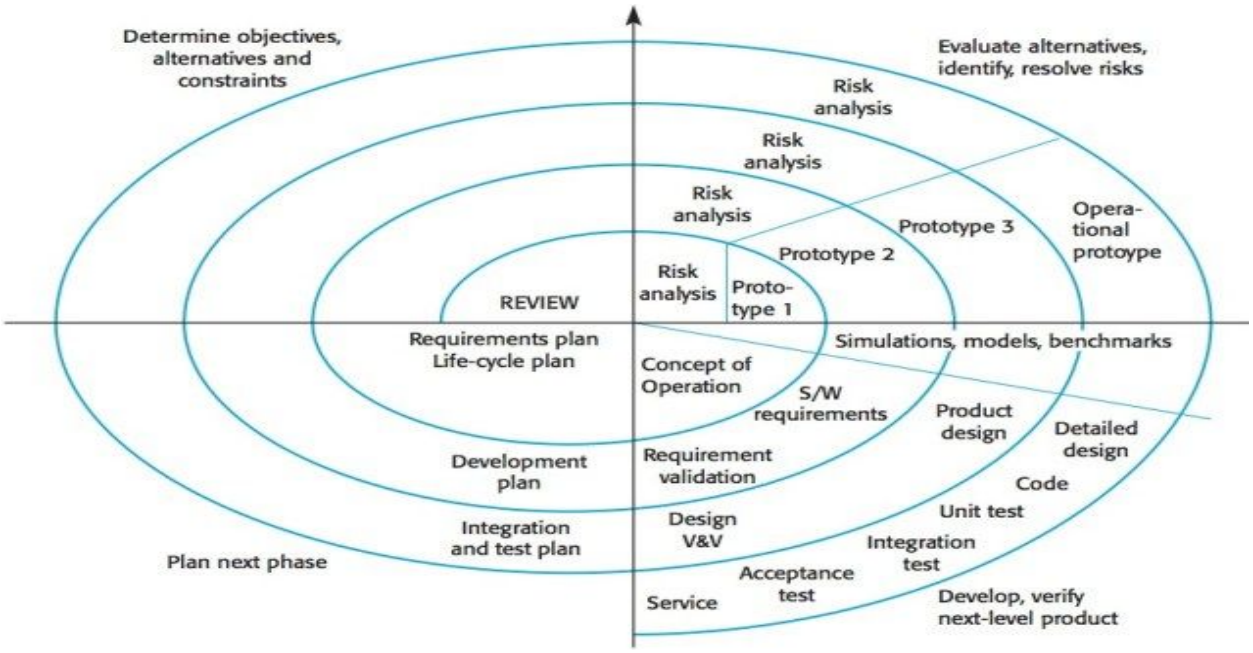
handle all the current issues faced by the students and by its admin personnel.

SCOPE

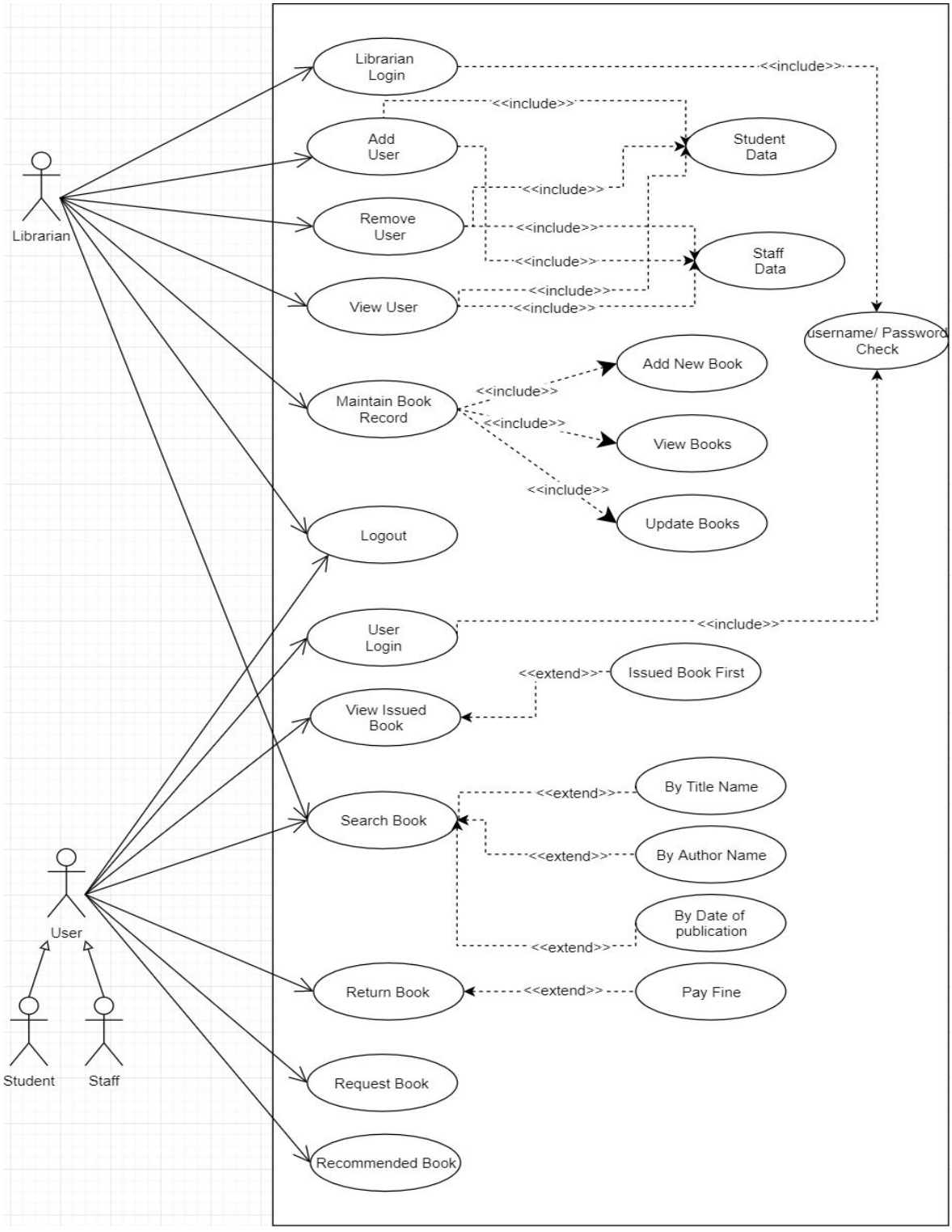
- To convenience, user borrows a book by searching in the database
- To implement Networking technologies into the system.
- To design a user-friendly graphical user interface that suits the users.
- To develop a network-based application for managing the library. Providing details of books and access to the user.
- “Library Management System” is to make easy access to book details to students and teachers. The system will be beneficial by providing a status of books as available or issued by someone.
- Through this system, one can maintain a record of books. It will be beneficial by providing the booking status due to which library users will save his or her time.

DESIGN METHOD

- The spiral model is a risk-driven software development process model.
- A spiral design methodology has been incorporated whilst designing the system.
- It formulates an incremental strategy every increment will result in removed errors debugged in previous rounds and thus multiple versions are produced.
- Following the spiral design method: alter user feedback new functionalities can easily be added i.e there remains scope for improvement.
- Based on the unique risk patterns of a given project, the spiral model guides a team to adopt elements of one or more process models, such as incremental, waterfall, or evolutionary prototyping.



USE CASE DIAGRAM



IDENTIFICATION OF USE CASES

Sr no.	Use Case Name
1	Librarian Login
2	Remove user
3	View User
4	Maintain Book Records
5	User Login
6	Issue Book
7	Search Book
8	Request Book
9	Recommend Book

USE CASE ELABORATION

Use Name	Librarian Login
Primary Actor	Librarian
Secondary Actor	Library Staff
Entry Condition	User/Librarian select LOGIN option.
Exit Condition	Login into the main menu of the librarian panel.

Event flow	1. This feature is used by the librarian to login to the application. 2. They required username and password to login to the application. 3. It verifies the username and password with data inside the database. 4. If the username is invalid and the password does not match then there will pop up a red label to tell the user password is incorrect. 5. If valid, the librarian successfully login into the application.

Use Name	Remove User
Primary Actor	Librarian
Secondary Actor	Library Staff
Entry Condition	Librarian select REMOVE USER option.
Exit Condition	After the user is removed from the database he will choose to use other options.
Event flow	1. This feature is used by the librarian to remove a user from the database. 2. Librarian required username and mobile no. to remove a user from the database. 3. It verifies the username and mobile no.with data inside the database to remove a user from the database. 4. If the username is not present in the database then there will pop up the red label to tell the user already removed. 5. If valid, the user successfully removes from the database.

Use Name	View User
Primary Actor	Librarian
Secondary Actor	-
Entry Condition	Librarian must be logged in
Exit Condition	Librarian has viewed all users i.e. the user which are registered in the system and he is directed to main window for performing other functions.
Event flow	1. This feature is used by the librarian to view the registered users in the system. 2. Users are classified as students and staff users. 3. Staff usernames and names are listed in Staff column and student username and name are listed in the student column. 4. The system will (highlight)mark the users whose due date for returning of books is over.

Use Name	Maintain Book Record
Primary Actor	Librarian
Secondary Actor	-
Entry Condition	The librarian must be logged into the system.
Exit Condition	Book Stock is updated in the system.

Event flow	1. This function is completely done by the librarian. 2. Librarian will add new book entry in the database and he add all details regarding the book such as Book name, Author, ISBN_no , number of copies, etc. 3. Librarian will update the information regarding the book. 4. Update book means if the book is misplaced by any user then a number of copies of the book is altered. 5. Librarians will able to view the books in the library.

Use Name	Request Book
Primary Actor	Student Teacher
Secondary Actor	Library Staff
Entry Condition	User Must be login into the system A user on clicking Request book button
Exit Condition	A user on clicking on submit request button
Event flow	6. User clicks on the request book button. 7. On request book, button click event Book Manager sends a request form to the library system. And the library system displays it to the user. 8. The user enters details about the book such as the importance and need of a book. 9. On clicking on submit request book button details gets stored. Now, the system performs computation on request and forms priority on it. 10. Book Manager notifies all such higher priority requests.

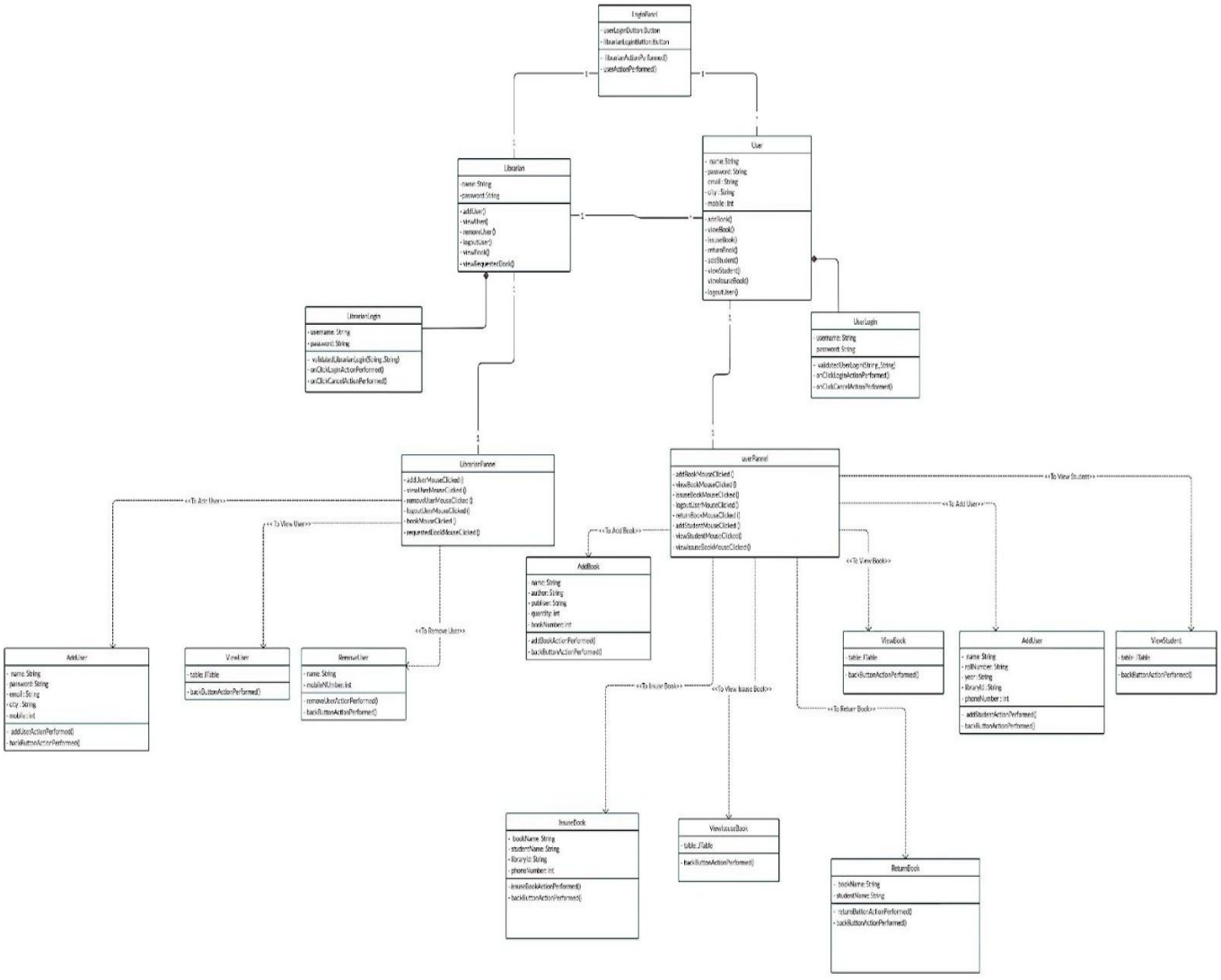
Use Name	Search Book
Primary Actor	Student Teacher
Secondary Actor	
Entry Condition	User must be logged into the system Clicking and typing in search box
Exit Condition	On selecting a book from the listed book Or on deselecting search box
Event flow	1. The user clicks on the search box. 2. The user starts typing in the search box. 3. Users can type the name of the book / Author name / ISBN of the book. 4. Searched Request to get forward to the Book Manager. 5. The book Manager performs computation based on search requests in the search box.

	6. After performing the computation book Manager list the most matched book in a drop-down dynamic list. 7. Users can click and select a book. 8. On selecting a book user can get more details about the selected books of interest.

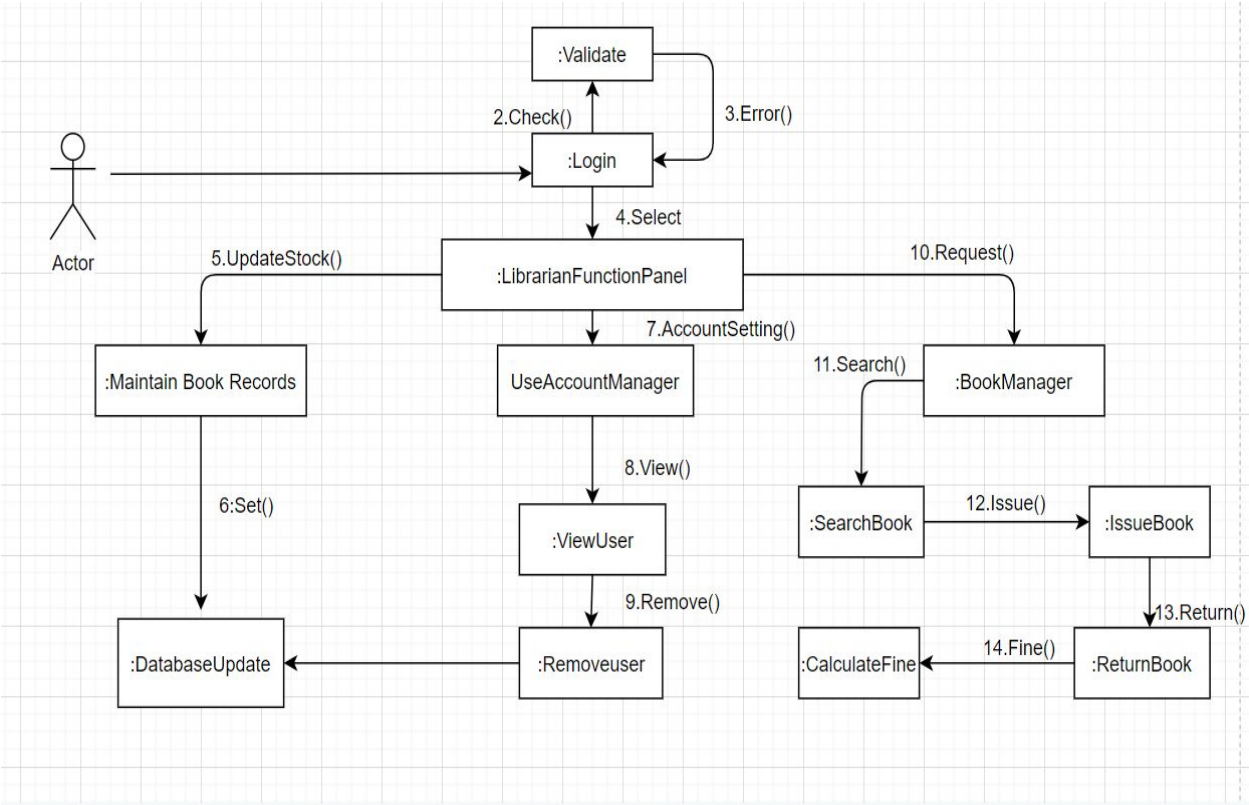
UseCase Name	Issue Book
Primary Actor	library staff
Secondary Actor	user
Entry Condition	The librarian must be logged into the system.
Exit Condition	Librarian on clicking on the Issue book button
Event flow	1. Users can issue books from the library. 2. User has to issue book from library which may be booked already through the application or by searching book manually. 3. The book can be booked by the user through the application by logging in to it. 4. At last library staff will make a book issue by using user Library ID based on it eligibility criteria. 5. The entry of book issued will be inserted into the database.

UseCase Name	Return Book
Primary Actor	library staff
Secondary Actor	
Entry Condition	The librarian must be logged in the system.
Exit Condition	Librarian on clicking on the Issue book button
Event flow	1. At the end of the timeline the user has to return the book back to the library or re-issue the book. 2. At time of return library staff checks whether the user has crossed the timeline of returning or not. 3. Based on this condition fine is calculated 4. At the time of returning the book the user has to pay a fine if any. 5. Hence the database record will be maintained,

CLASS DIAGRAM

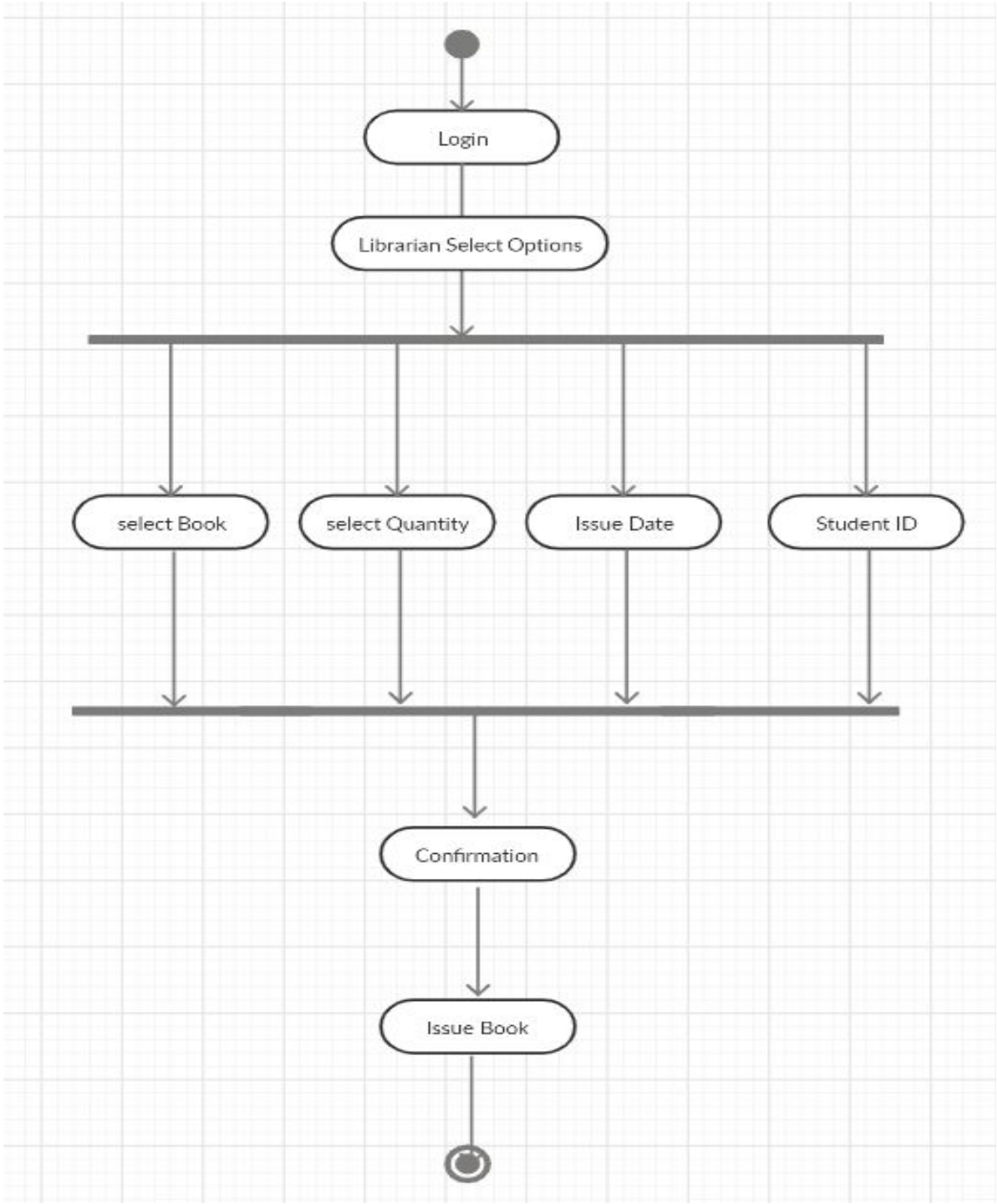


COMMUNICATION DIAGRAM

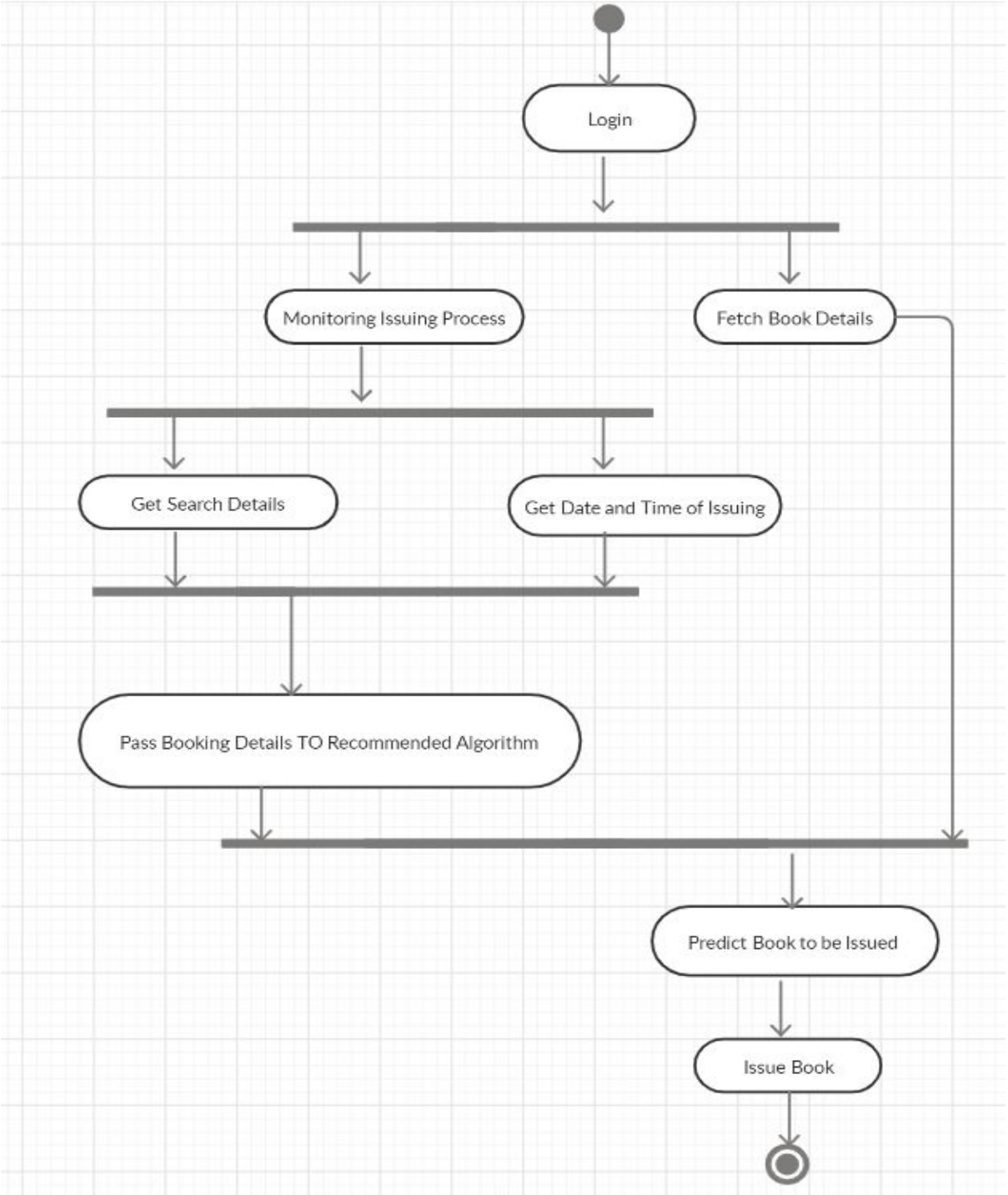


ACTIVITY DIAGRAM

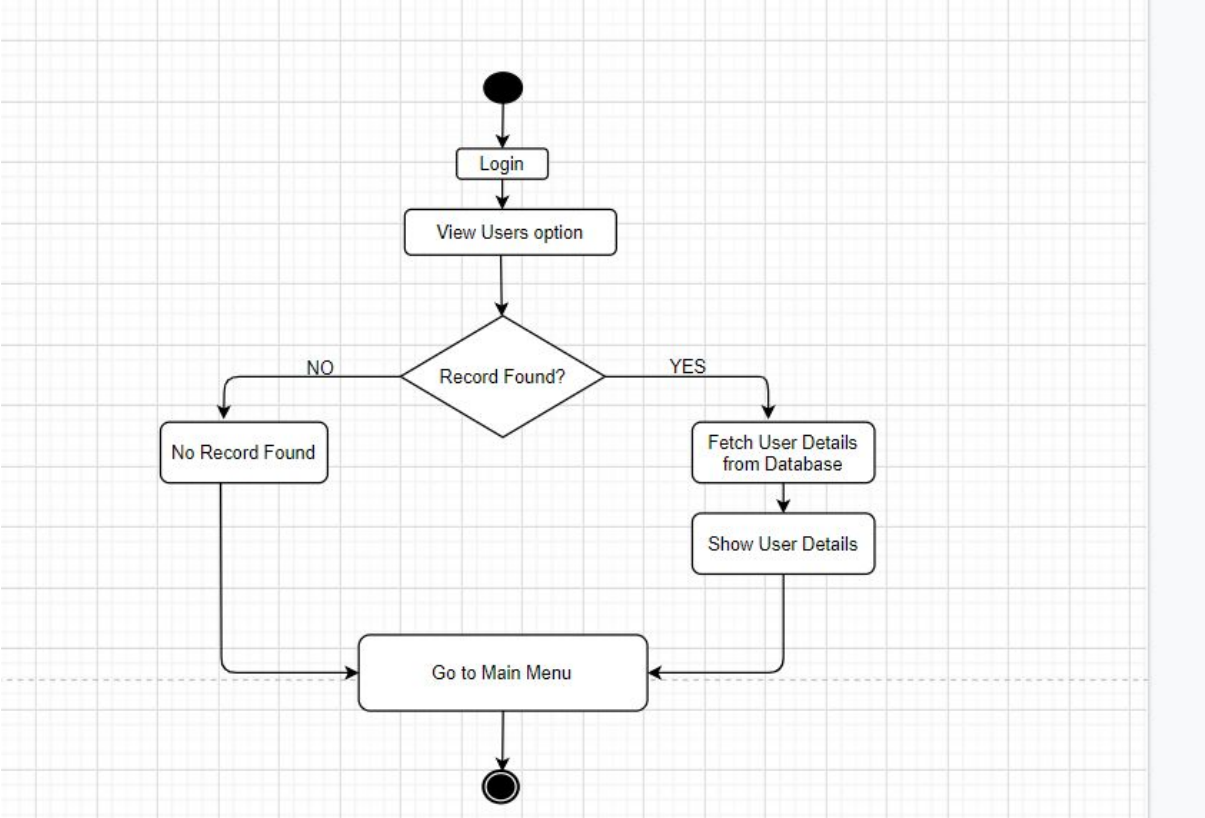
1] Issue Book



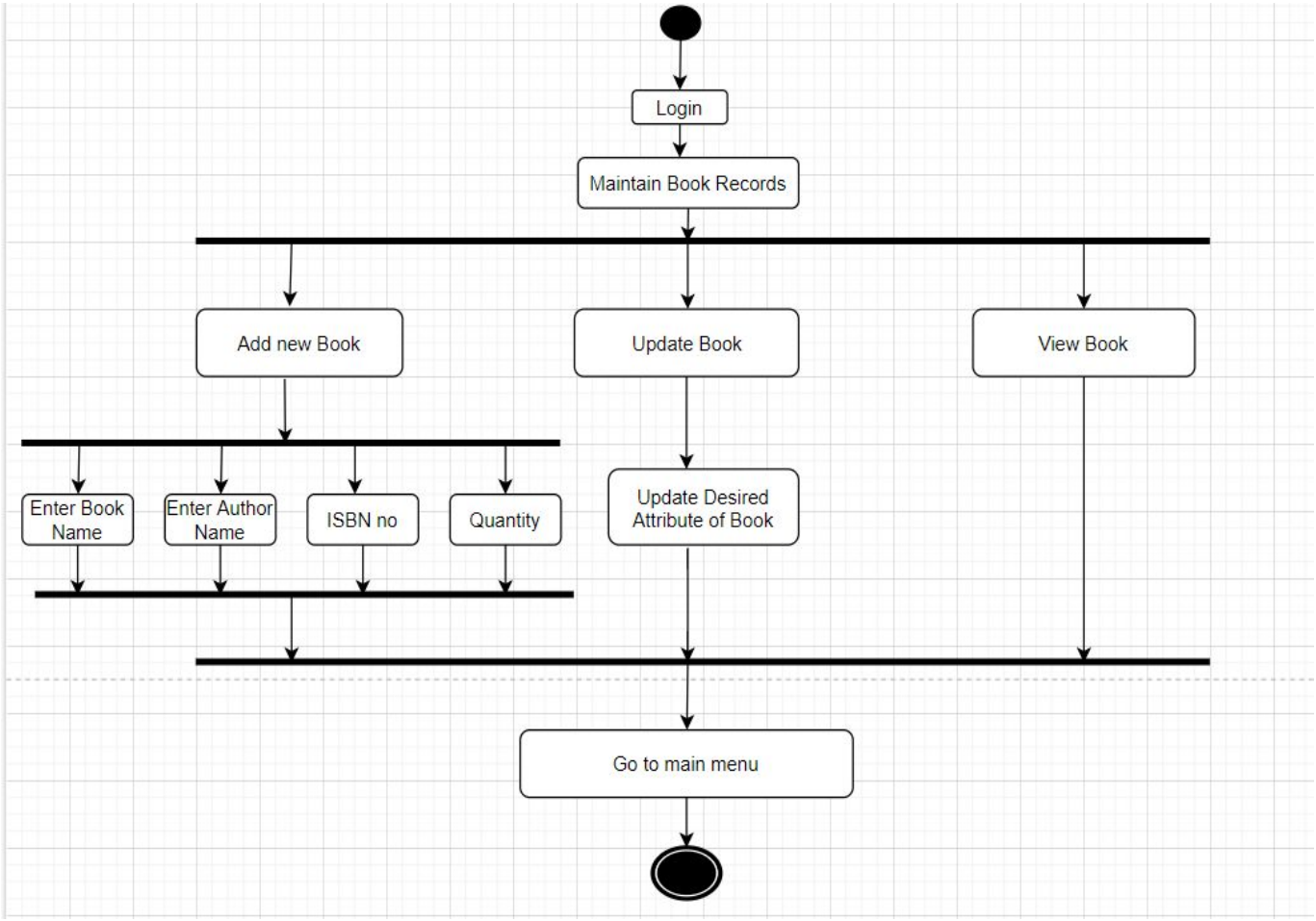
2] Recommending Books



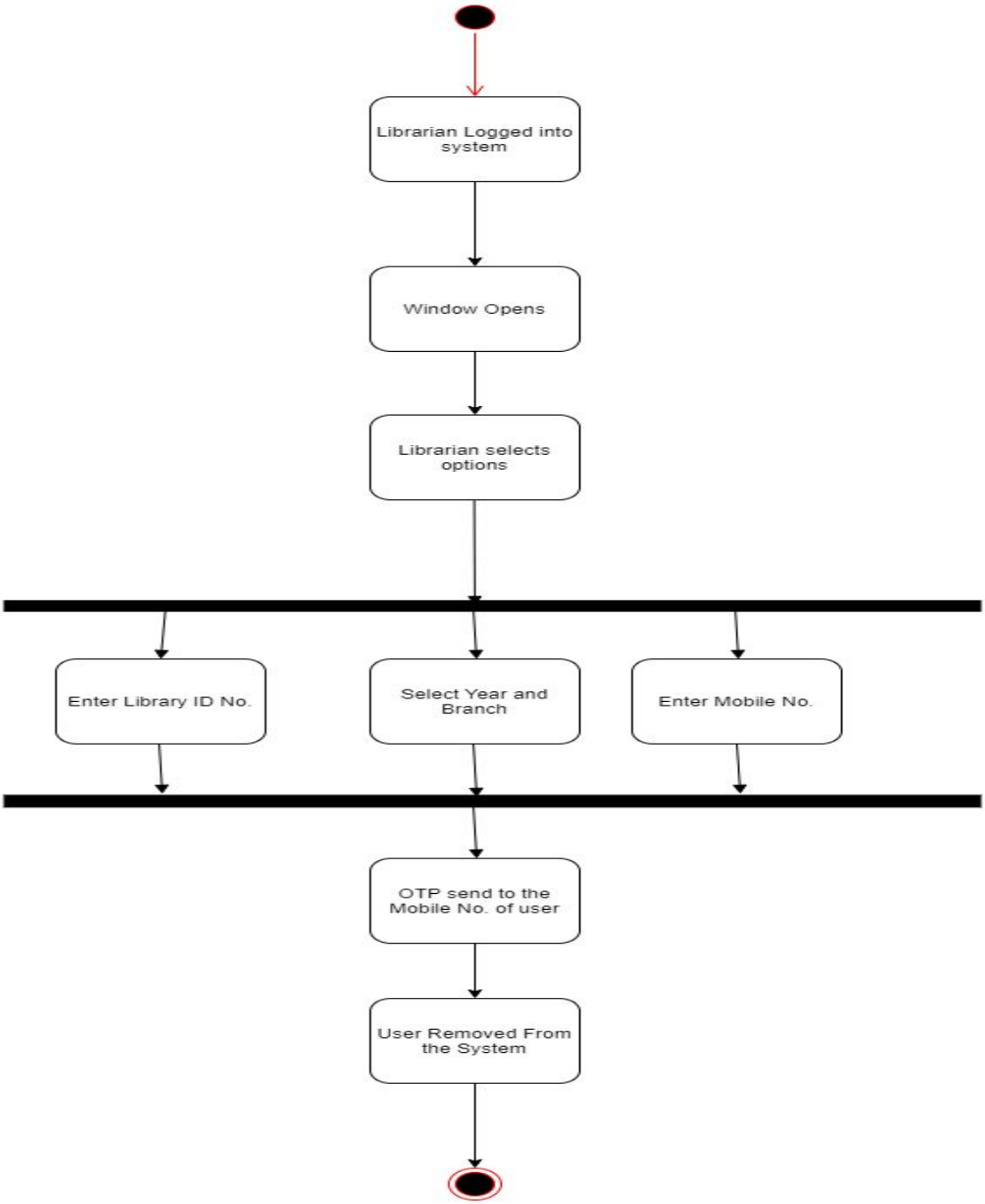
3]View User


Login
View Users option
Record Found?
NO
YES
No Record Found
Fetch User Details from Database
Show User Details
Go to Main Menu

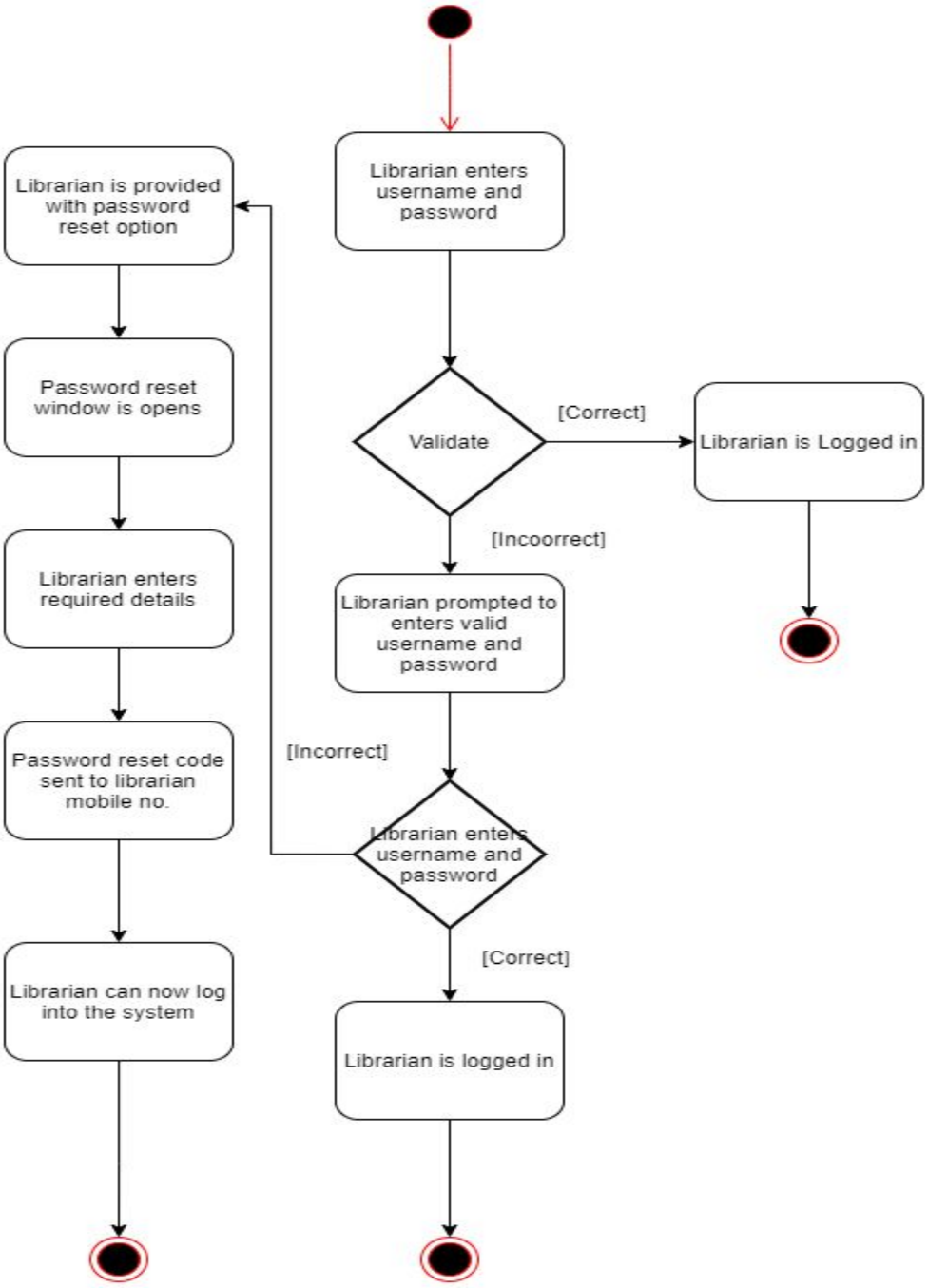
4]Maintain Book Records



5]Remove User

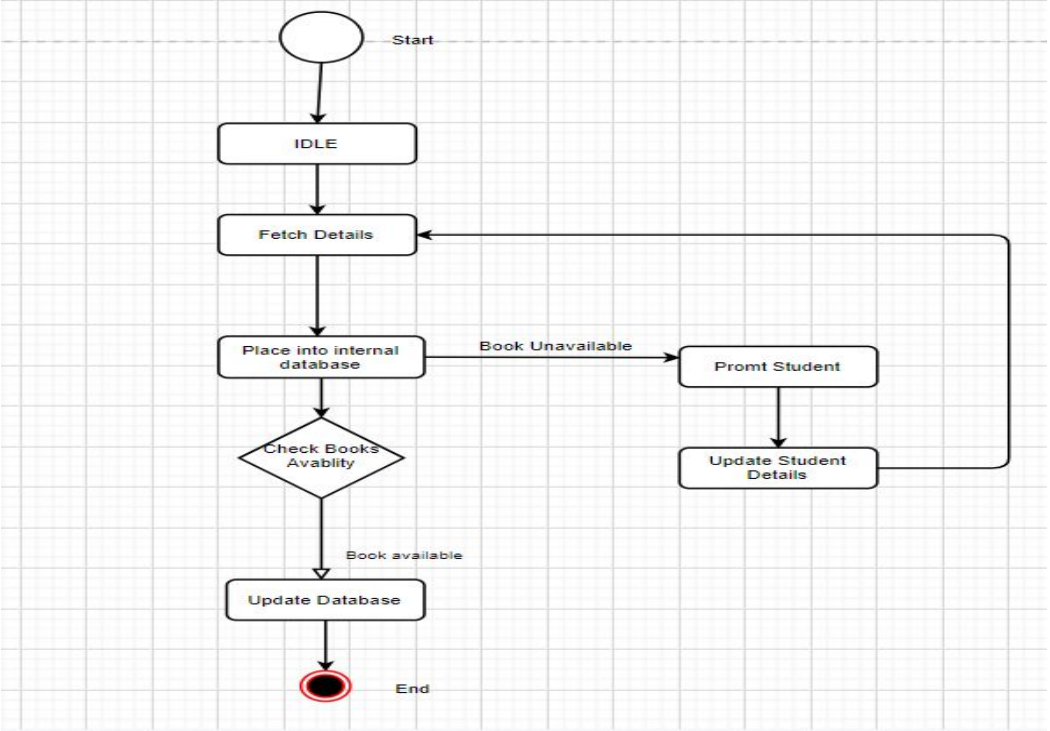


6]Librarian Login

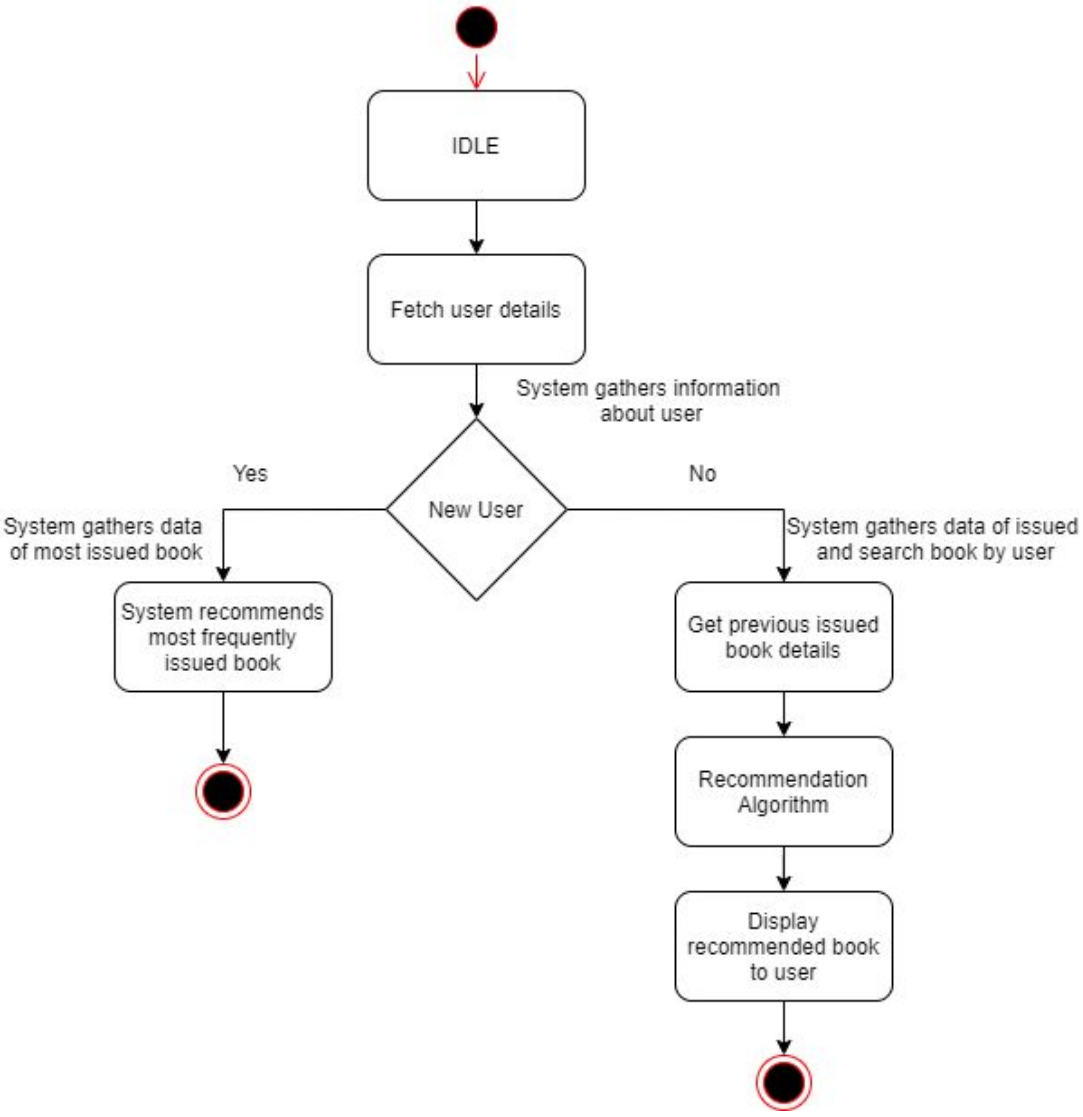


STATE CHART DIAGRAM

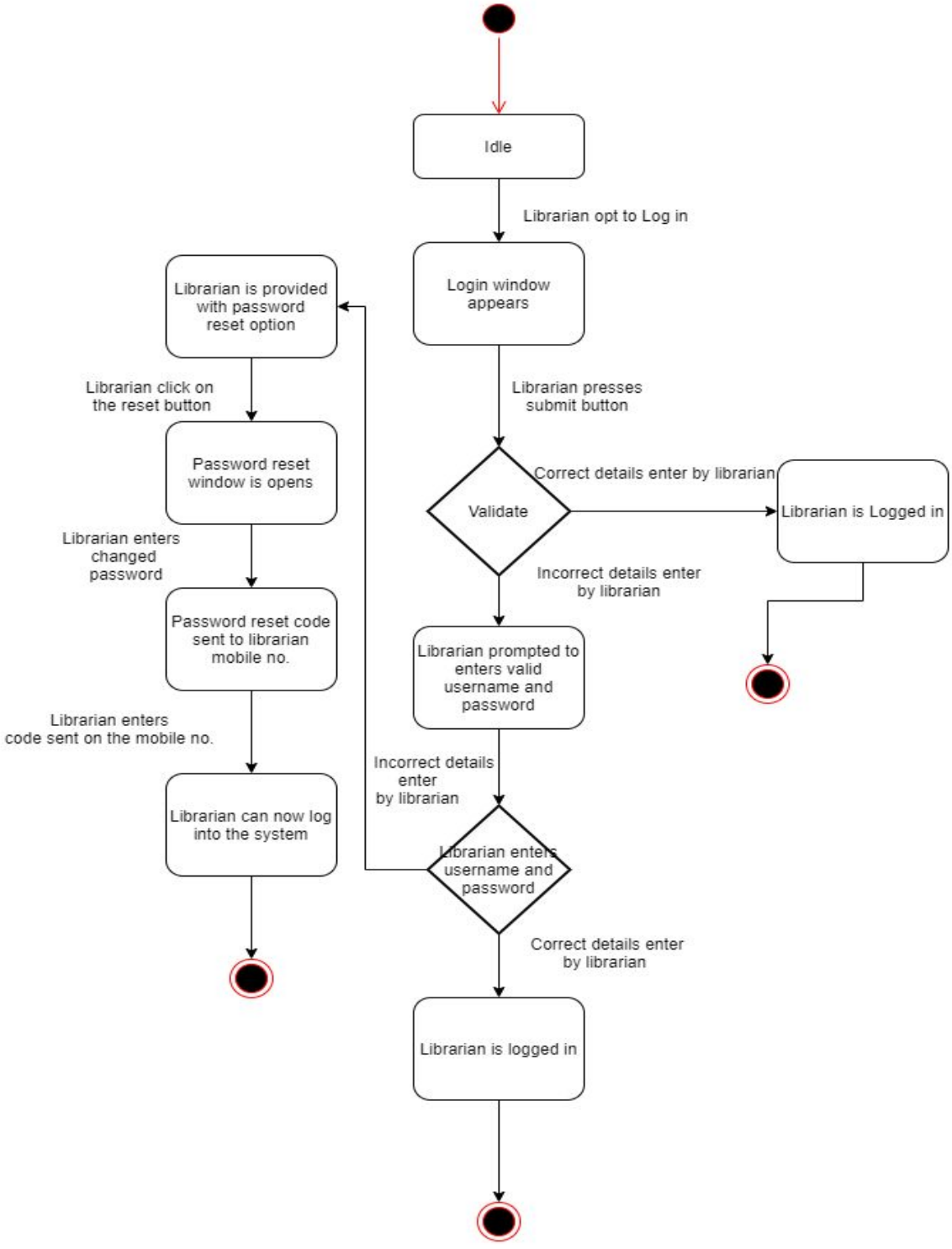
1] Search Book



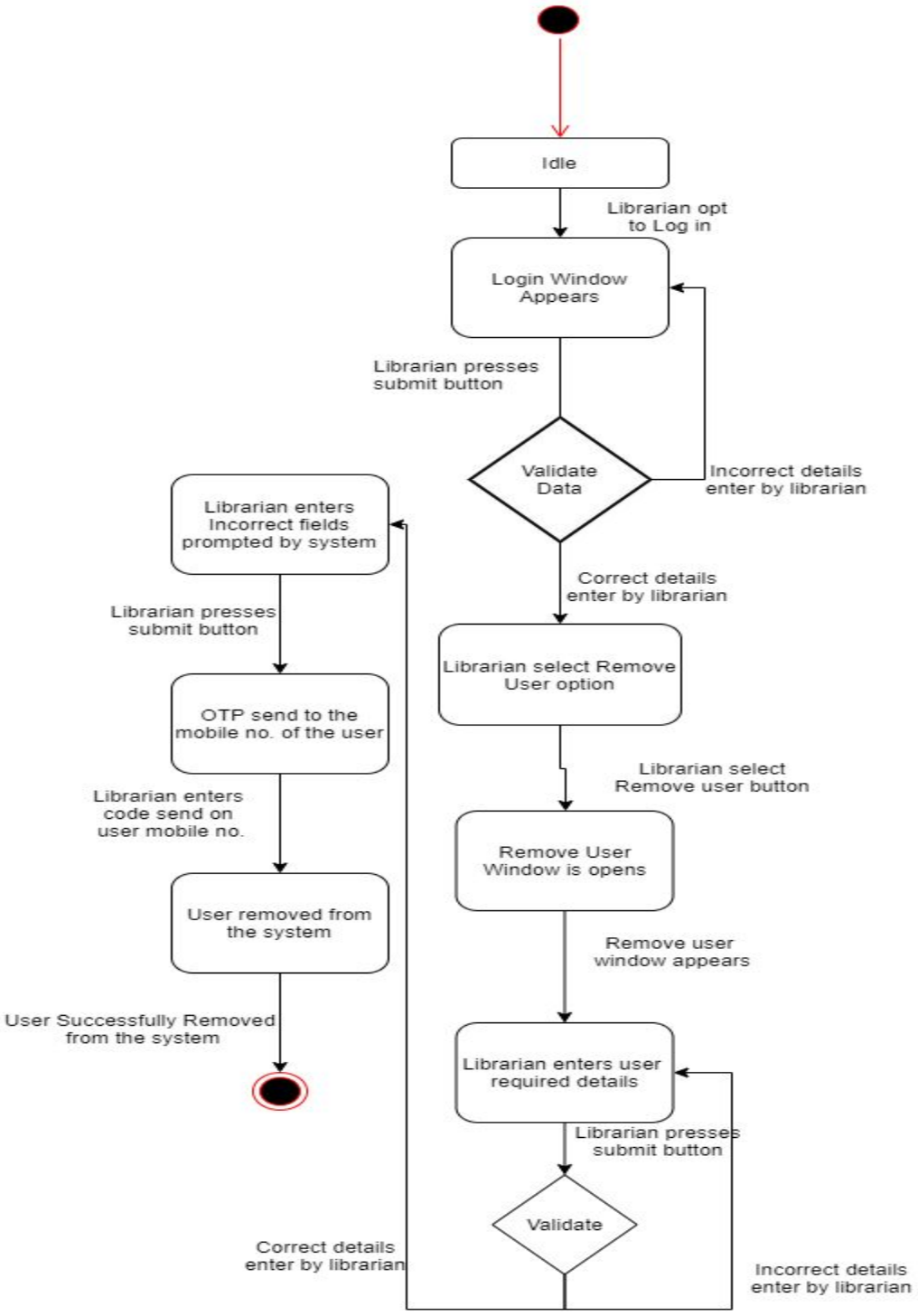
2] Recommend Book



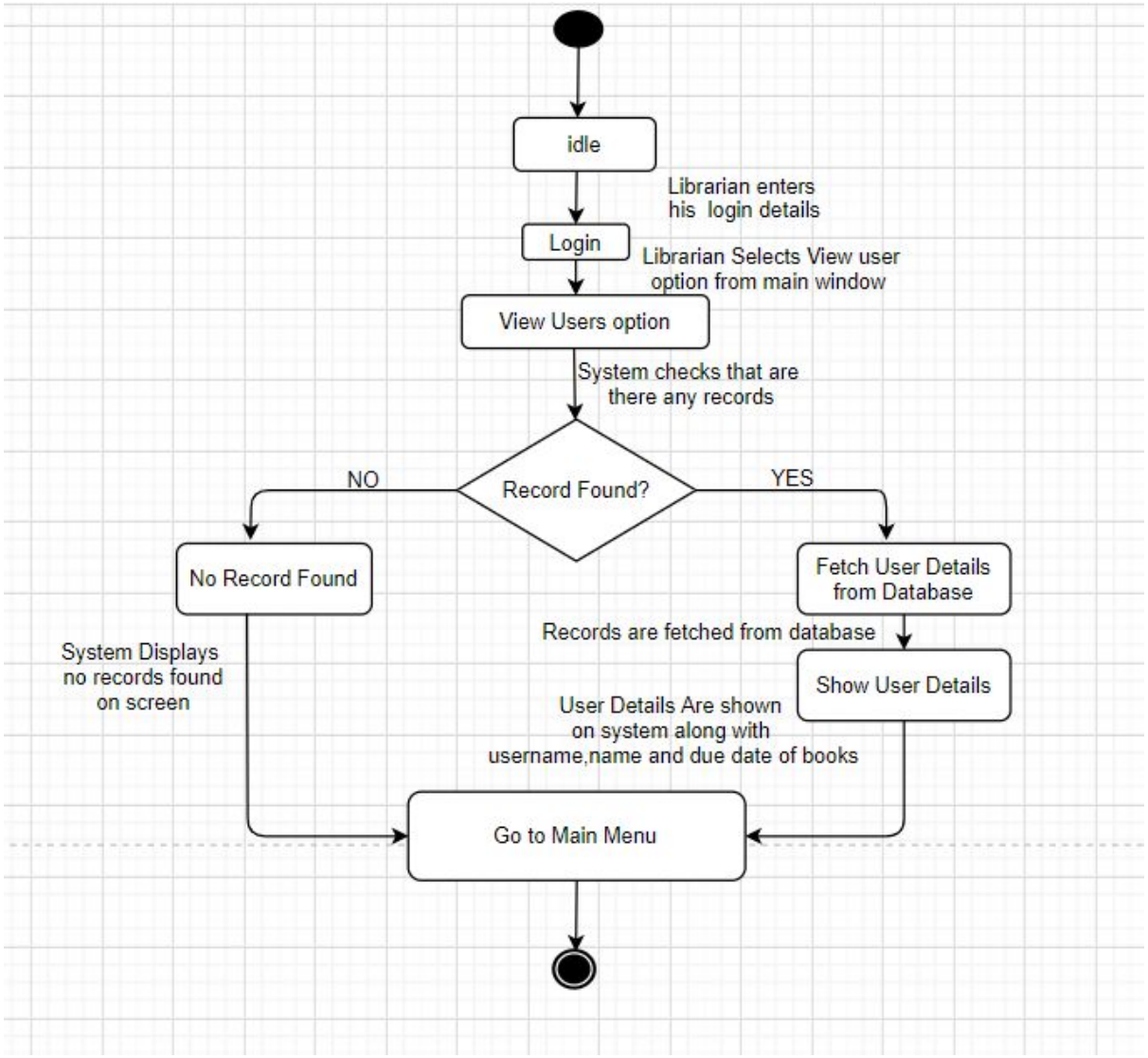
3] Librarian Login



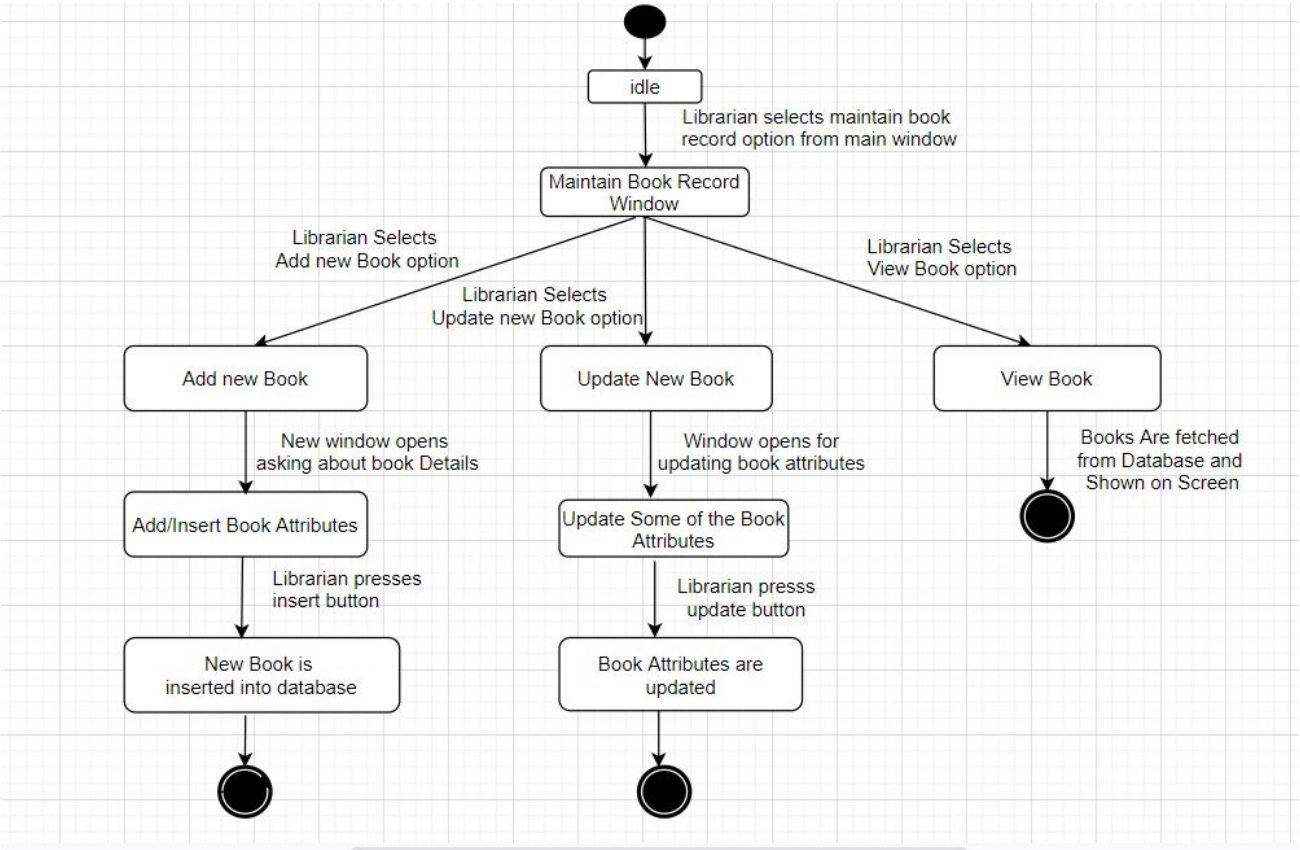
4] Remove user



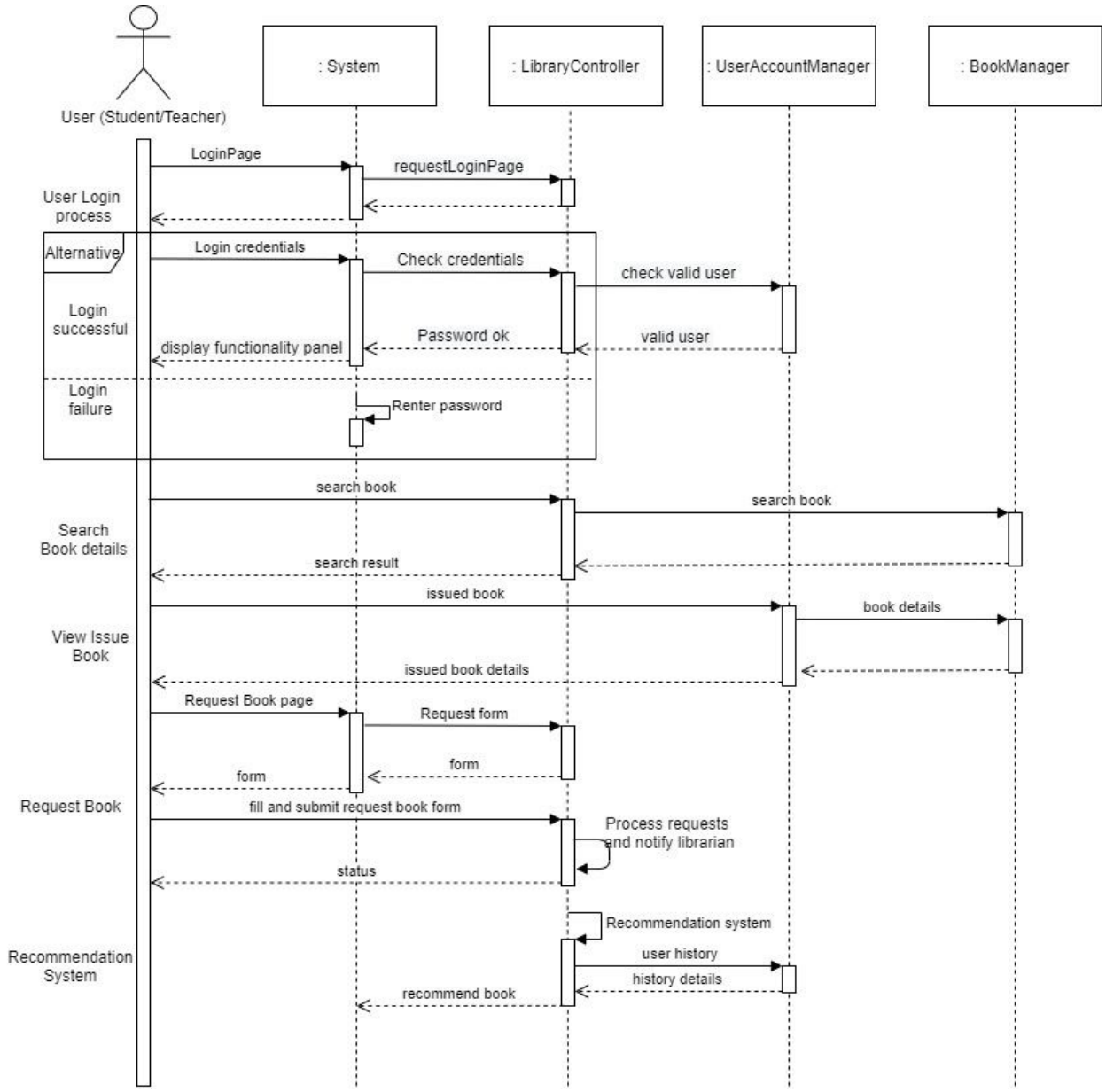
View User


idle
Librarian enters his login details
Login
Librarian Selects View user option from main window
View Users option
System checks that are there any records
Record Found?
NO
YES
No Record Found
Fetch User Details from Database
Records are fetched from database
System Displays no records found on screen
Show User Details
User Details Are shown on system along with username,name and due date of books
Go to Main Menu

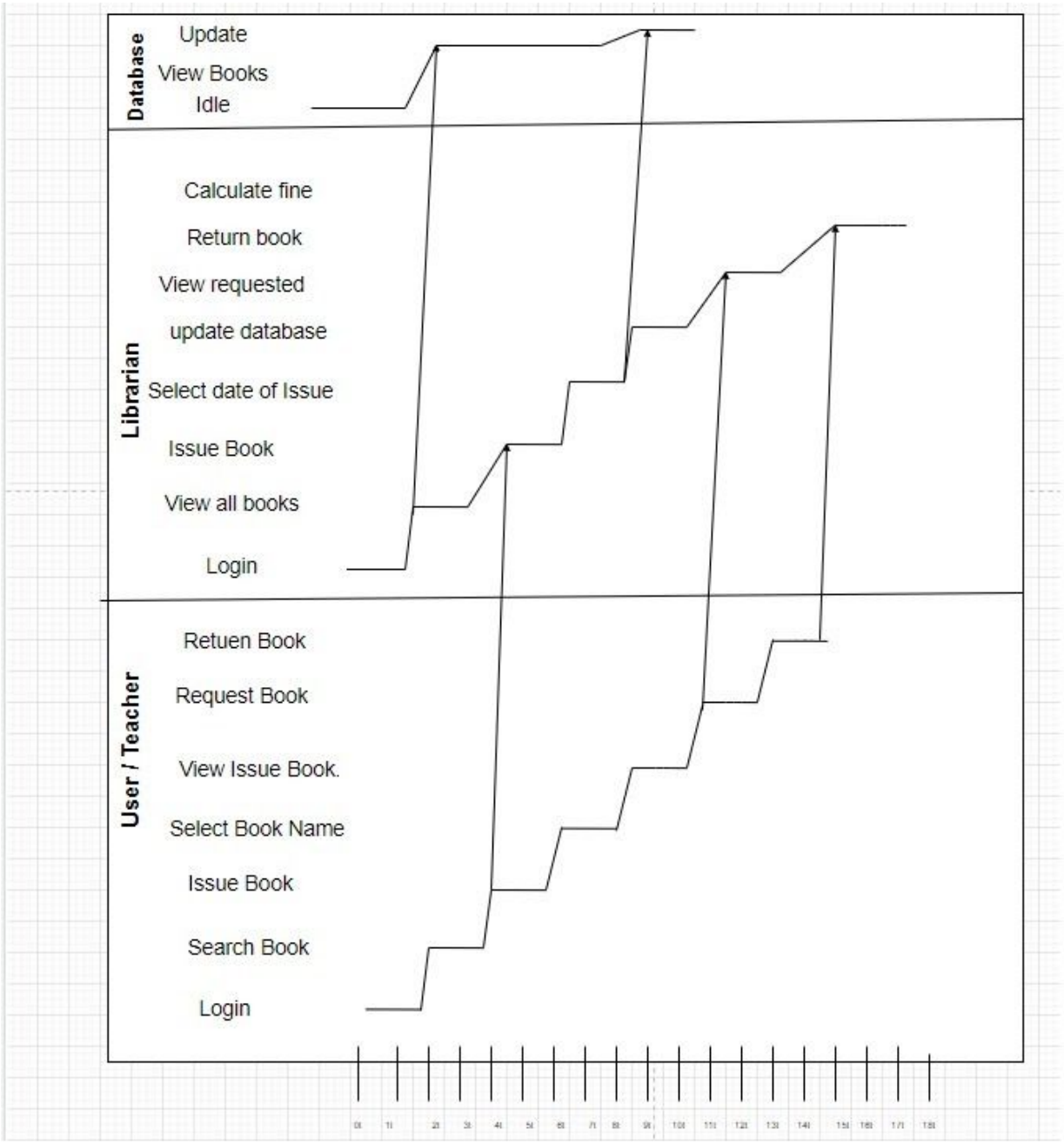
Maintain Book Record



SEQUENCE DIAGRAM



TIMING DIAGRAM



ARCHITECTURAL STYLE

The architectural style is a very specific solution to a particular software which typically focuses on how to organize the code created for the software. It is the granularity of the highest level that focuses on creating the layers and modules of the software and allowing an appropriate interaction between the various modules for giving the right results upon implementation.

The architectural pattern is the description of relationship types and elements along with a set of constraints to implementing a software system. The patterns are usually reusable solutions for common problems or models.

There are various types of architectural styles followed for software creation. In this lesson, we discuss data-centric, object-oriented, and layered architectural patterns.

1. Data-centered architecture

- The data store in the file or database is occupying at the center of the architecture.
- Store data is accessed continuously by the other components like an update, delete, add, modify from the data store.
- Data-centered architecture helps integrity.
- Pass data between clients using the blackboard mechanism.
- The processes are independently executed by the client components.

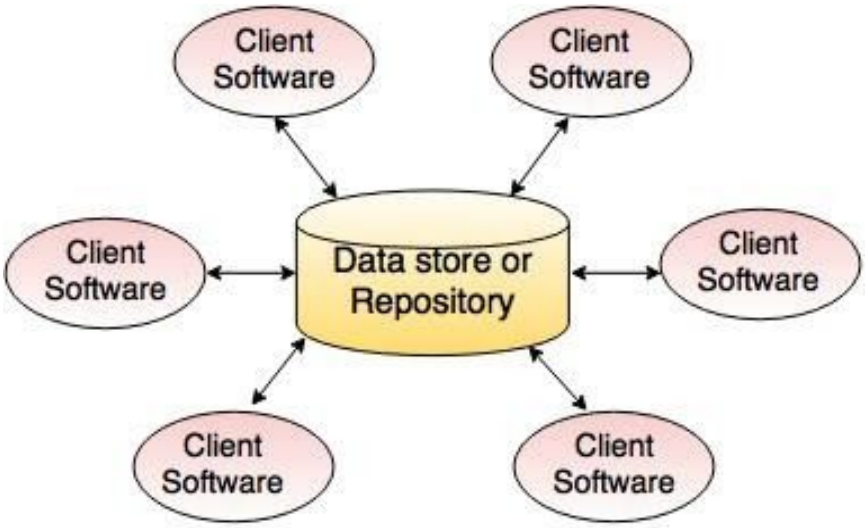


Fig.- Data centered architecture

DESIGN PATTERN

- In software engineering, a software design pattern is a general, reusable solution to a commonly occurring problem within a given context in software design.
- It is not a finished design that can be transformed directly into source or machine code. Rather, it is a description or template for how to solve a problem that can be used in many different situations. Design patterns are formalized best practices that the programmer can use to solve common problems when designing an application or system.
- Object-oriented design patterns typically show relationships and interactions between classes or objects, without specifying the final application classes or objects that are involved. Patterns that imply mutable state may be unsuited for functional programming languages, some patterns can be rendered unnecessary in languages that have built-in support for solving the problem they are trying to solve, and object-oriented patterns are not necessarily suitable for non-object-oriented languages.
- Design patterns may be viewed as a structured approach to computer programming intermediate between the levels of a programming paradigm and a concrete algorithm.