

Functional Requirements:

1. User Authentication:

- Librarian should be able to log in using a valid username and password.
- Librarian should have the option to sign up for a new account.

2. Book Management:

- Librarian can add new books to the system with details such as title, author, ISBN, genre, and quantity available.
- Librarian can view the list of all books available in the library.
- Each book should have a unique identifier.

3. Student Management:

- Librarian can add new students to the system with details such as student ID, name, contact information, and class.
- Librarian can view the information of all registered students.

4. Book Issuing:

- Librarian can issue a book to a student, with a maximum limit of 3 books per student.
- The system should track the issuance date and due date for each book.

5. Book Return:

- Librarian can process the return of a book, updating the system to reflect that the book is now available.
- The system should track the return date.

6. Book Details:

- Librarian can view detailed information about a specific book, including its availability status and the students to whom it is currently issued.

7. Transaction History:

- The system should maintain a transaction history, logging details of each book issuance and return, including the student and librarian involved, as well as dates.

Non-functional Requirements:

1. Security:

- User authentication information should be securely stored and transmitted.
- Access to sensitive information (such as student details and transaction history) should be restricted to authorized users.

2. Performance:

- The system should respond to user requests promptly, ensuring a smooth and efficient experience for the librarian.

3. Scalability:

- The system should be designed to handle a growing number of books, students, and transactions without a significant degradation in performance.

4. Reliability:

- The system should be reliable, with minimal downtime for maintenance and updates.

5. User Interface:

- The user interface should be intuitive and user-friendly to facilitate easy navigation for the librarian.

6. Data Backup:

- Regular automated backups of the system's data should be performed to prevent data loss in case of system failures.

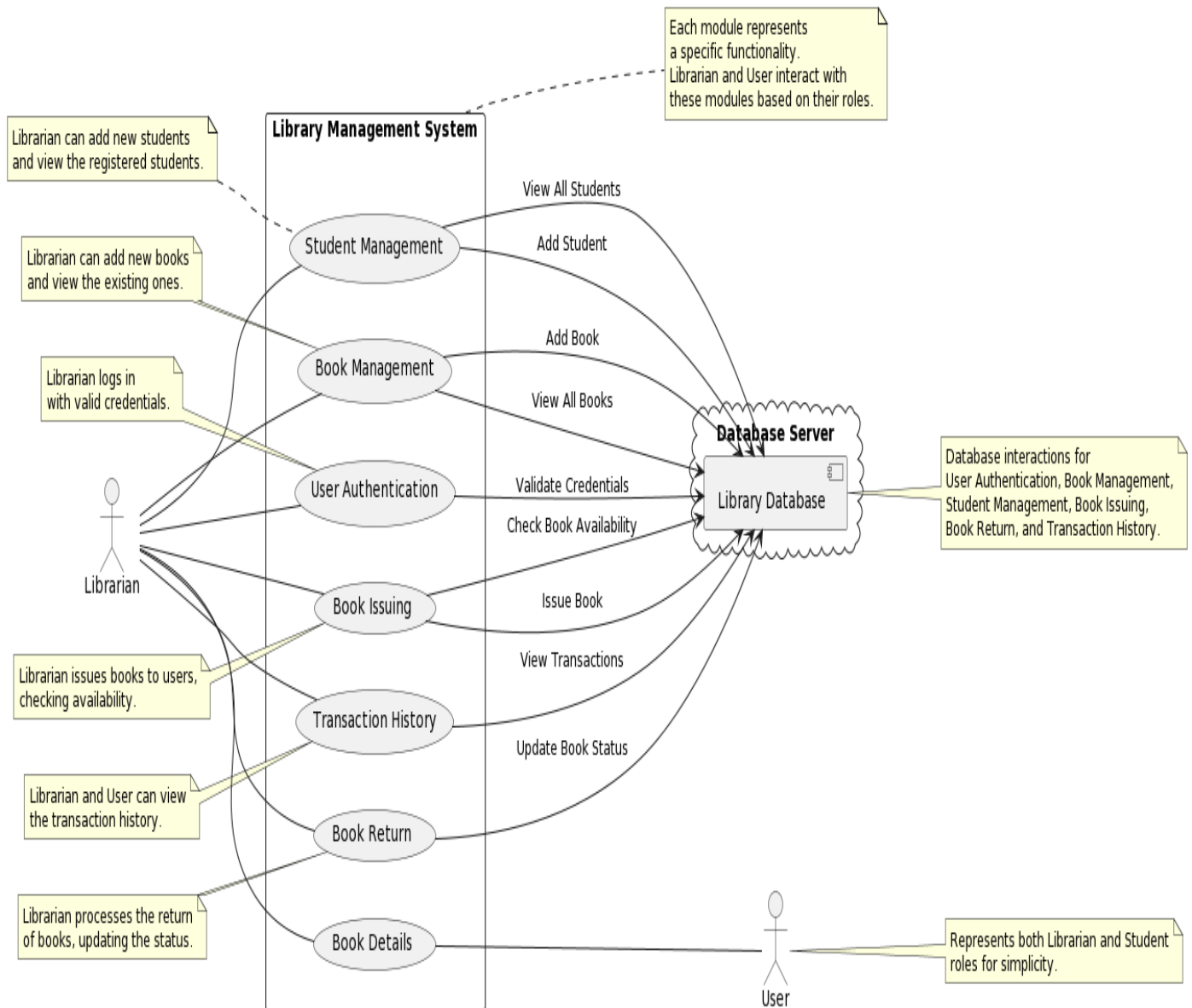
7. Compatibility:

- The application should be compatible with various devices and browsers commonly used by librarians.

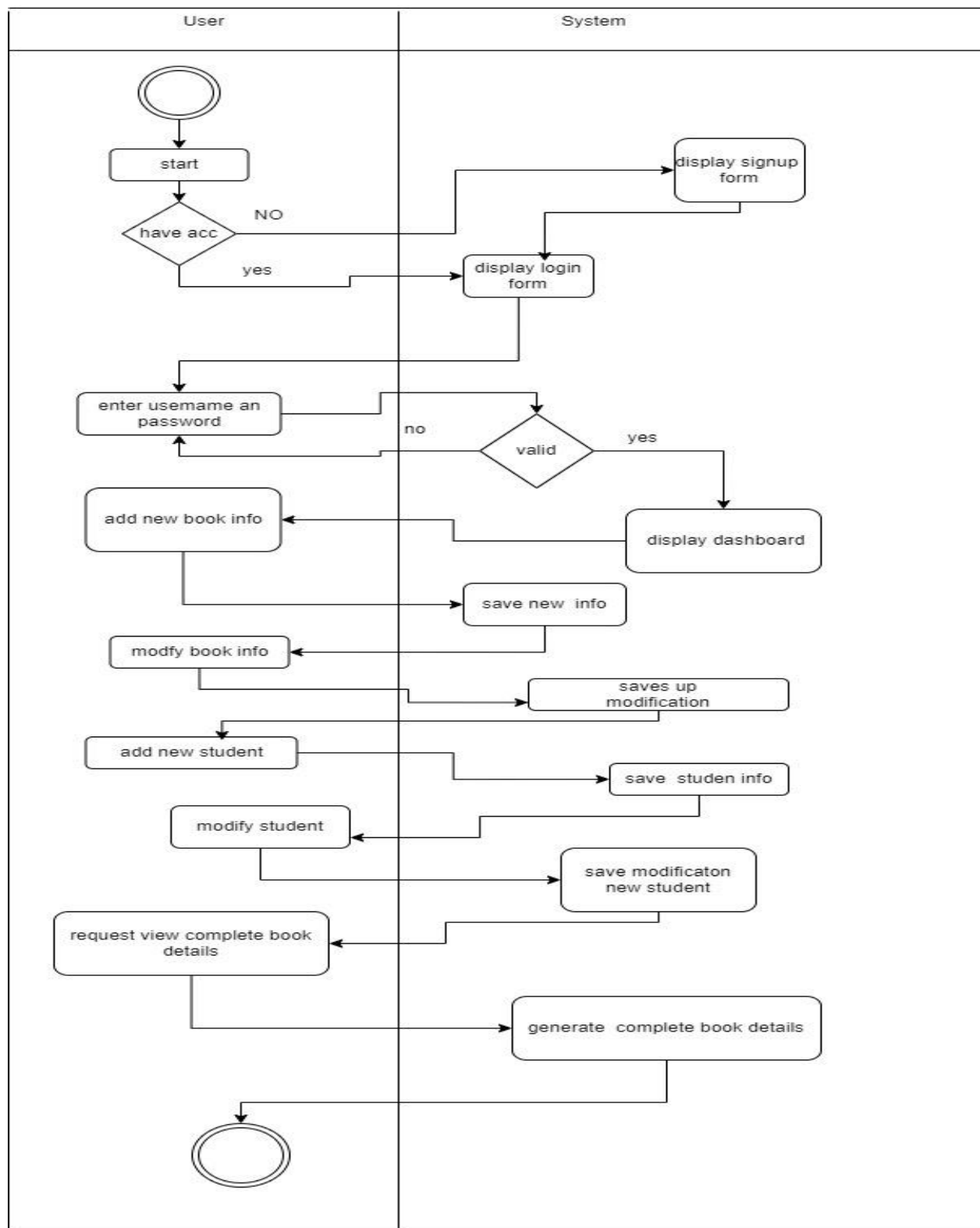
8. Reporting:

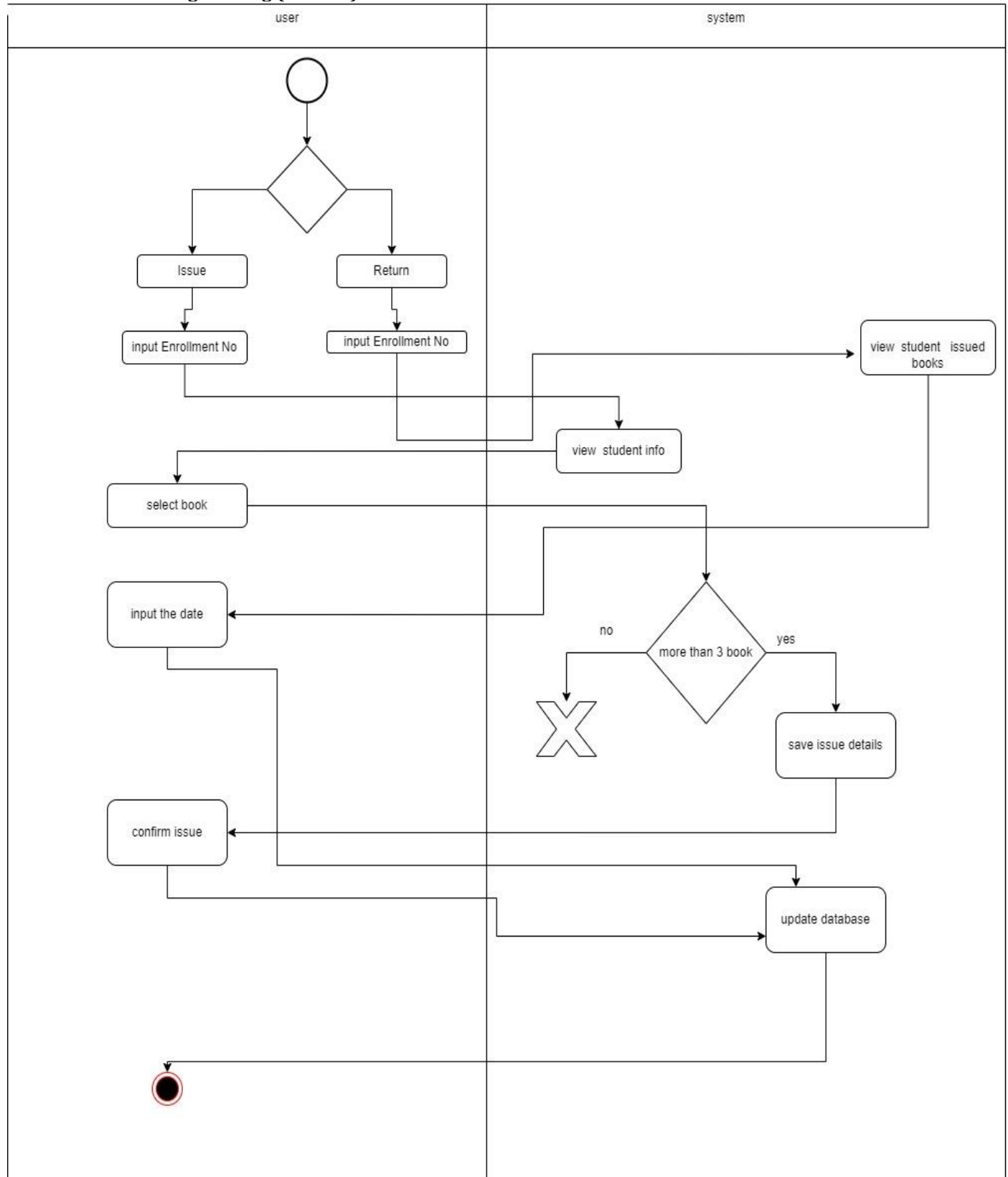
- The system should have reporting capabilities, allowing librarians to generate reports on book availability, overdue books, and other relevant statistics
-

Use case Diagram:



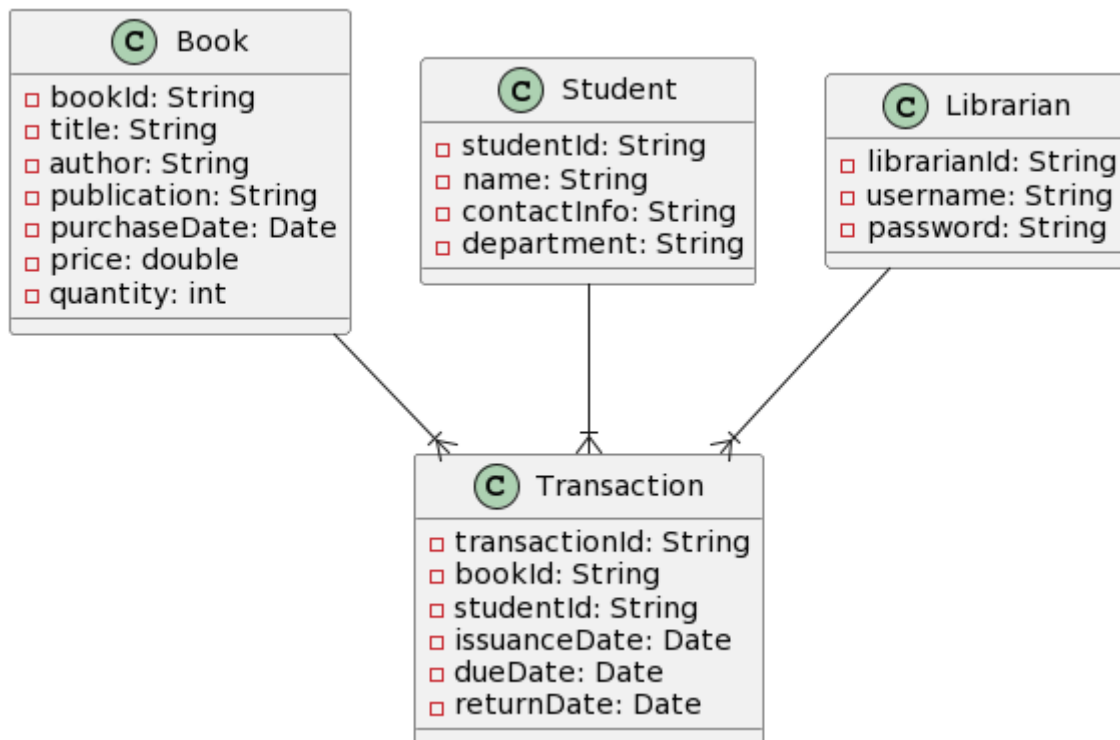
Activity Diagram:





Database Specification (ERD, Tables)

Erd:



Tables:

DESKTOP-HOB8HCV\...-dbo.logzinTable			
	id	username	pass
	1	youssef	pass
	2	abod	2003
▶	4	hazeem	2003
	5	Rowan	2004
*	NULL	NULL	NULL

DESKTOP-HOB8HCV\...- dbo.NewStudent DESKTOP-HOB8HCV\...- dbo.Newboook DESKTOP-HOB8HCV\...-dbo.logzinTable							
	stuid	sname	enroll	dep	sem	contact	email
...	1	Rowan	320220158	csit	three	5464654867	rowan@vvc.co
	4	hazem	320220151	csit	3rd	232138	hazem.ejust...
	5	youssef	320220133	csit	3rd	12564665	cc@eg.com
	6	Abdelrahman	320220137	csit	3rd	455646854	ll@ef.com
	7	ahmed	18010100	foe	9th	568486	ahm@ej.com
*	NULL	NULL	NULL	NULL	NULL	NULL	NULL

DESKTOP-HOB8HCV...- dbo.Newboook							
DESKTOP-HOB8HCV...dbo.logzinTable							
	bid	bName	bAuthor	bPubl	bPDate	bPrice	bQuan
▶	1	Programmi...	menna	Ejust	6 January, 2...	332	2
	2	software	salma	Ejust	6 January, 2...	332	2
	3	maths	jack	Ejust	6 January, 2...	3343	5
	4	data struct	willam	Ejust	14 Septemb...	5656	2
	7	phys	mohamed	Ejust	6 January, 2...	6	8
	10	chem	ahmed	asdfaf	6 January, 2...	432	5
	12	samiir	samir	ejusrt	7 January, 2...	69	2
	13	safety	mohamed	kkk	9 January, 2...	1354	2
	14	Steel	Khaled	Foe	9 January, 2...	1250	6
*	NULL	NULL	NULL	NULL	NULL	NULL	NULL

```

create table IRBook(
id int NOT NULL IDENTITY(1,1) primary key,
std_enroll varchar(250) not null,
std_name varchar(250) not null,
std_dep varchar(250) not null,
std_sem varchar(250) not null,
std_contact bigint not null,
std_email varchar(250) not null,
book_name varchar(1250) not null,
book_issue_date varchar(250) not null,
book_return_date varchar(250),
)

```

Results Messages									
id	std_enroll	std_name	std_dep	std_sem	std_contact	std_email	book_name	book_issue_date	book_return_date
1	320220151	hazem	csit	3rd	232138	hazem.ejust@ejust.com	data struct	9 January, 2024	NULL

DESKTOP-HOB8HCV...yDB - dbo.IRBook										
DESKTOP-HOB8HCV...- dbo.NewStudent										
DESKTOP-HOB8HCV...- dbo.Newboook										
	id	std_enroll	std_name	std_dep	std_sem	std_contact	std_email	book_name	book_issue...	book_retur...
▶	1	320220151	hazem	csit	3rd	232138	hazem.ejust...	data struct	9 January, 2...	10 January, ...
	2	jdsak	mohsen	csit	three	5464654867	salma@vvc...	daddasdad...	9 January, 2...	9 January, 2...
	3	320220133	youssef	csit	3rd	12564665	cc@eg.com	data struct	9 January, 2...	NULL
	4	18010100	ahmed	foe	9th	568486	ahm@ej.com	Steel	9 January, 2...	17 January, ...
	5	320220133	youssef	csit	3rd	12564665	cc@eg.com	dasdasdas	9 January, 2...	NULL
	6	320220133	youssef	csit	3rd	12564665	cc@eg.com	hfgvbc	9 January, 2...	NULL
	7	18010100	ahmed	foe	9th	568486	ahm@ej.com	data struct	9 January, 2...	17 January, ...
*	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL

System Architecture

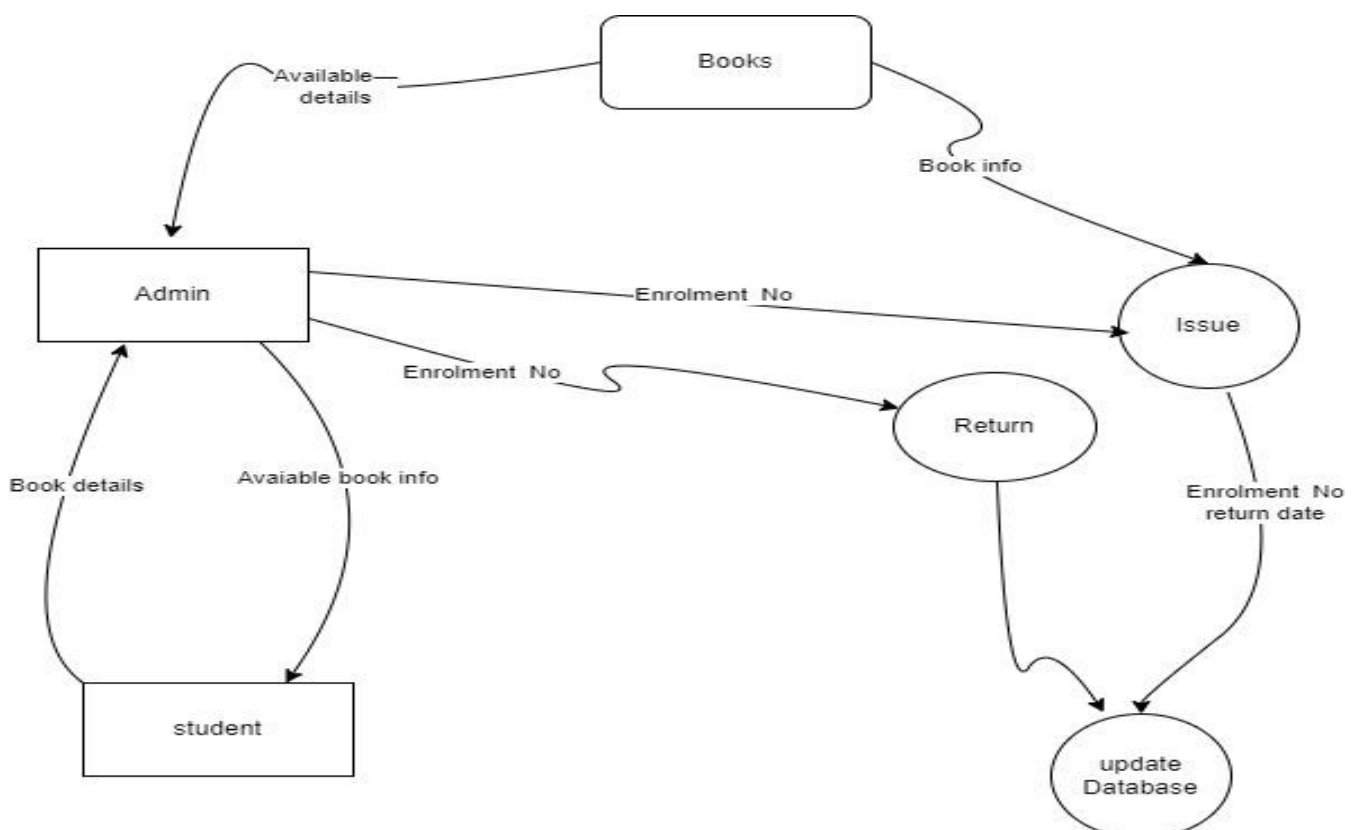
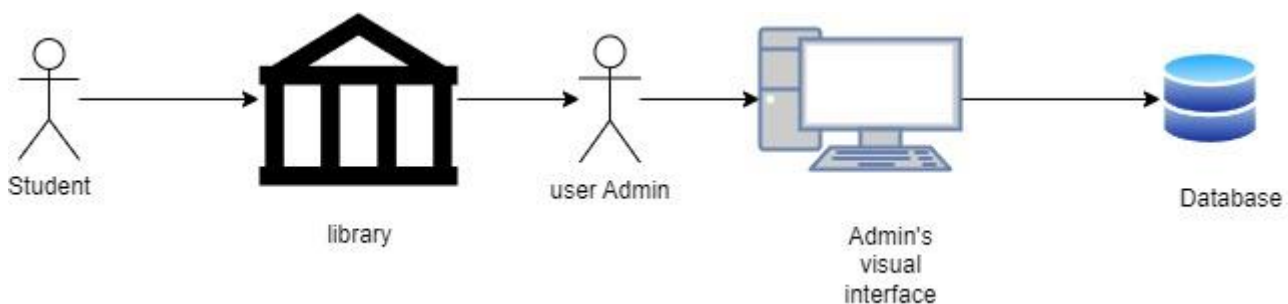
This layer will have different interfaces for each user type.

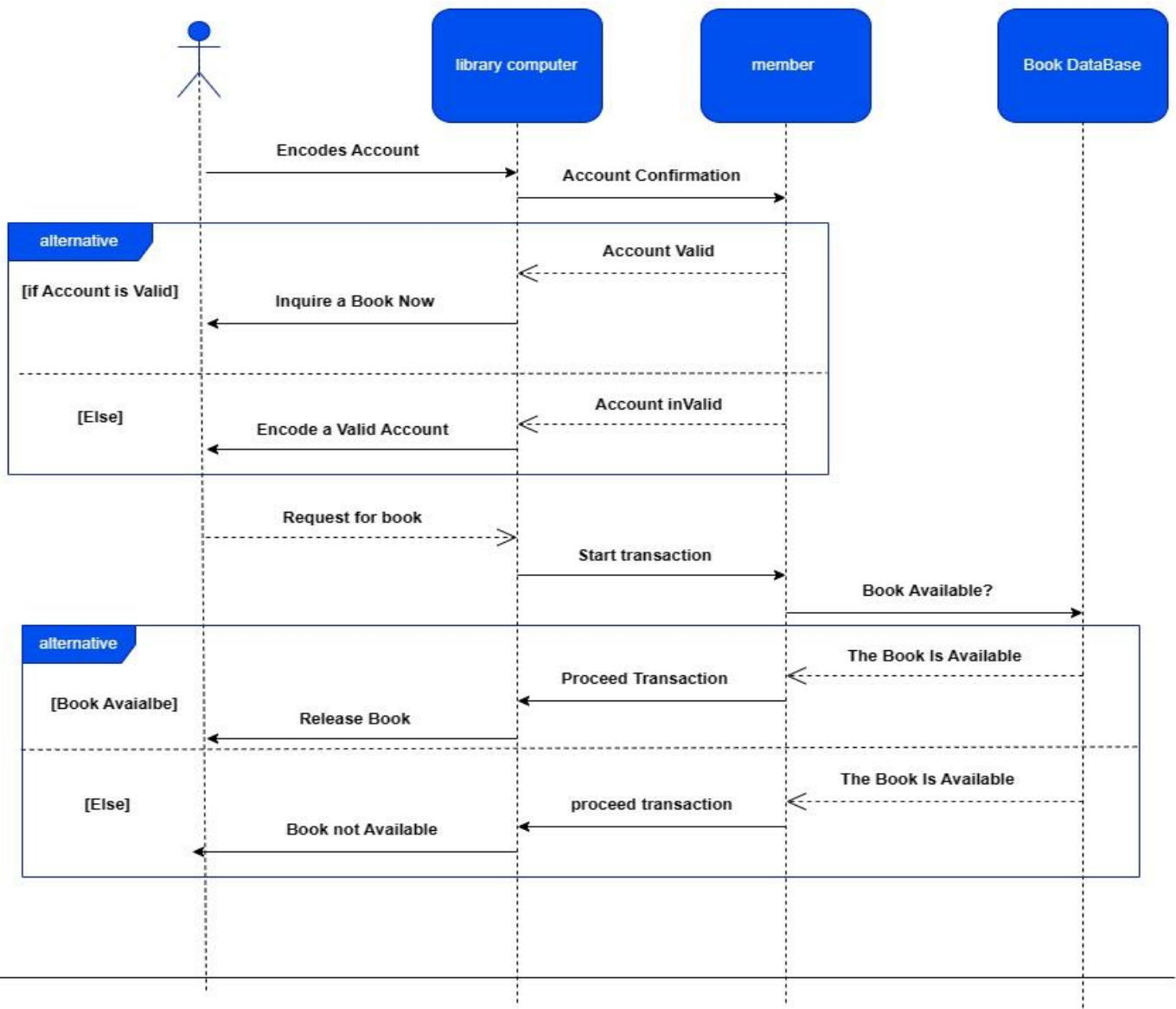
Librarian Interface: Allows librarians to log in, manage books, manage students, issue and return books, and view transaction history.

Student Interface: Enables students to log in, view available books, check their issued books, and return books.

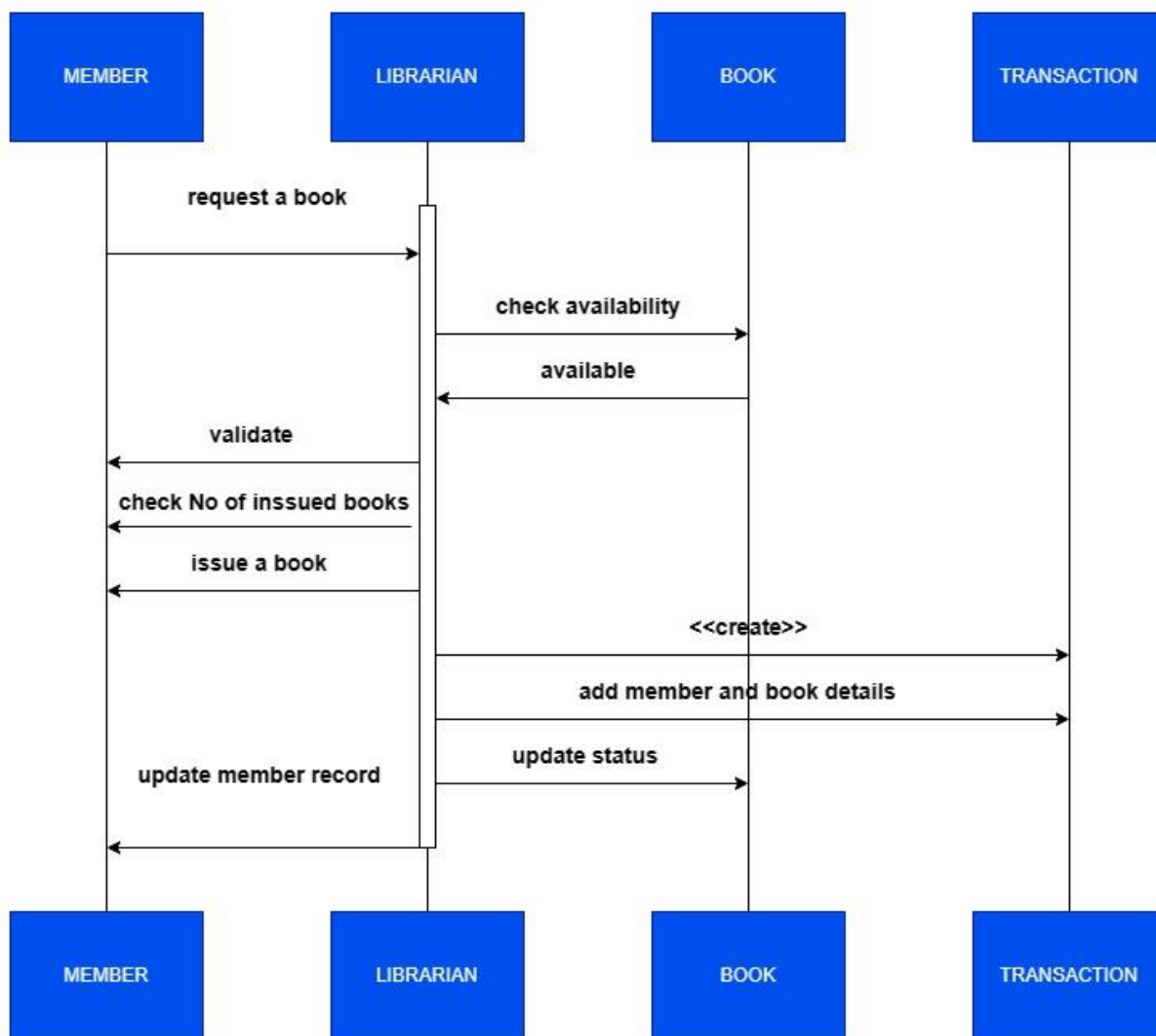
Library User Interface: Provides library users with restricted access to search and view available books.

Admin Interface: Allows admin admins to manage librarian accounts and perform system-wide configurations

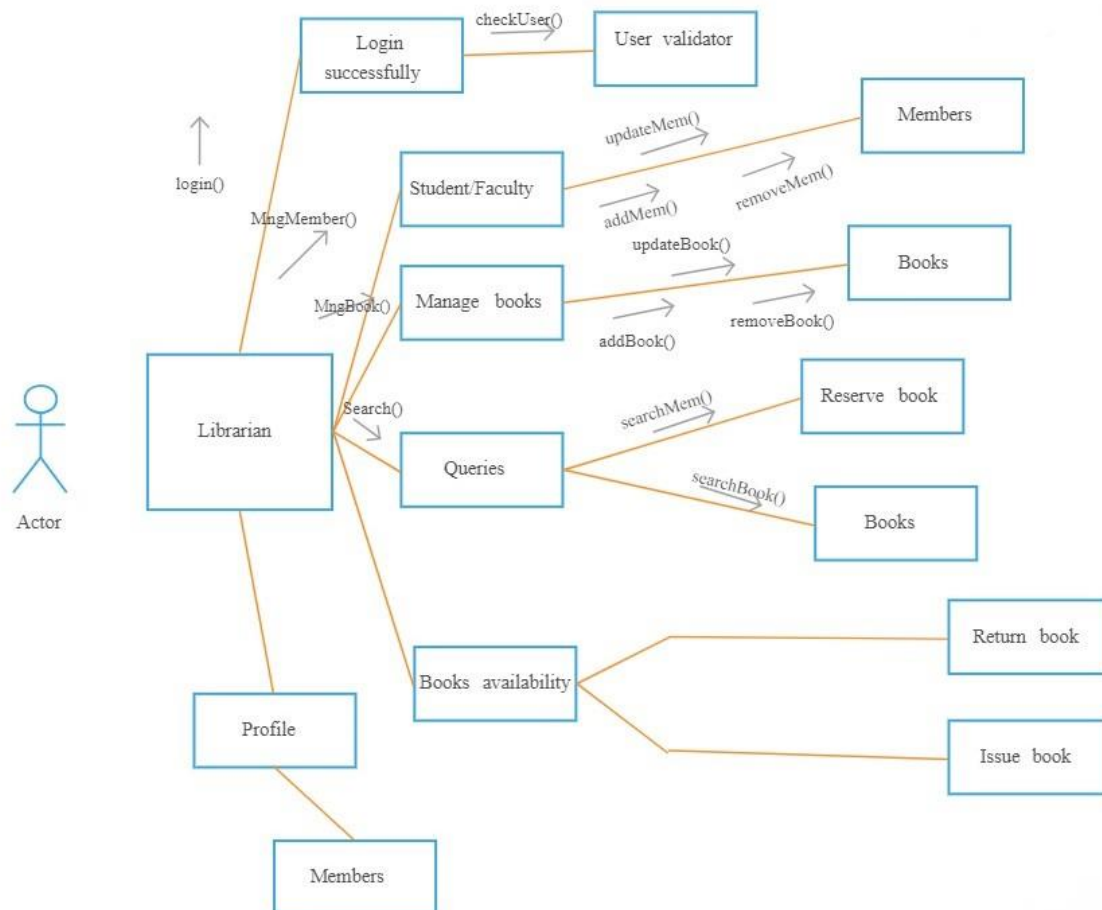


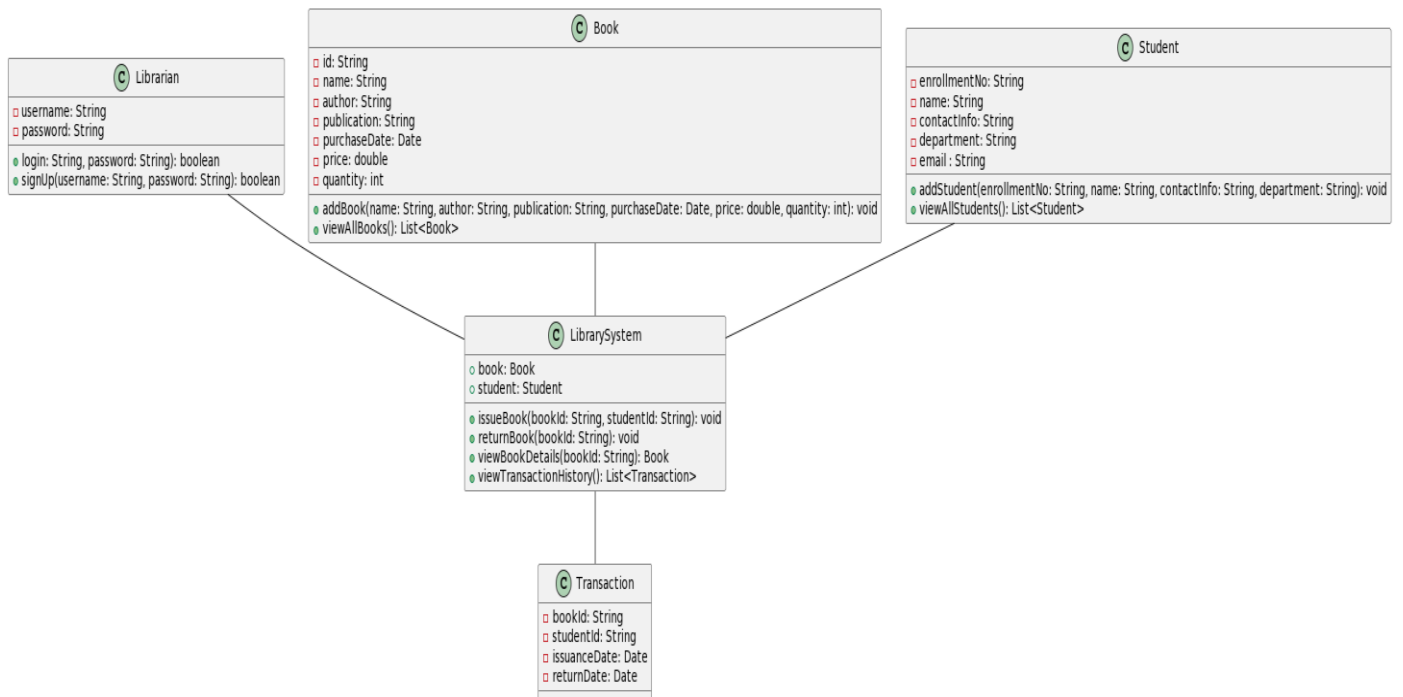


System Sequence Diagram(s)

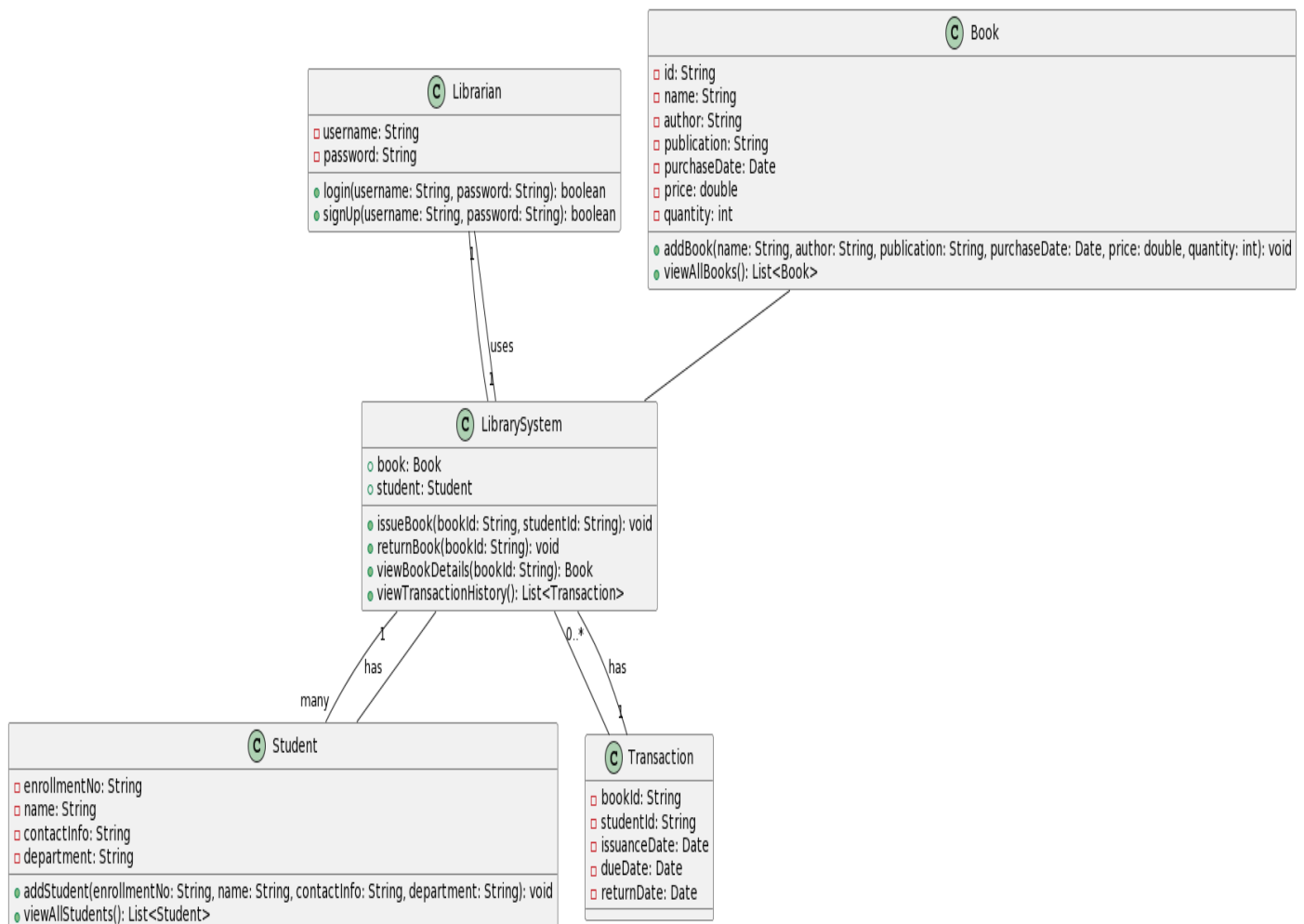


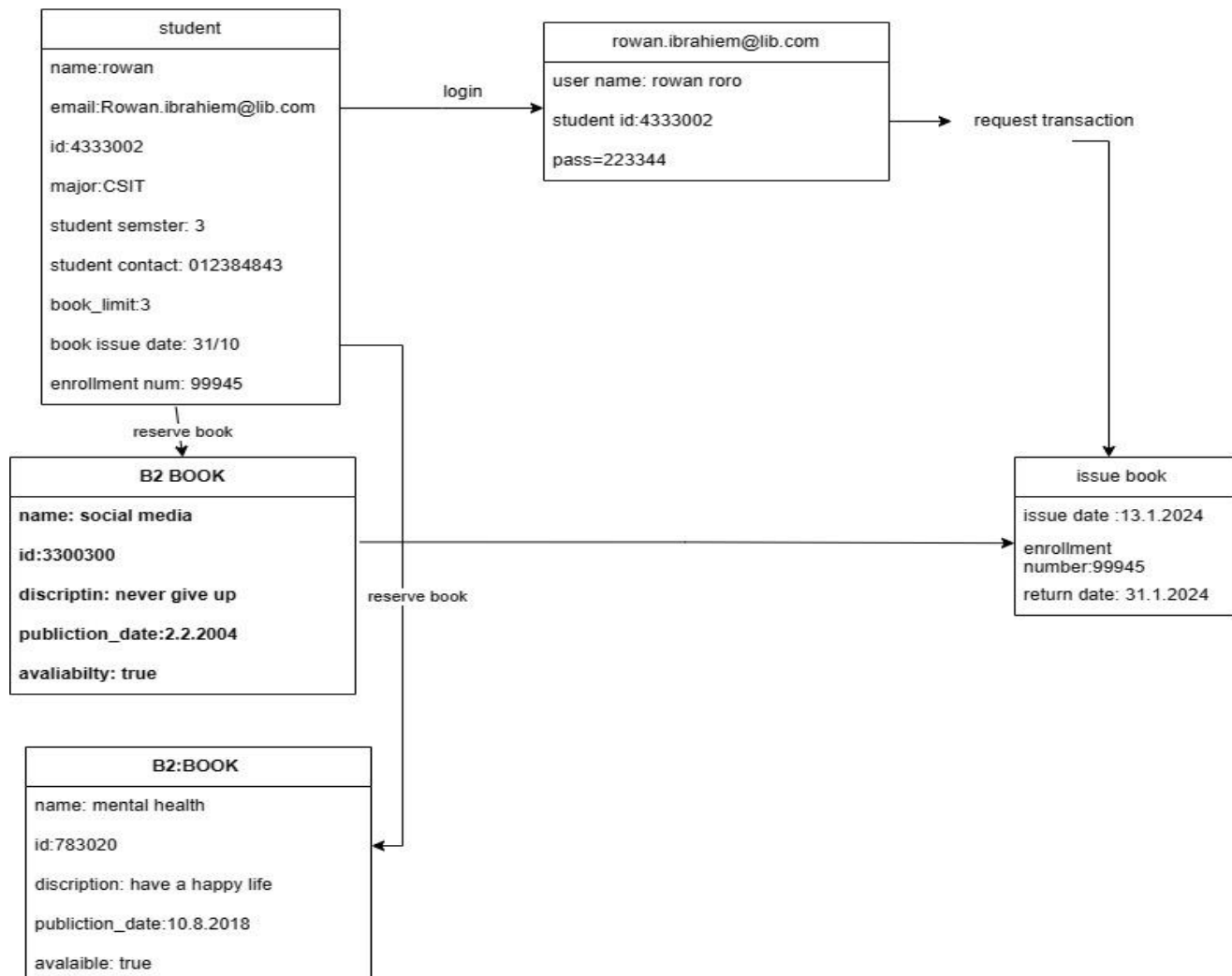
Collaboration/Communication Diagram(s)

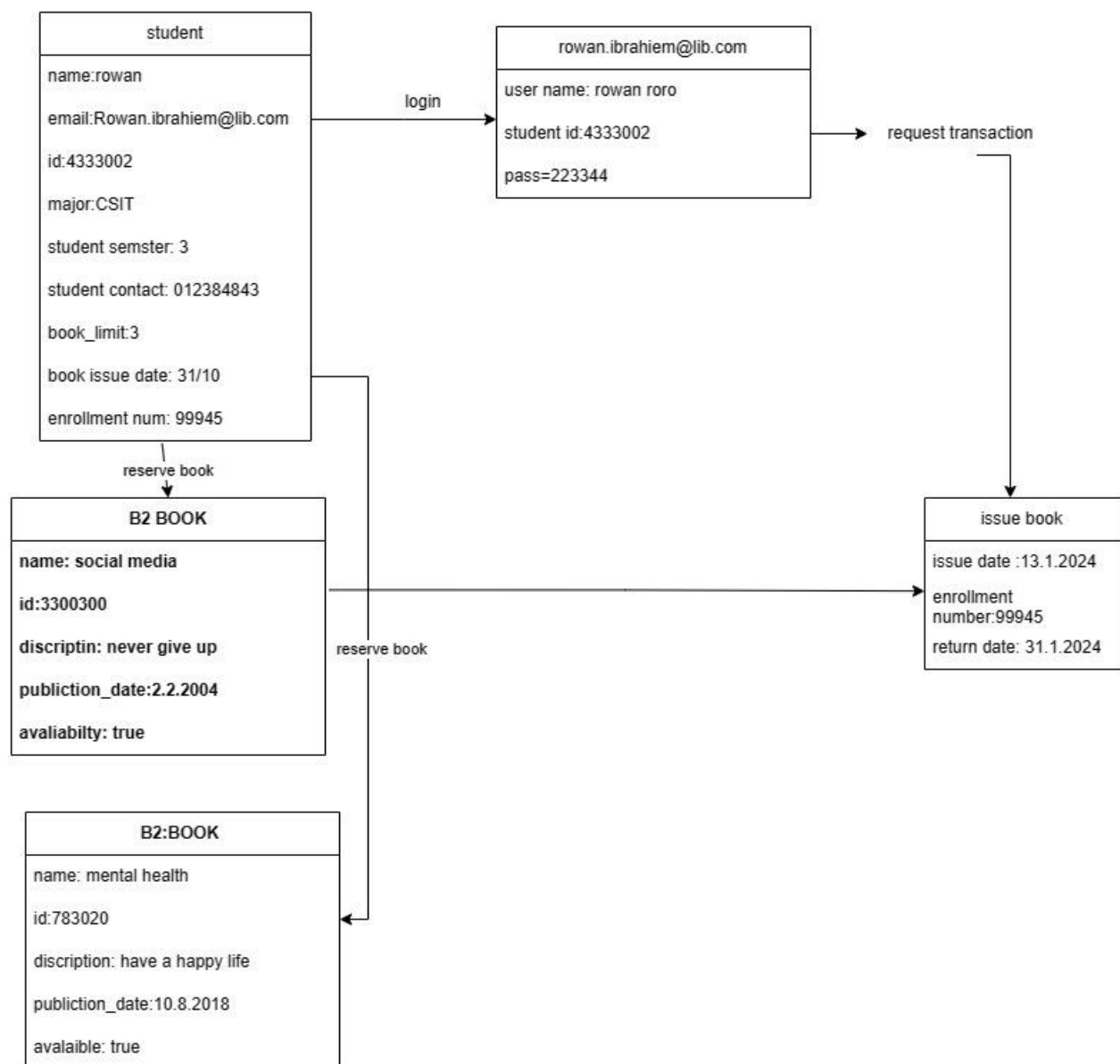


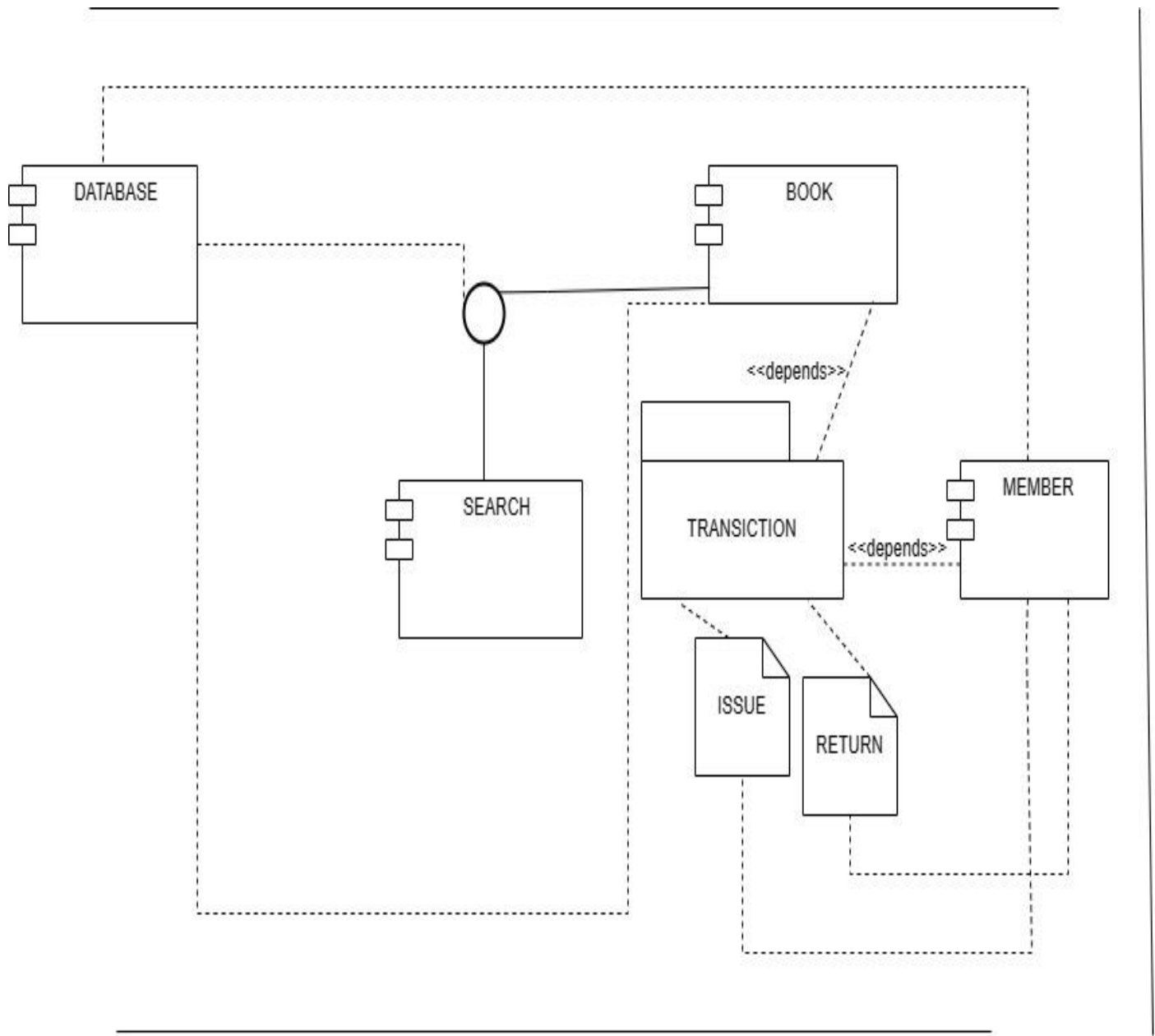


(intermediate):

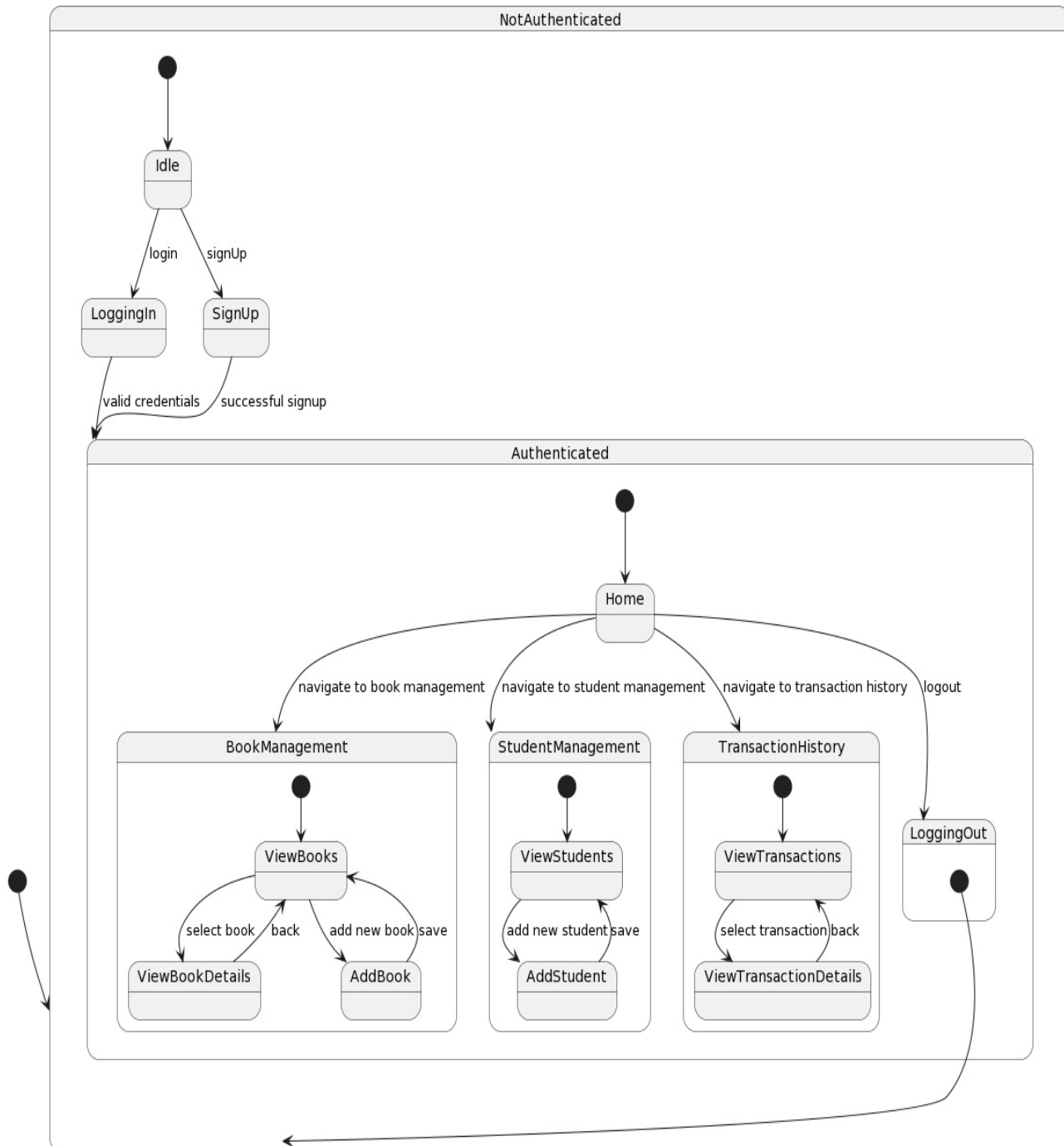




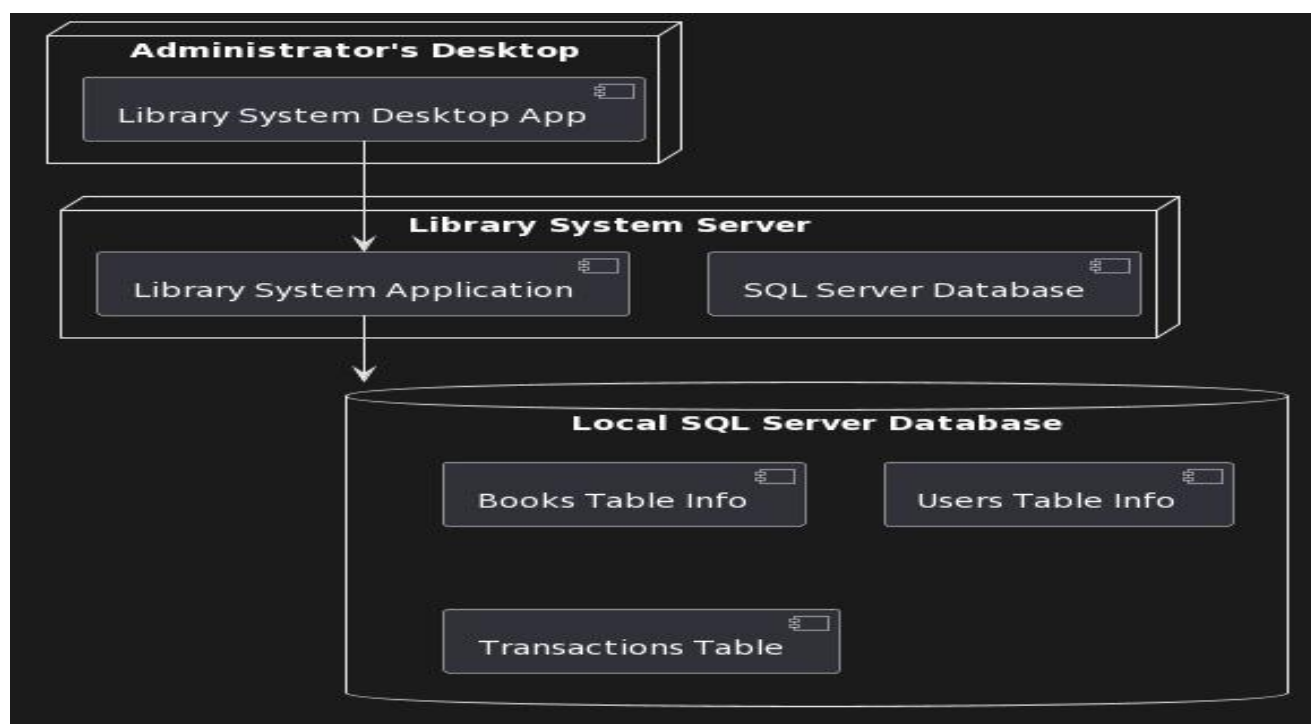




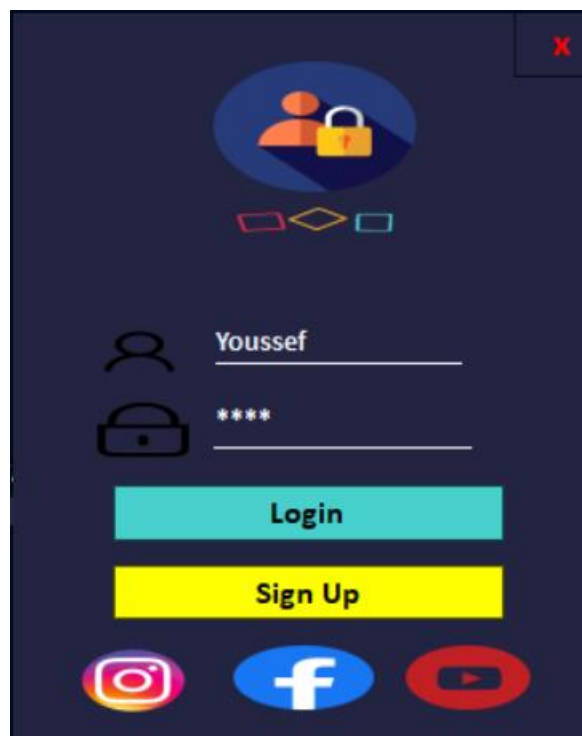
Self-Study Component 1: State-Machine Diagrams (for selected state-dependent objects)



Self-Study Component 2: Deployment diagram(s)



System SnapShots:





dashboard

books Student Issue Books Return Books Complete Book Details Exit



Addbooks

 **Add Book**



Book Name

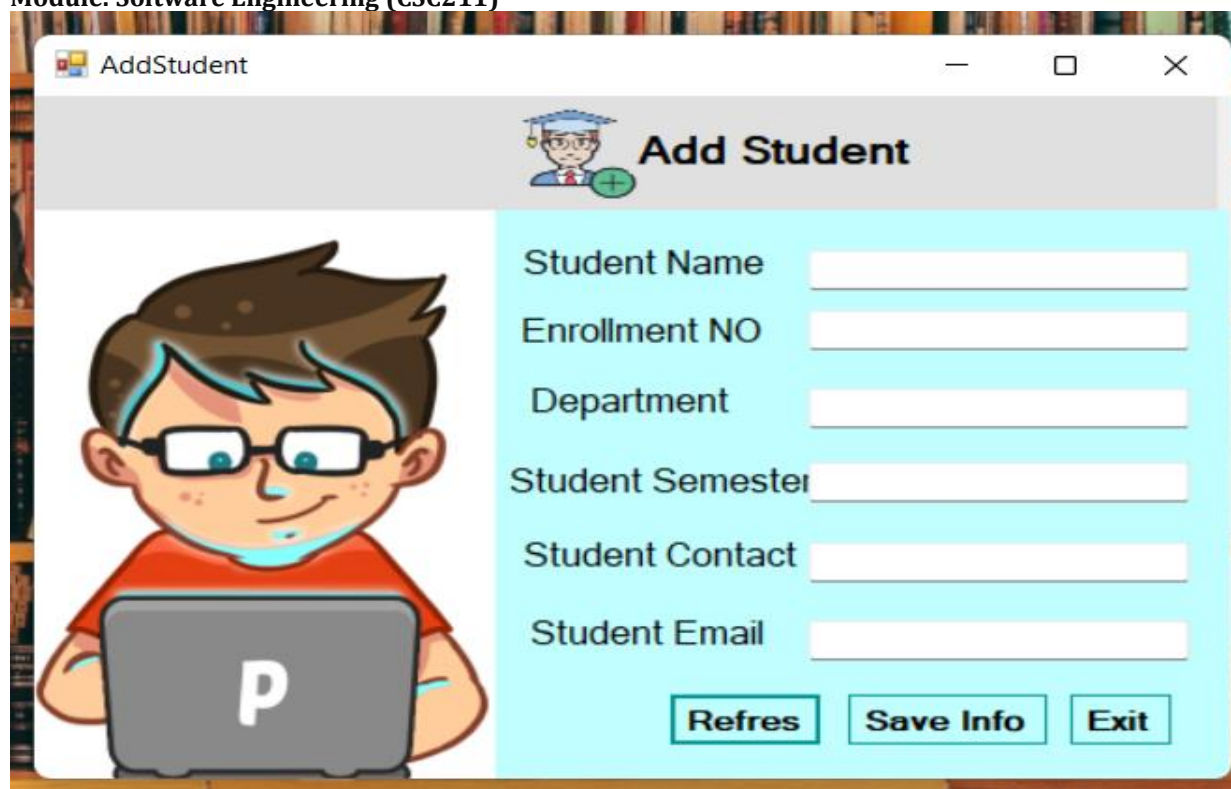
Author Name

Book Publication

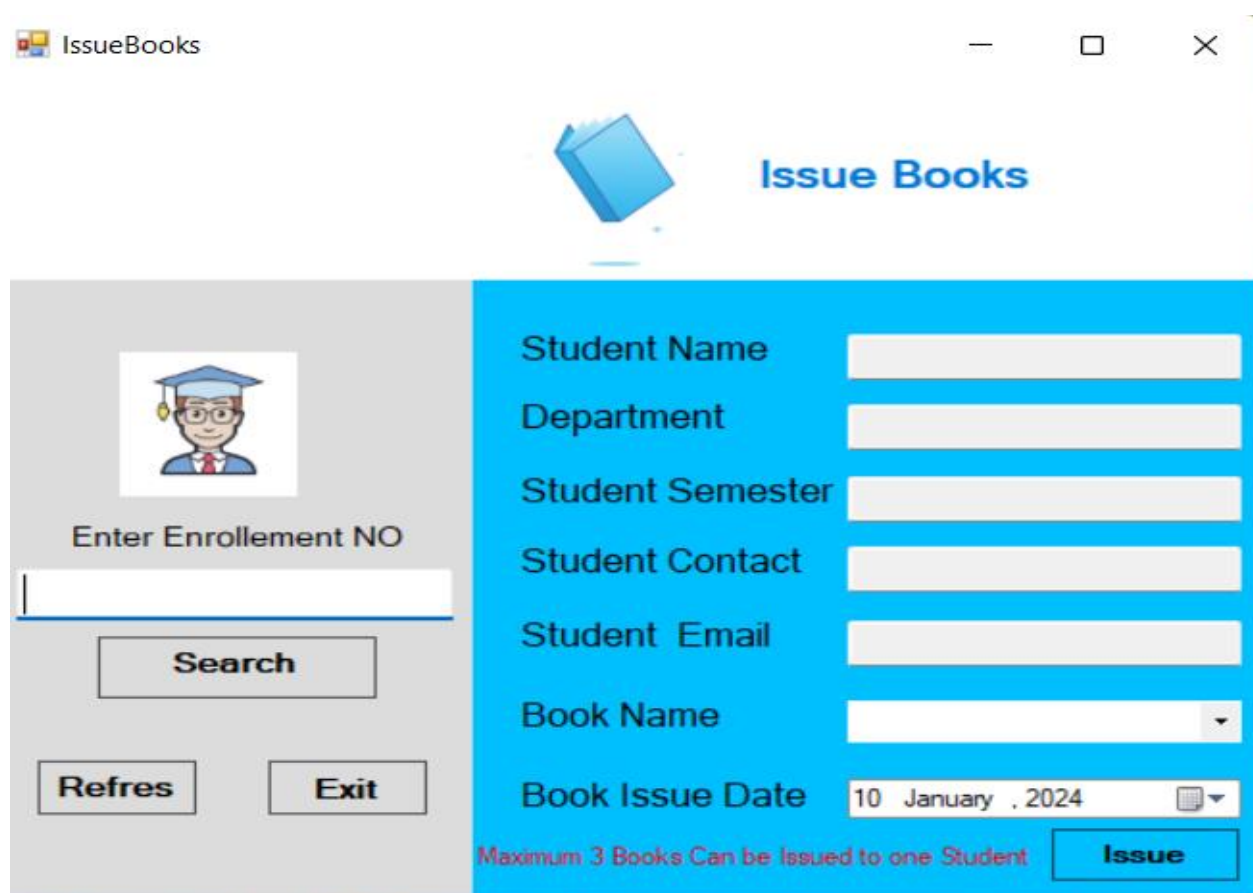
Book Purchase Date

Book Price

Book Quantity



The 'AddStudent' window features a title bar with standard Windows controls. The main area has a light blue background. On the left, there is a cartoon illustration of a student with brown hair and glasses, wearing a red shirt, sitting at a desk with a laptop that has a white 'P' on it. To the right of the illustration, the text 'Add Student' is displayed in a large, bold, black font. Below this, there are six input fields stacked vertically, each with a corresponding label: 'Student Name', 'Enrollment NO', 'Department', 'Student Semester', 'Student Contact', and 'Student Email'. At the bottom right of the form area, there are three buttons: 'Refres', 'Save Info', and 'Exit'.



The 'IssueBooks' window has a title bar with standard Windows controls. The main area has a light blue background. At the top center, there is a blue book icon and the text 'Issue Books' in a large, bold, blue font. Below this, the window is divided into two main sections. The left section has a light gray background and contains a small icon of a student with a graduation cap, the text 'Enter Enrollement NO', a text input field, a 'Search' button, and 'Refres' and 'Exit' buttons at the bottom. The right section has a light blue background and contains six input fields stacked vertically, each with a corresponding label: 'Student Name', 'Department', 'Student Semester', 'Student Contact', 'Student Email', and 'Book Name'. Below these fields is a 'Book Issue Date' field with a date picker showing '10 January , 2024'. At the bottom of the right section, there is a red text message: 'Maximum 3 Books Can be Issued to one Student' and an 'Issue' button.