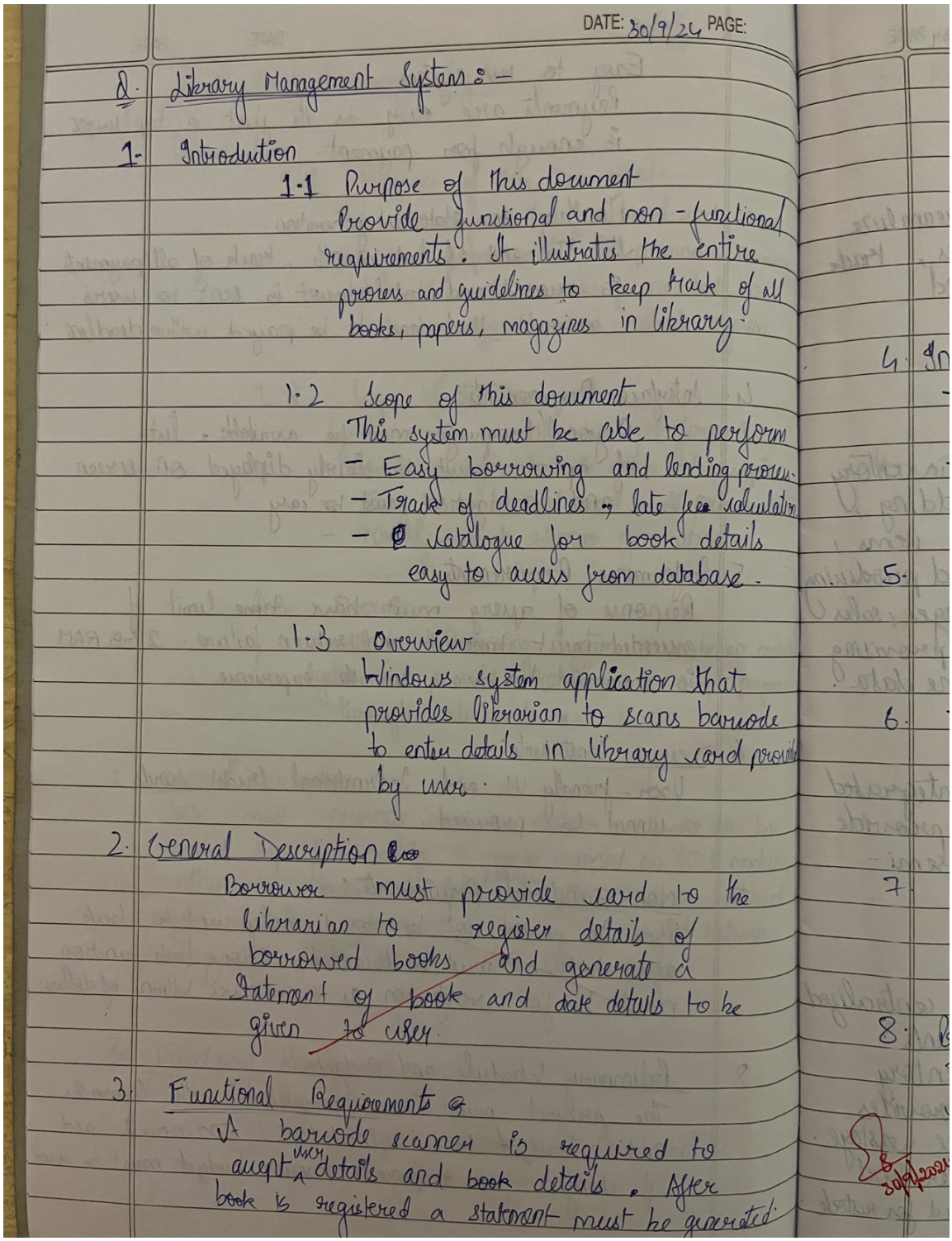
## 2. Library Management System

### a. SRS Document:



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Q. Library Management System :-

1. Introduction

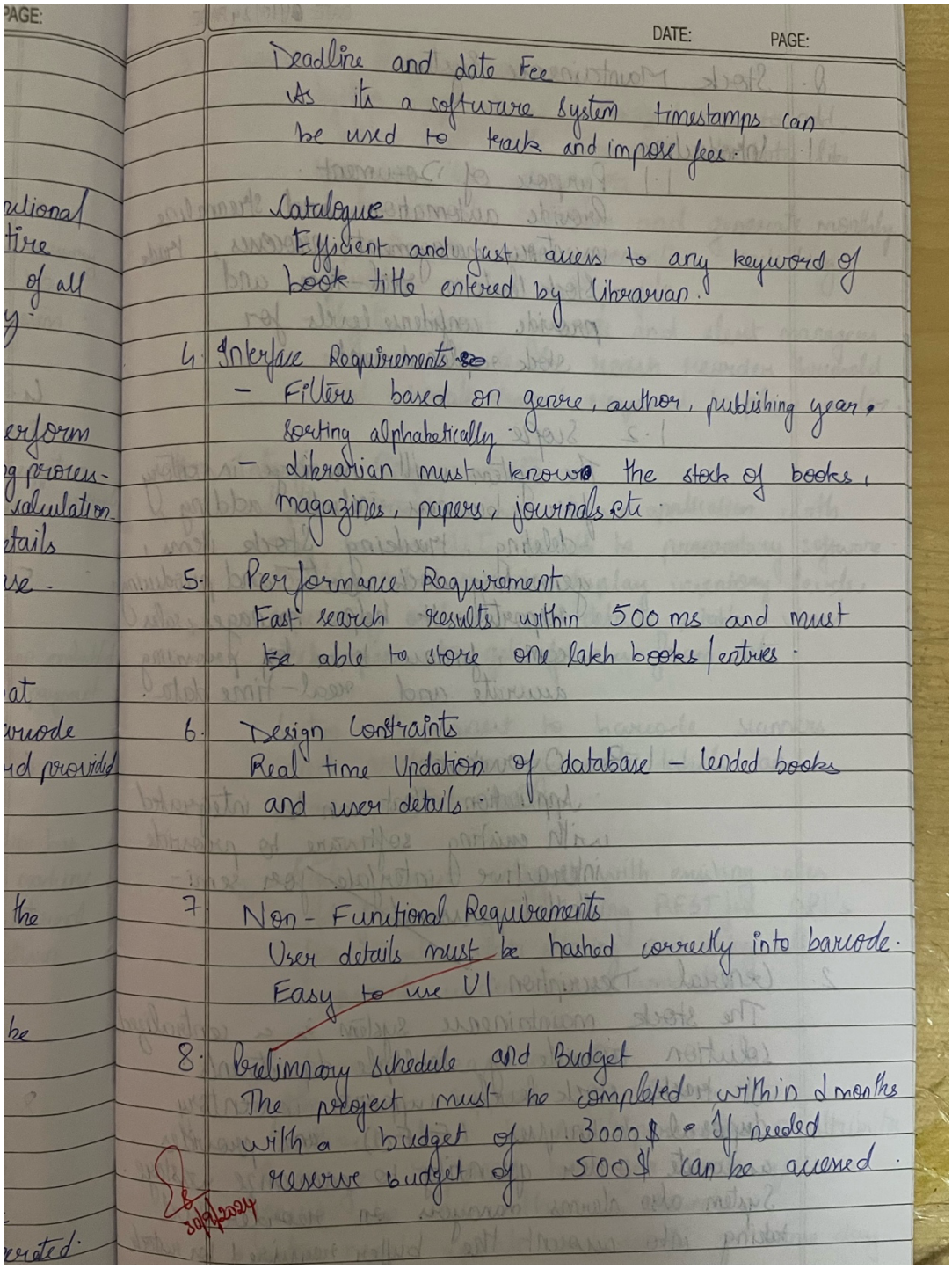
1.1 Purpose of this document
Provide functional and non-functional requirements. It illustrates the entire process and guidelines to keep track of all books, papers, magazines in library.

1.2 Scope of this document
This system must be able to perform
- Easy borrowing and lending process
- Track of deadlines, late fee calculation
- Catalogue for book details easy to access from database.

1.3 Overview
Windows system application that provides librarian to scans barcode to enter details in library card provided by user.

2. General Description
Borrower must provide card to the librarian to register details of borrowed books and generate a statement of book and date details to be given to user.

3. Functional Requirements
A barcode scanner is required to accept user details and book details. After book is registered a statement must be generated.



Deadline and late Fee
As it's a software system timestamps can be used to track and impose fees.

Catalogue
Efficient and fast access to any keyword of book title entered by librarian.

4. Interface Requirements
- Filters based on genre, author, publishing year, sorting alphabetically.
- Librarian must know the stock of books, magazines, papers, journals etc.

5. Performance Requirement
Fast search results within 500 ms and must be able to store one lakh books/entries.

6. Design Constraints
Real time updation of database - lended books and user details.

7. Non-Functional Requirements
User details must be hashed correctly into barcode.
Easy to use UI

8. Preliminary schedule and Budget
The project must be completed within 2 months with a budget of 3000$. If needed reserve budget of 500$ can be accessed.

8 sept 2024

## b.Advanced Class Diagram:

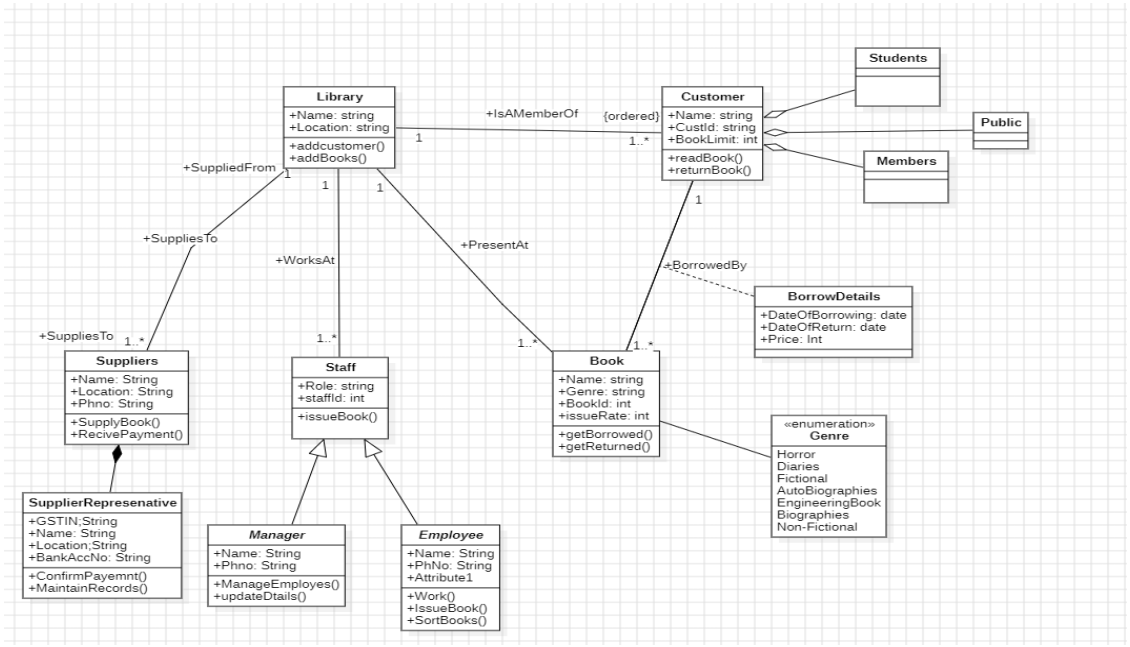
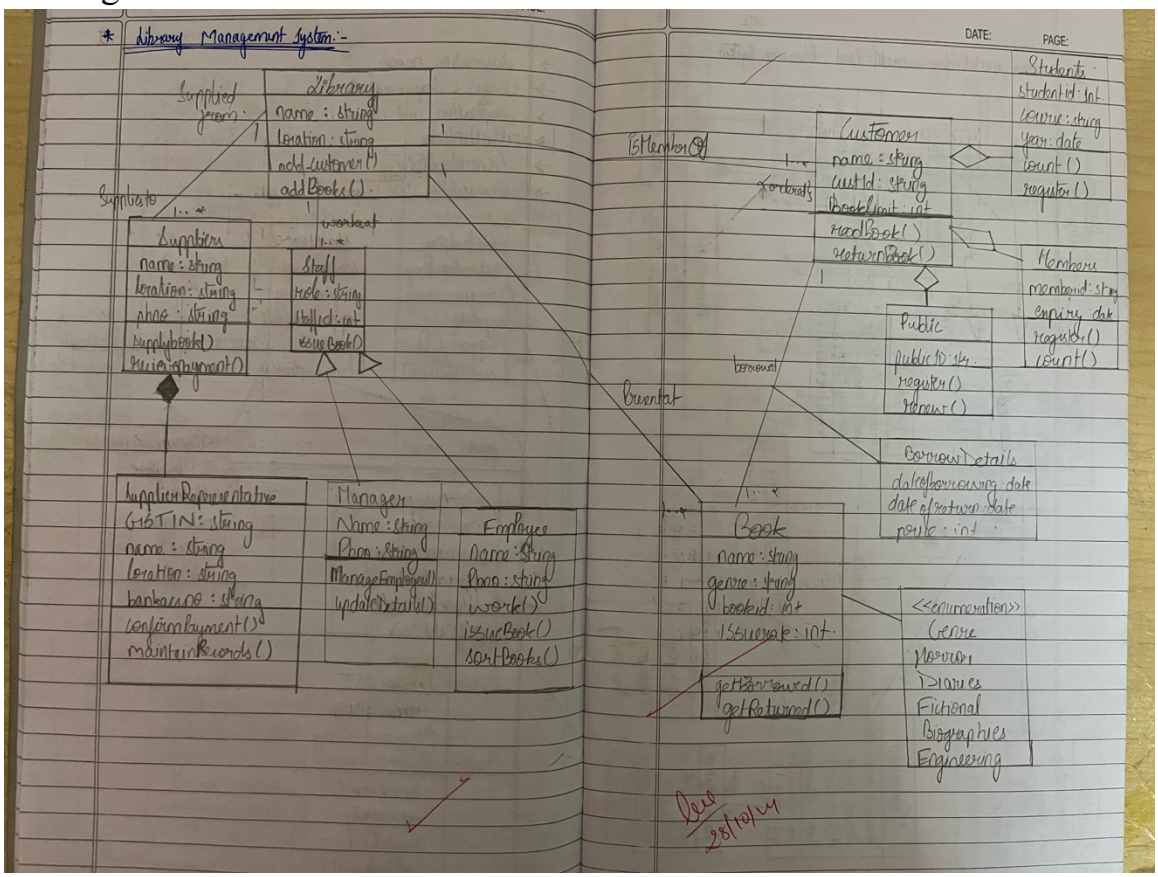



Fig 2.2:



## c.Advanced State Diagram:

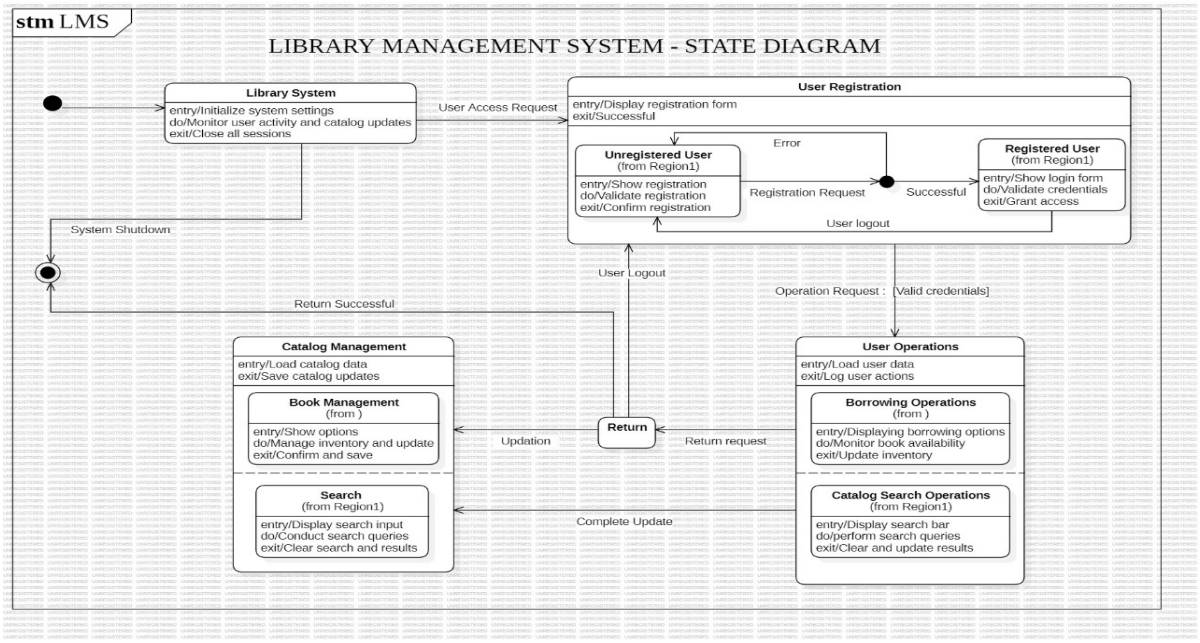
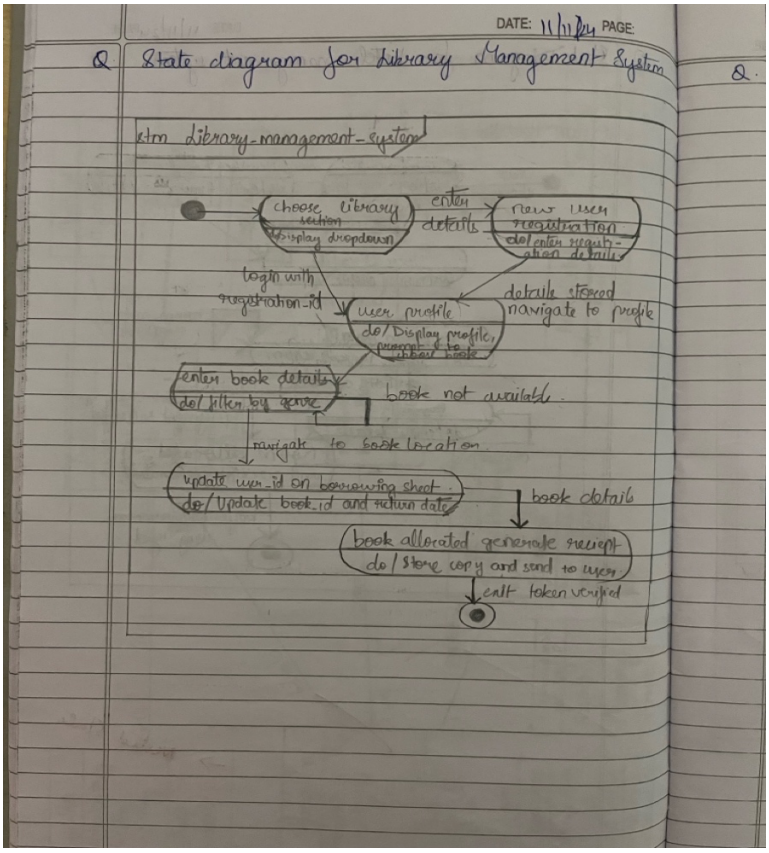



Fig 2.3:



## d.Use Case Diagram:

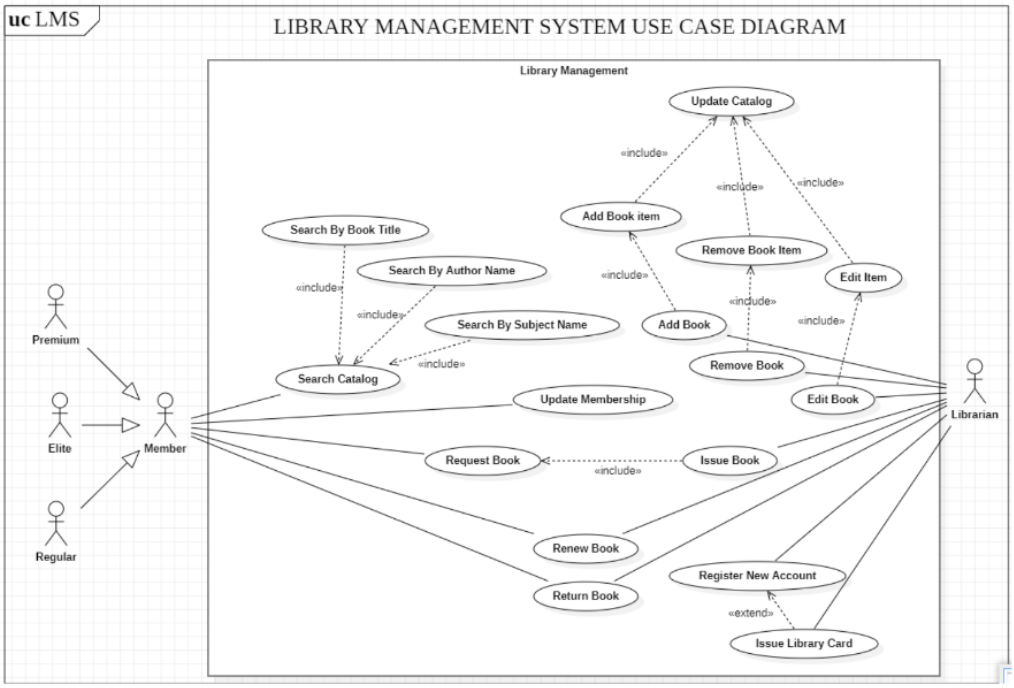
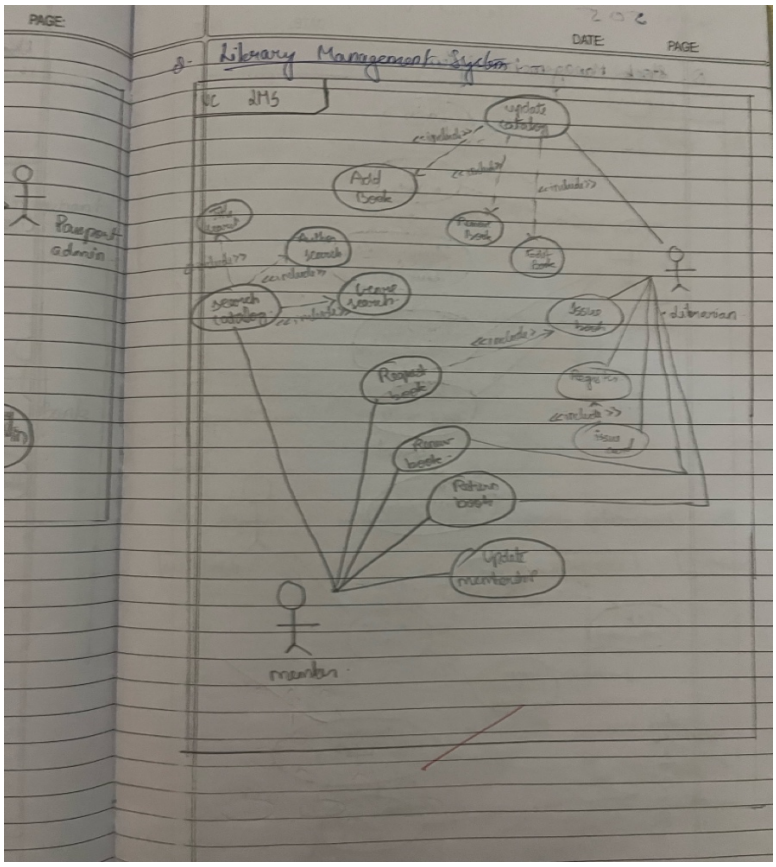



Fig 2.4:




## e.Sequence Diagram:

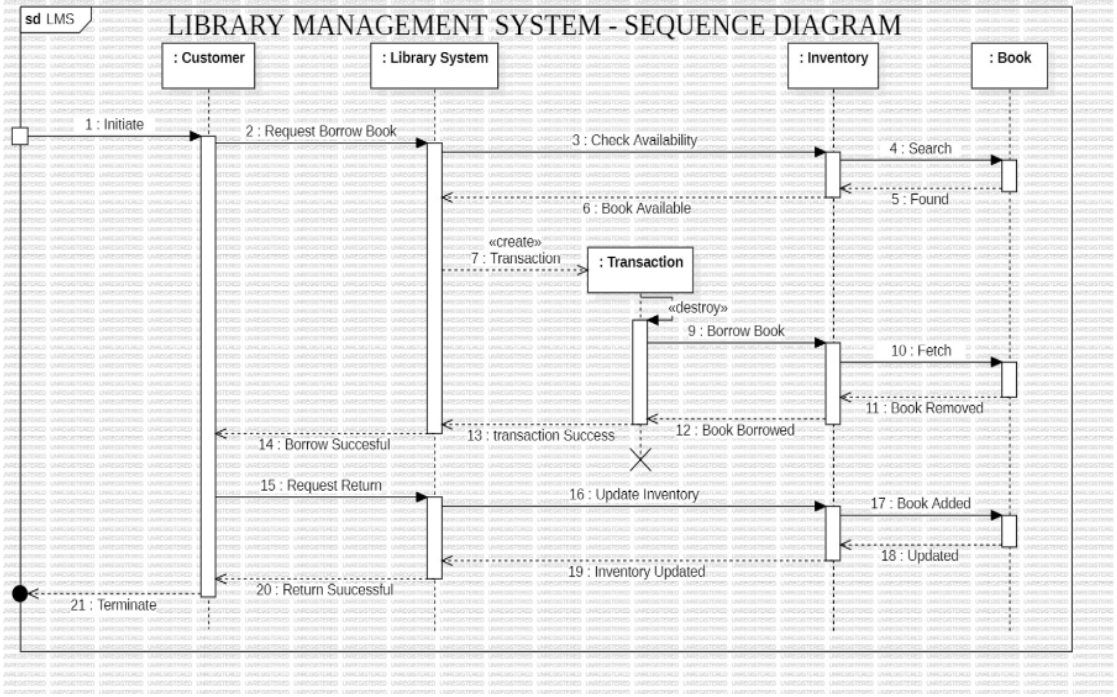
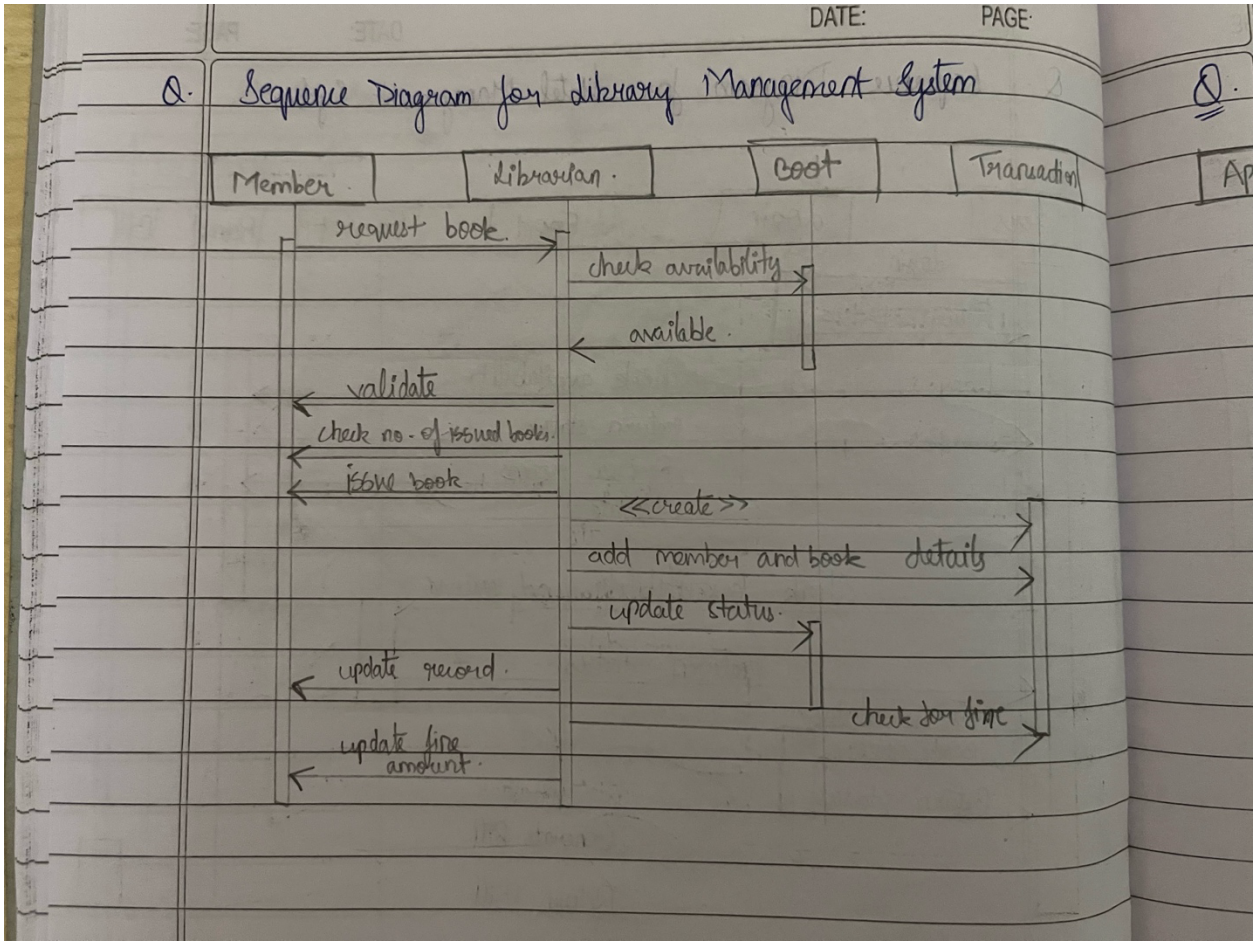



Fig 2.5: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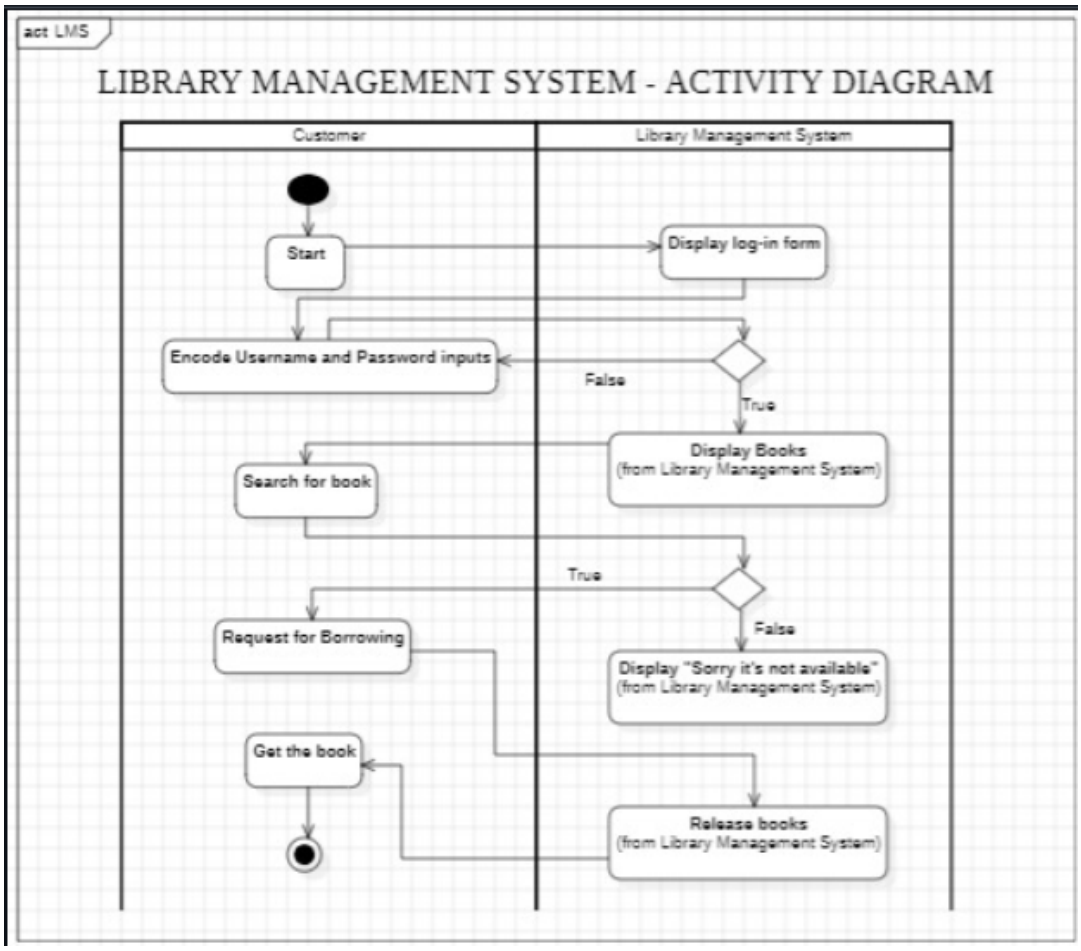
Q. Sequence Diagram for library Management System
Member
Librarian
Book
Transaction
request book.
check availability
available.
validate
check no. of issued books.
issue book
<<create>>
add member and book details
update status.
update record.
check for fine
update fine amount.

## f.Activity Diagram:




**Actors**:

- **Customer**: Represents the user interacting with the system.
- **Library Management System**: Represents the system itself.

**Process Flow**:

- The customer starts by logging in, encoding their username and password.
- The system validates the credentials. If invalid, the process stops; if valid,proceeds.
- The customer searches for a book. The system checks the book's availability:
  - If the book is unavailable, the system displays a "not available" message.
  - If available, the customer requests to borrow the book, and the system releases it to them.

**Decisions**:

- There are decision points for login validation and book availability, indicating alternate flows.

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Q. Library Management System Activity Diagram