

Veer Narmad South Gujarat University, Surat.

**Department of Information and
Communication Technology**

M.Sc. (Information Technology) Programme

Project Report

9th Semester

**M.Sc. (Information Technology)
5 Year Integrated Course**

Year 2023 – 2024

Knowledge Gate – Library Management System

Guided By :

**Dr. Devendra Pandey (Internal
Guide)**

Submitted By :

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Veer Narmad South Gujarat University, Surat.

Department of Information and Communication Technology

M.Sc. (Information Technology) Programme

Certificate

This is to certify that Ms. **Charmi Yogeshkumar Modi** with Exam Seat Number: **24** and PG Registration Number: **E19110018000610066** has worked on her project work entitled **Knowledge Gate** at **Department of ICT** as a partial fulfillment of the requirements for **9th Semester - M.Sc. (Information Technology) [5 Year Integrated course]**, during the academic Year 2023-2024.

Date : 18/12/2023

Place : Dept. of ICT, VNSGU, Surat.

**Internal Project Guide
M.Sc.(I.T.) 9th Semester
Department of I.C.T.
Veer Narmad South Gujarat University,
Surat**

**Head of the Department
Department of I.C.T.
Veer Narmad South Gujarat University,
Surat**

Veer Narmad South Gujarat University, Surat.

Department of Information and Communication Technology

M.Sc. (Information Technology) Programme

Certificate

This is to certify that Ms. **Mansi Hiteshkumar Modi** with Exam Seat Number: **26** and PG Registration Number: **E19110018000610069** has worked on her project work entitled **Knowledge Gate** at **Department of ICT** as a partial fulfillment of the requirements for **9th Semester - M.Sc. (Information Technology) [5 Year Integrated course]**, during the academic Year 2023-2024.

Date : 18/12/2023

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1.1 Customer Profile

1.1.1 Current System

Project Name	Knowledge Gate - Library Management System
Technology	Spring MVC
Other Tools	Java, Bootstrap 5, HTML & CSS, Gitlab, jQuery, JavaScript
Project Category	Web Application
Project Members	2
Internal Project Guide	Dr. Devendra Pandey
Submitted By	Ms. Charmi Modi Ms. Mansi Modi
Submitted To	Department of I.C.T, VNSGU

2. Current System

The knowledge Gate is a software that empowers knowledge sharing and makes the joy of reading accessible to everyone. Knowledge Gate is a digital heaven to manage books in the library, issued books, category of books, different roles, students, employees, admin.

The tool provides place where readers and librarians connect, knowledge flows freely.

2.1 Scope

The knowledge Gate aims to provide a platform that can improve the library experience for both users and staff. It can increase patron engagement, optimize library operations, and promote efficient resource management.

2.2 Objective

The knowledge Gate : Easy library management website for admin to get the visual data in one place, manage their staffs and permit the requested books and can see all the feedbacks from the students. staff can manage the students, issued books, books in the library, students' membership, students' penalties, the new arrivals of books, report for new book. Students track borrowings, new arrivals, penalties, and get return email alerts.

2.3 Advantages

- ✓ Reduces wastage of paper by creating an electronic record system.
- ✓ Browse vast collections from the comfort of your screen, filtering by genre, author, keywords, and even availability.
- ✓ Whether you're a seasoned bookworm or a curious newcomer, an LMS unlocks a world of possibilities within the library walls and beyond.
- ✓ Gain valuable statistics on book usage.

3. Environment Specification

3.1 Hardware & Software requirements

➤ Hardware requirements

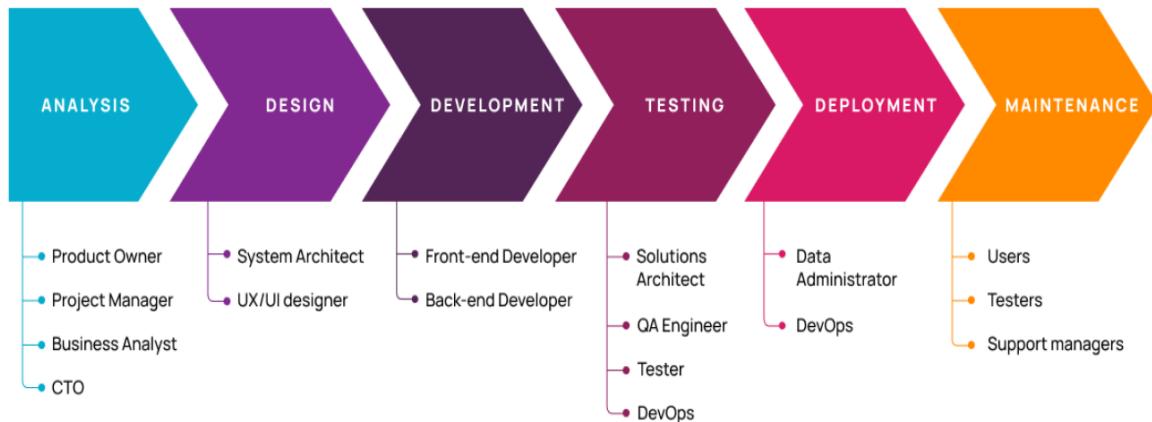
Processor	Intel platinum processor
Hard-disk	64 GB
Ram	2 GB

➤ Software requirements

Operating System	Windows 7 and up
Web Browser	Any
Software	MySQL, Any IDE that can run spring, Any Source control

3.2 Development Description

- Development is a process that creates growth, progress, positive change or the addition of physical, economic, environmental, social and demographic components.
- The purpose of development is a rise in the level and quality of life of the population, and the creation or expansion of local regional income and employment opportunities, without damaging the resources of the environment.
- Development is visible and useful, not necessarily immediately, and includes an aspect of quality change and the creation of conditions for a continuation of that change.



Software development process include following steps:

- **Planning:** Business analyst and Project organizer set up a meeting with the client to gather all the data like what the customer wants to build, who will be the end user, what is the objective of the product. Before creating a product, a core understanding or knowledge of the product is very necessary.
- **Analysis:** Once the requirement analysis is done, the next stage is to certainly represent and document the software requirements and get them accepted from the project stakeholders.
- **Design:** The next phase is about to bring down all the knowledge of requirements, analysis, and design of the software project. This phase is the product of the last two, like inputs from the customer and requirement gathering.
- **Implementation:** In this phase, the actual development begins, and the programming is built. The implementation of design begins concerning writing code. Testing and Integration: After the code is generated, it is tested against the requirements to make sure that the products are solving the needs addressed and gathered during the requirements stage.
- **Deployment:** Once the software is certified, and no bugs or errors are stated, then it is deployed.
- **Maintenance:** Once when the client starts using the developed systems, then the real issues come up and requirements to be solved from time to time

4. System Planning

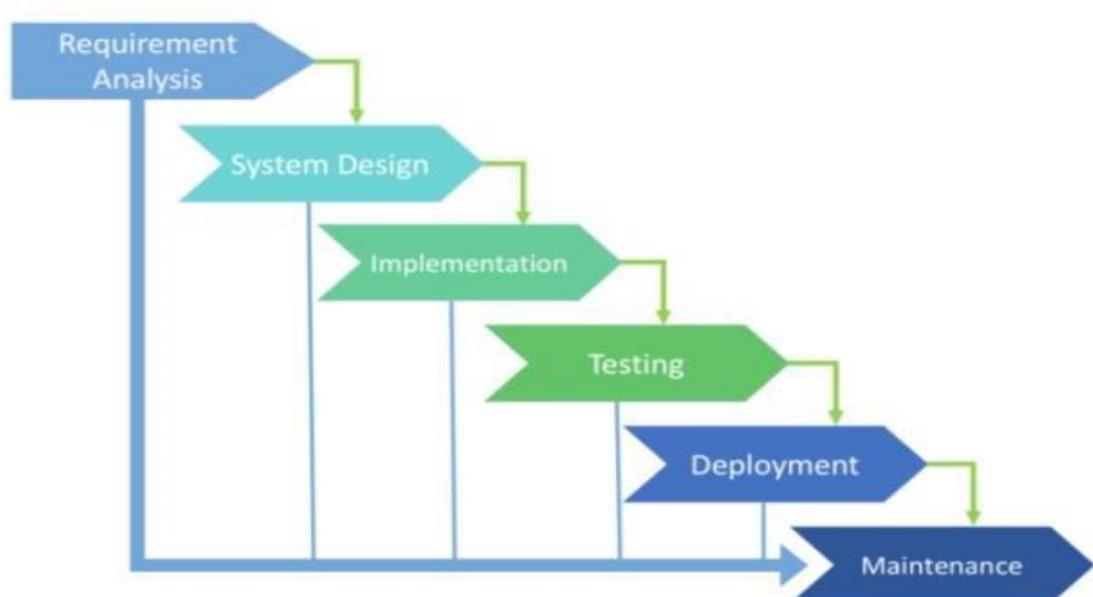
4.1 Feasibility Study

□ Technical Feasibility

- Minimum system required for admin and other user is computer connected with internet with compatible browser.
- The software and hardware to run my project and usage is given below.
- Tools/platform used is:
 - Database: SQL SERVER 2018-19
 - Platform used: Windows 10

4.2 Software Engineering Model

I have followed Iterative waterfall Model for software development do we can add new functionalities as per requirement.



5. System Analysis

5.1 Detailed SRS

≡ Functional Requirement

- **Common**

- Login
- Forgot Password
- Log Out
- Register

- **Admin**

- Dashboard
- Most frequently issued books
- Most frequently requested book to purchase
- Recently arrived new books
- Permit the book purchase
- Manage Roles of user
- Manage Category of book

- **Employee**

- Can issue books to students
- Manage penalty
- Manage the membership
- Report if any book is lost
- Manage new members in library
- Manage new arrived book
- Manage Students

- **Student**

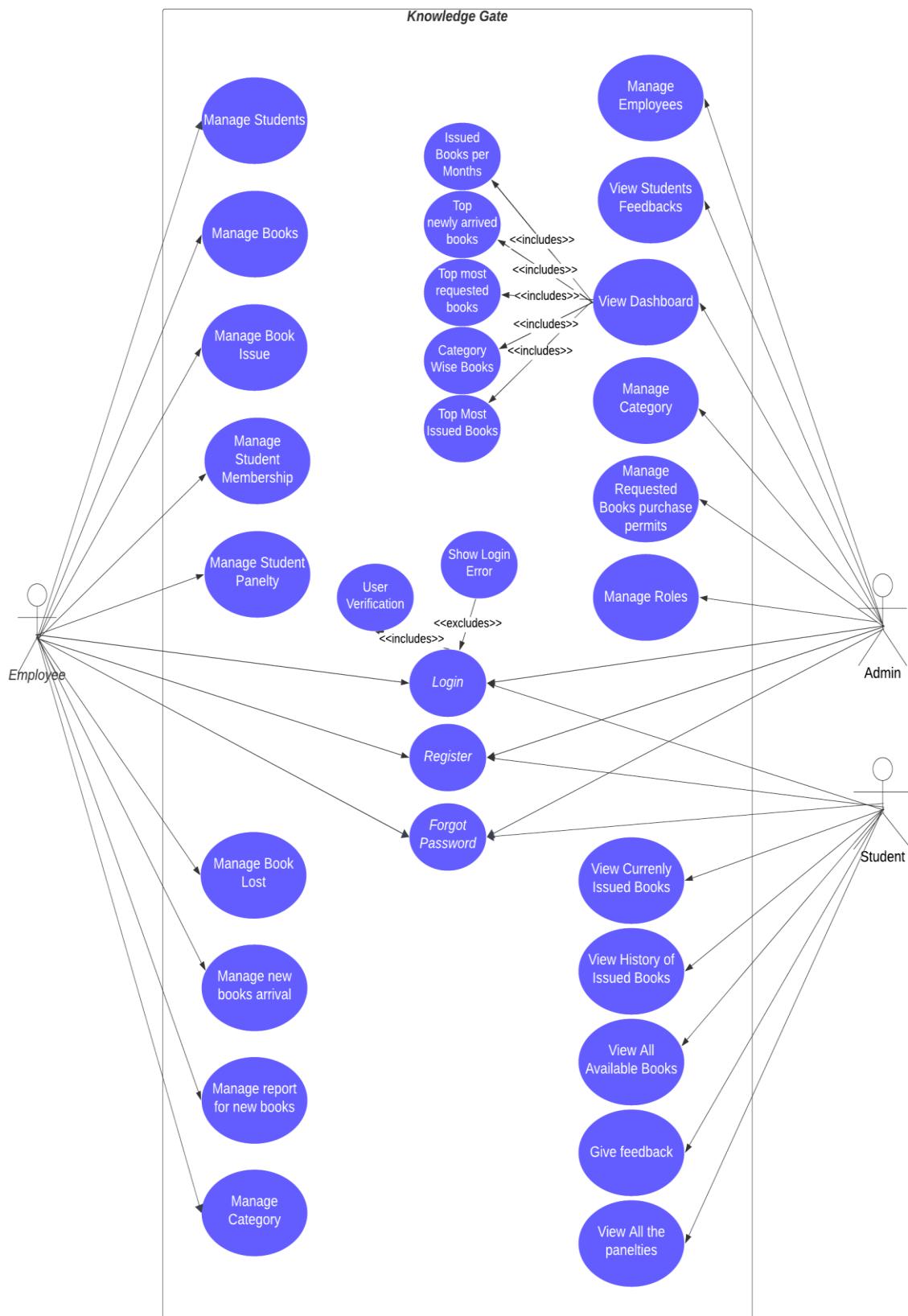
- Currently Issued books
- History of issued books
- Request for a new book
- Check if the book needed is available
- Feedback for library services
- Get Penalties list

☰ Non – Functional Requirement

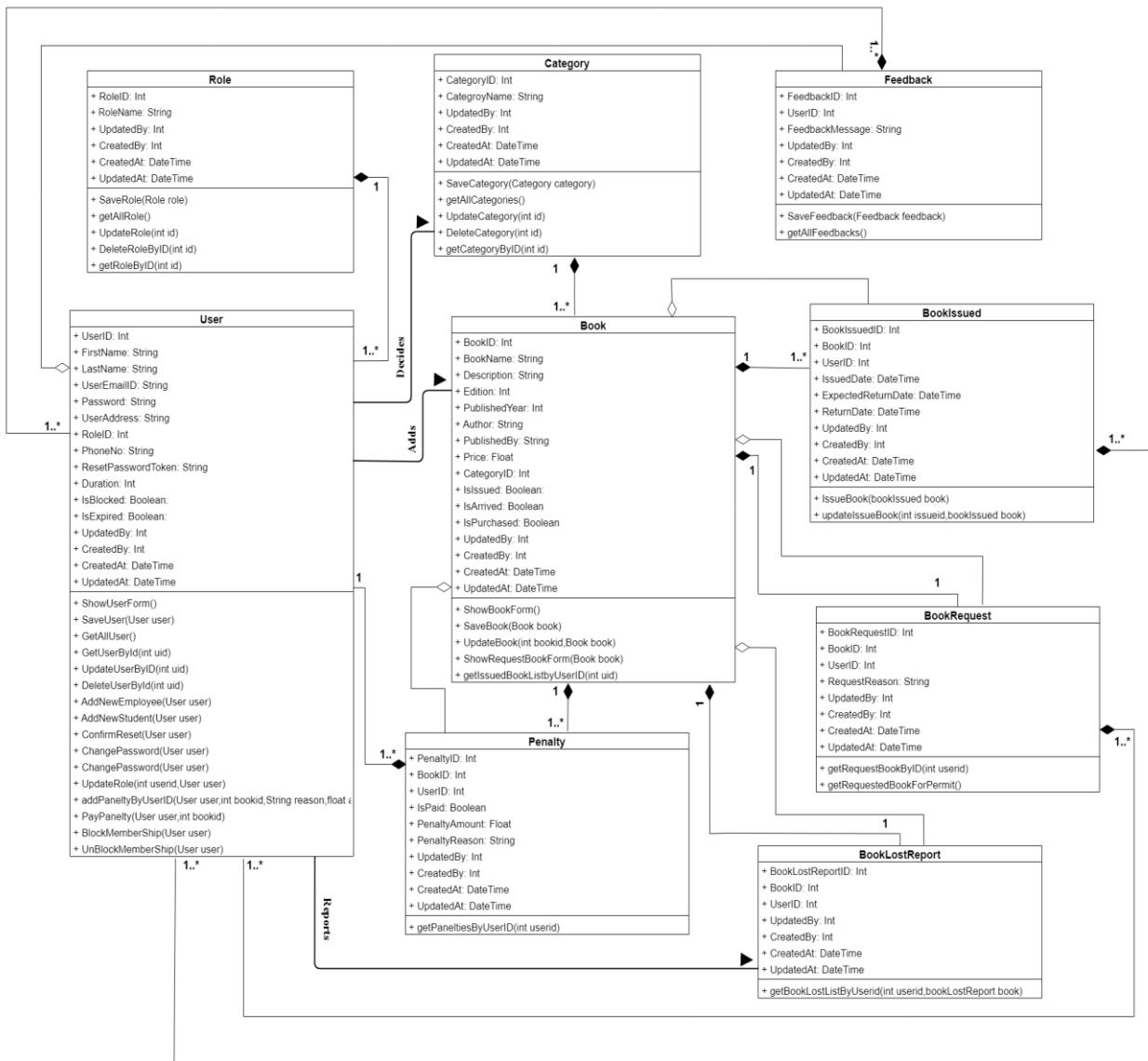
- Usability
- Security
- Performance
- Maintainability
- Availability

5.2 UML Diagrams

5.2.1 Use-Case Diagrams

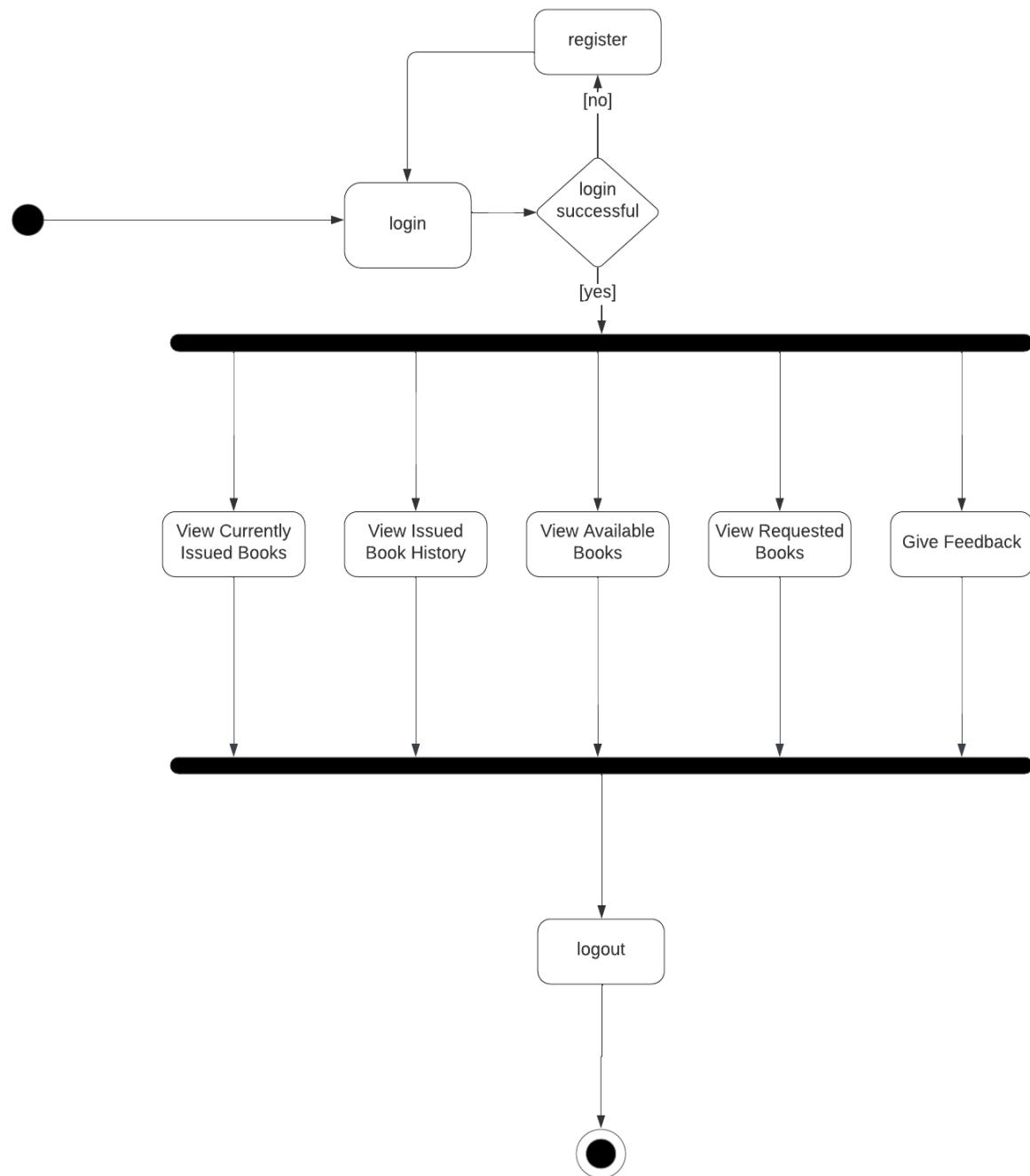


5.2.2 Class Diagram

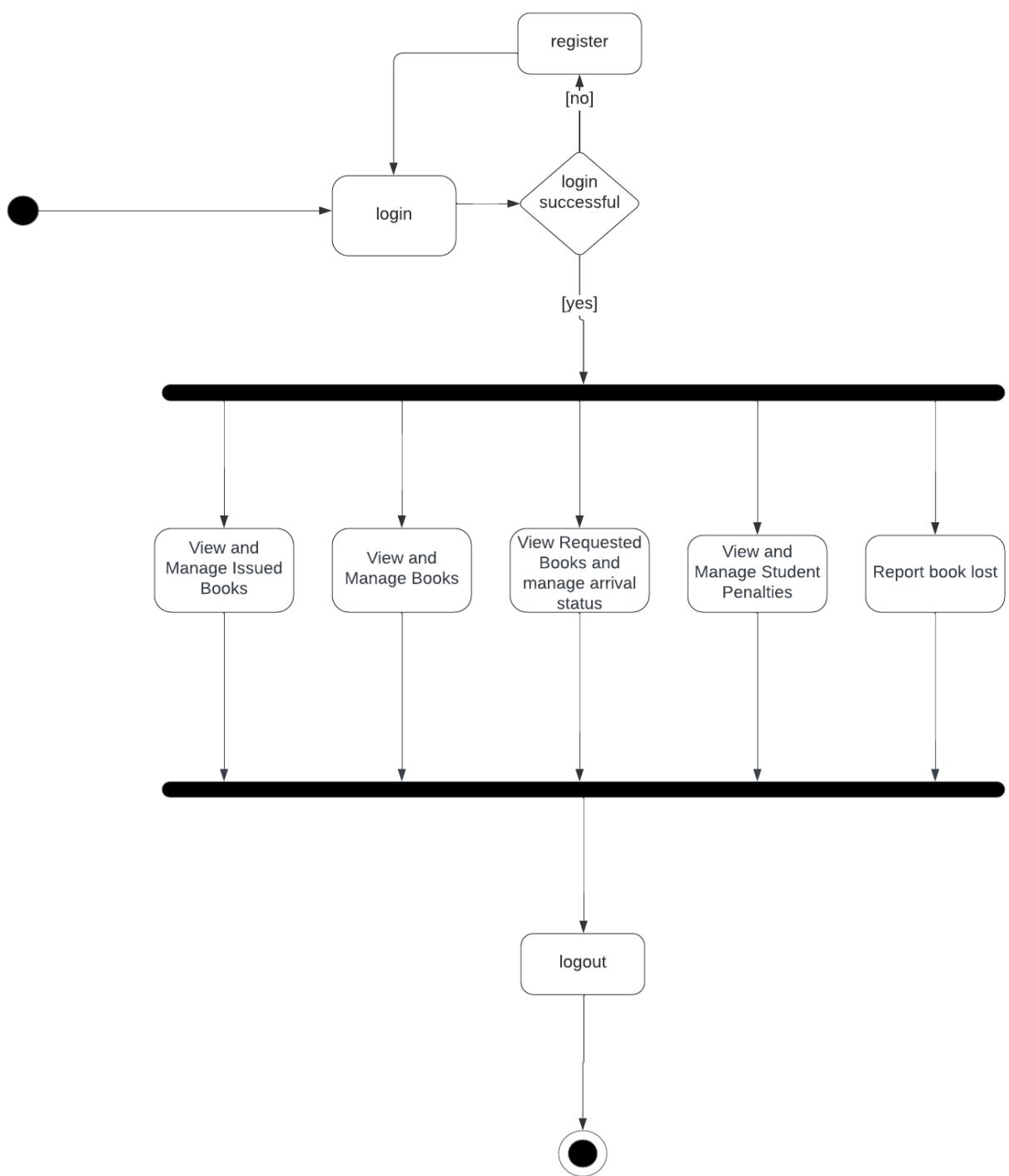


5.2.3 Activity Diagram

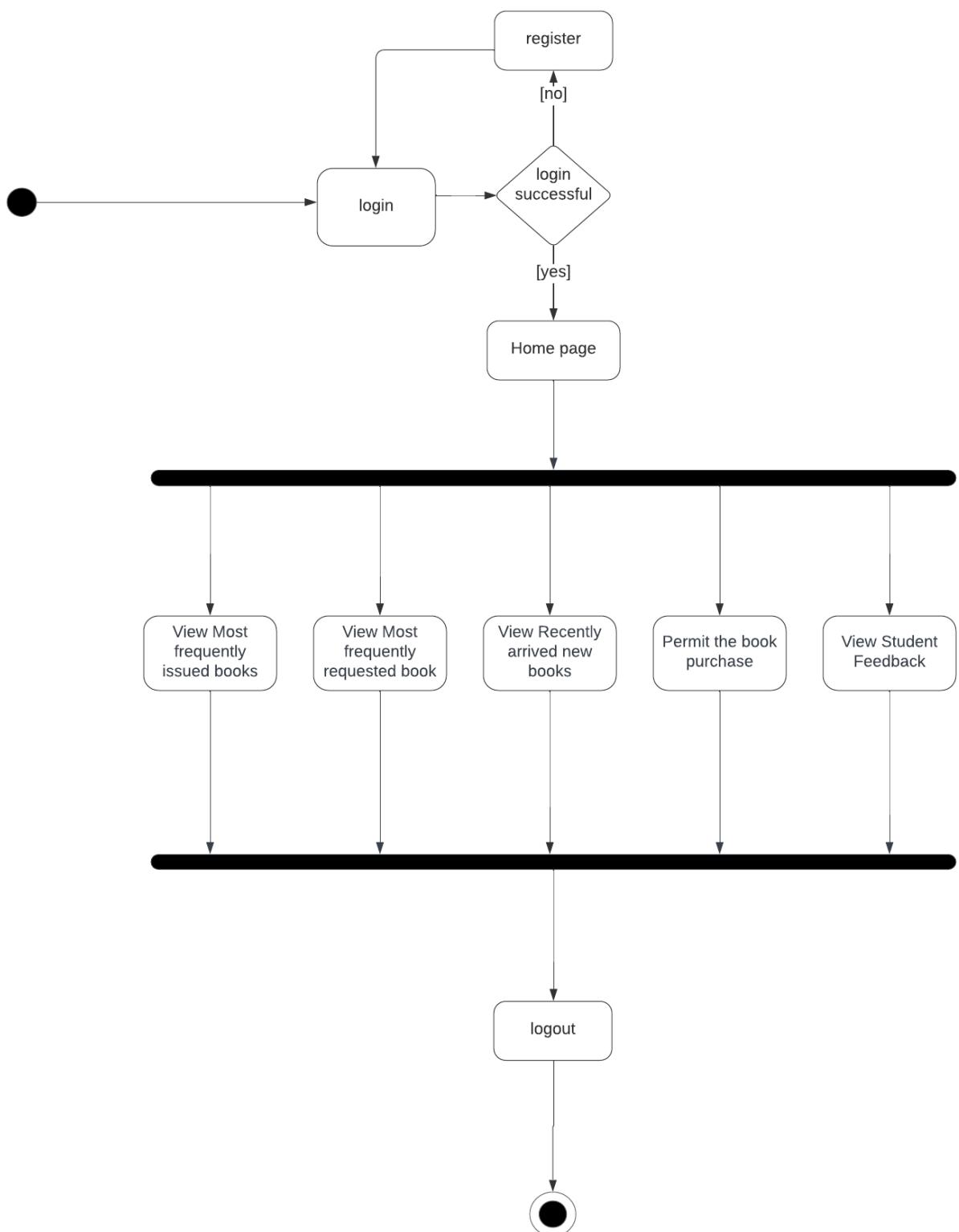
- Student Activity Diagram



- Employee Activity Diagram

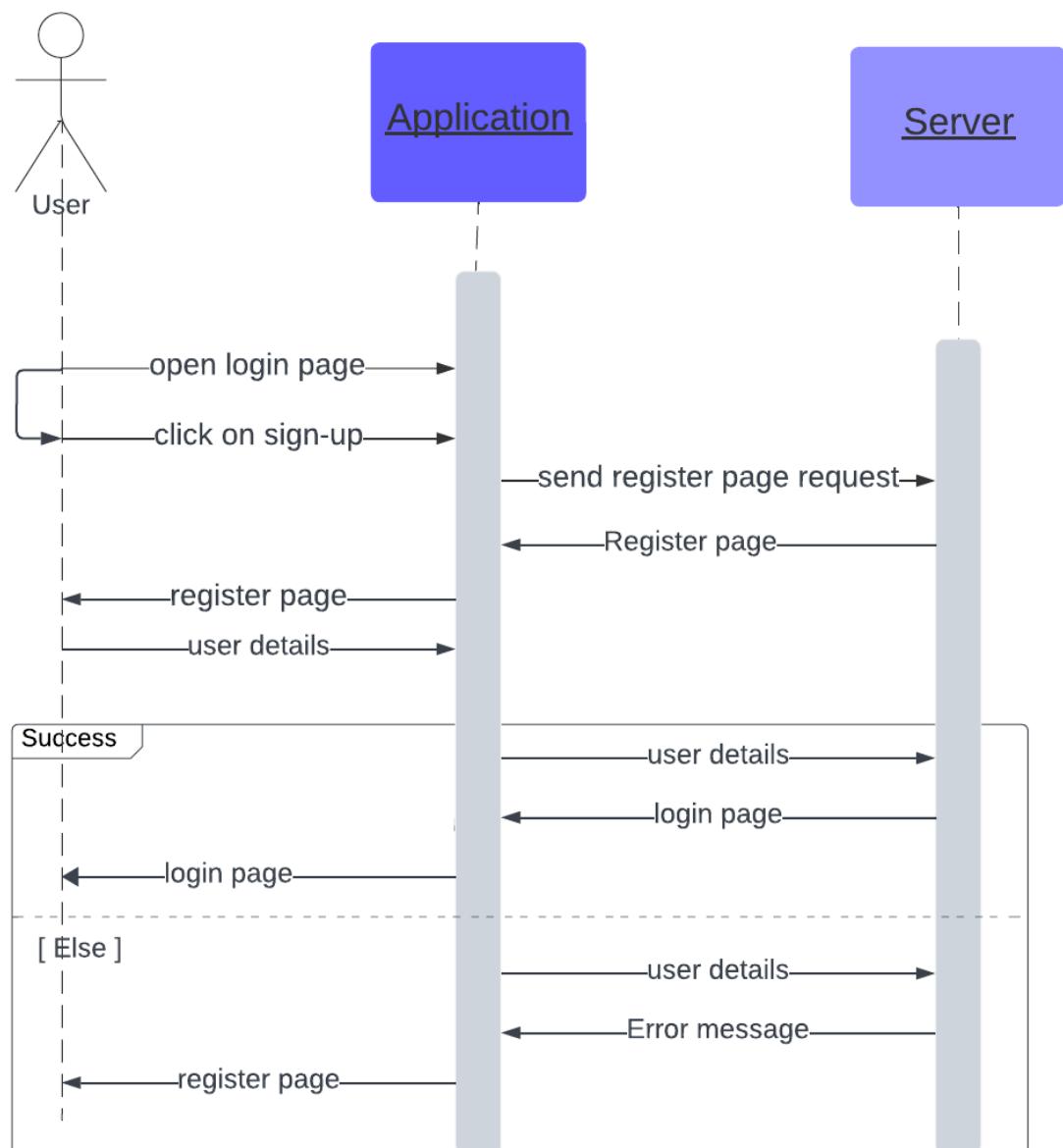


- Admin Activity Diagram

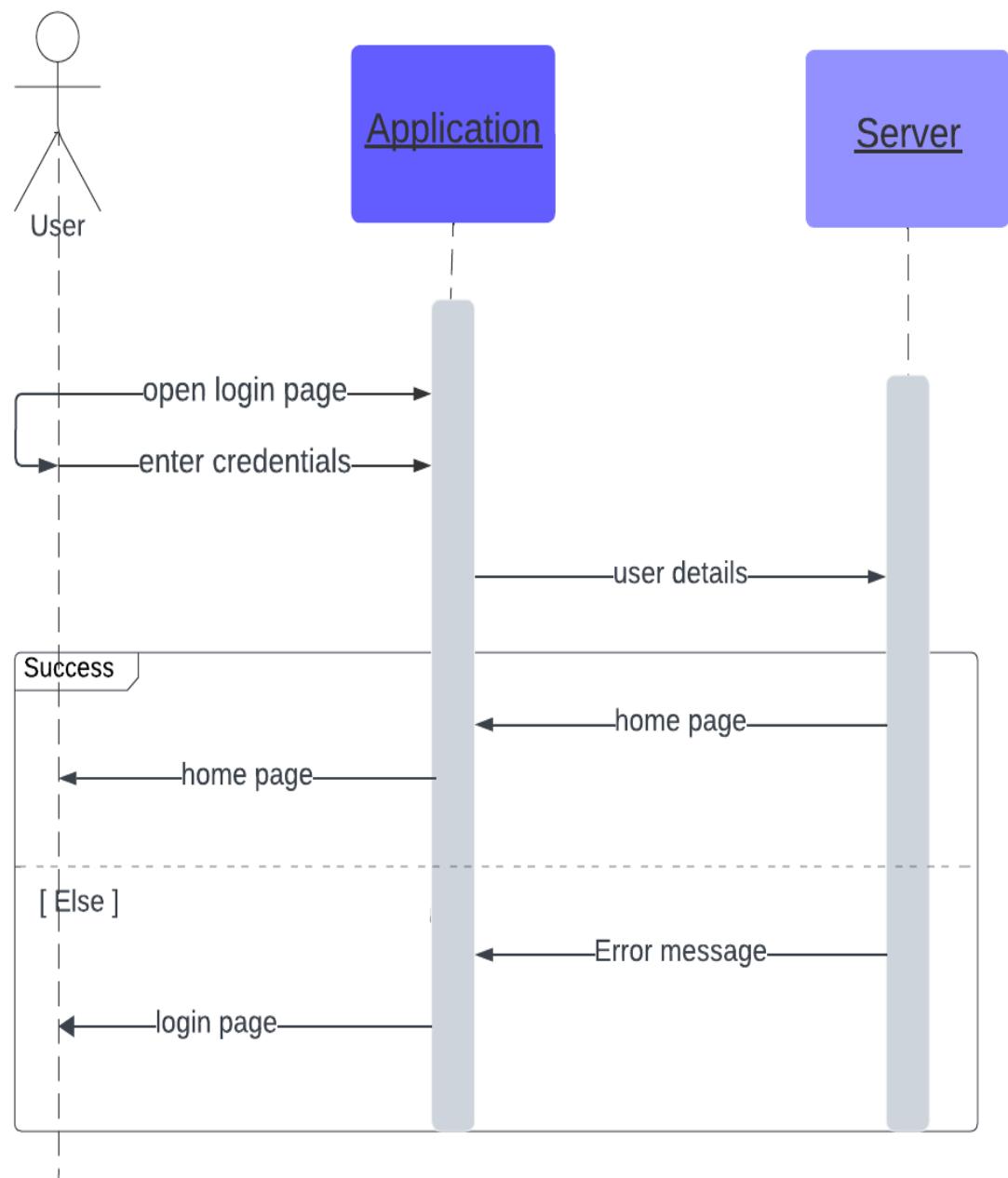


5.2.4 Sequence Diagram

- Registration

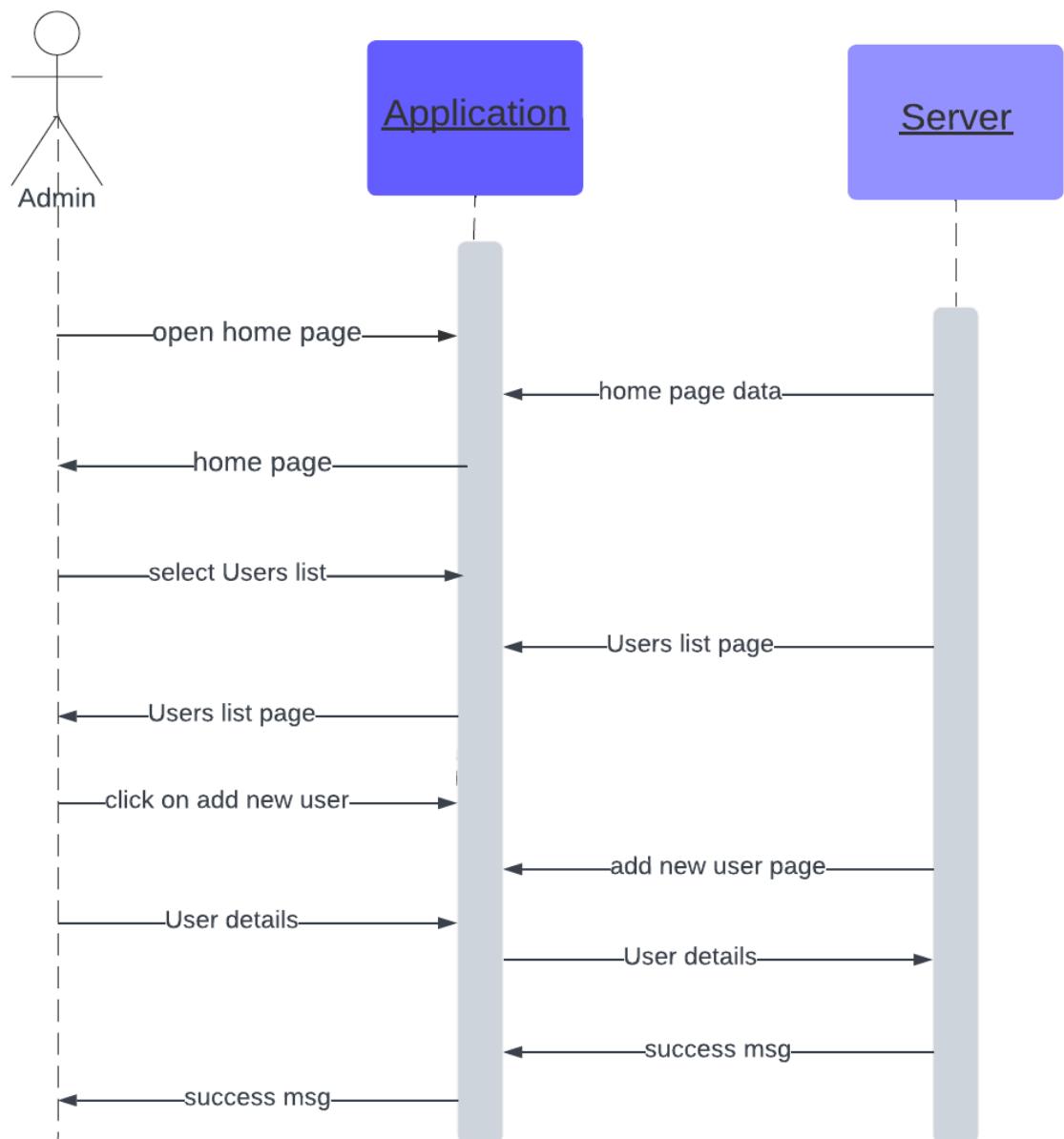


- Login

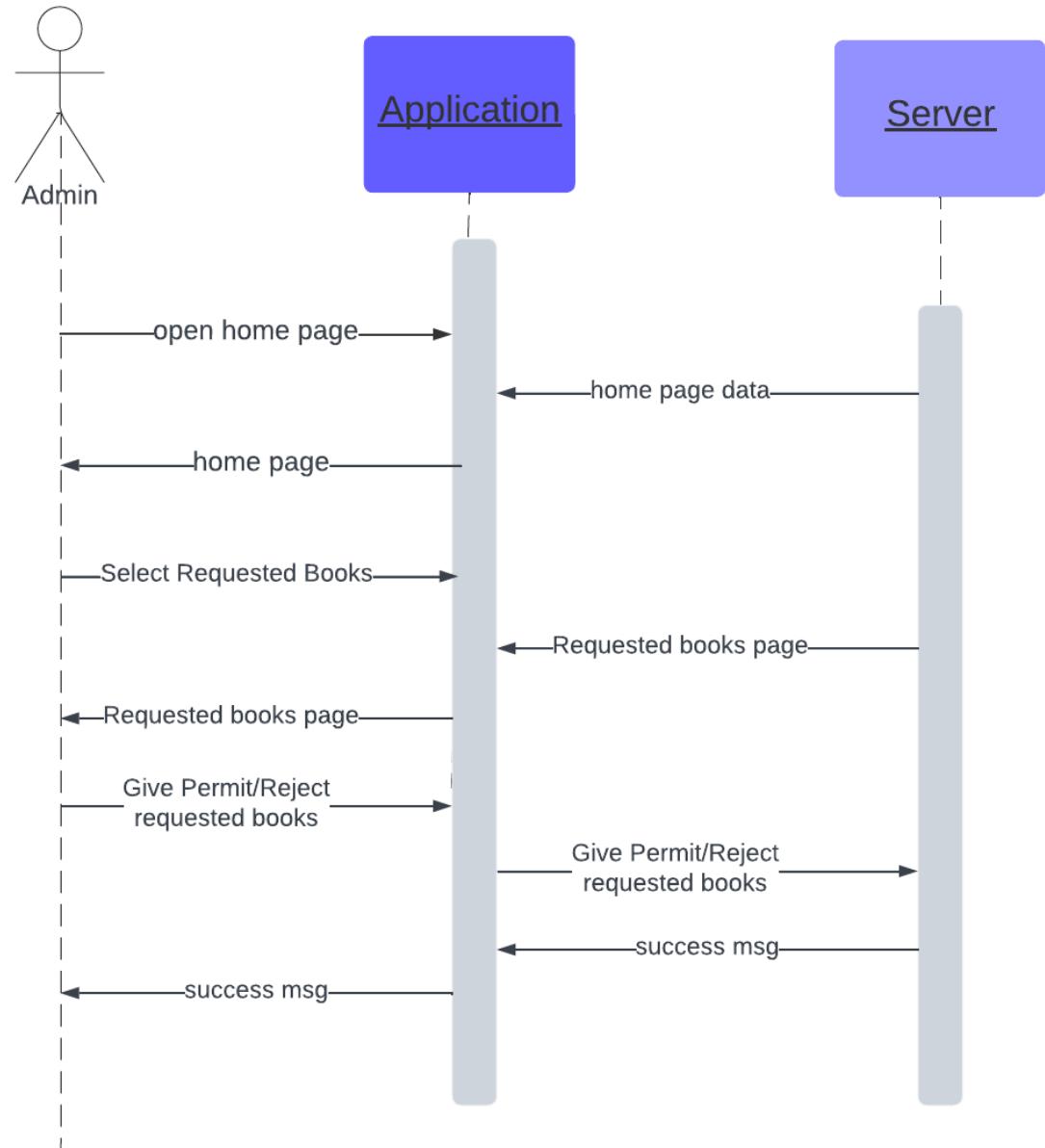


- Admin functionalities

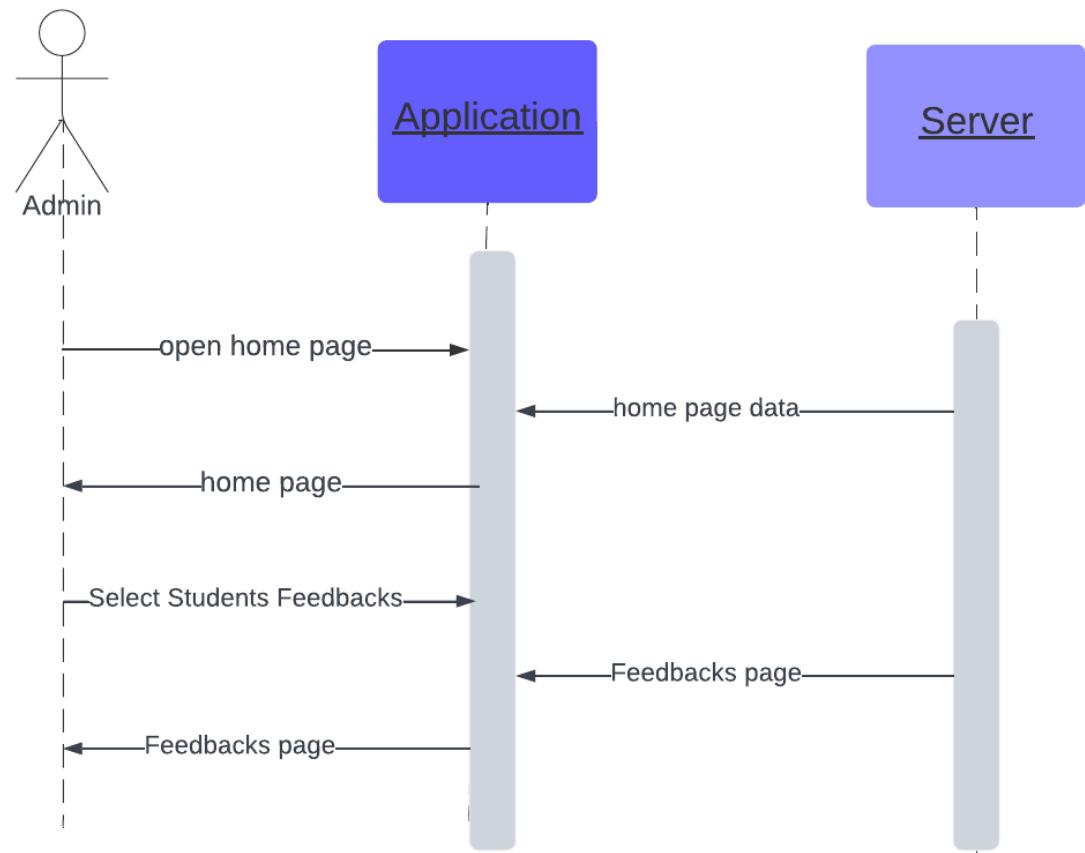
- Add user



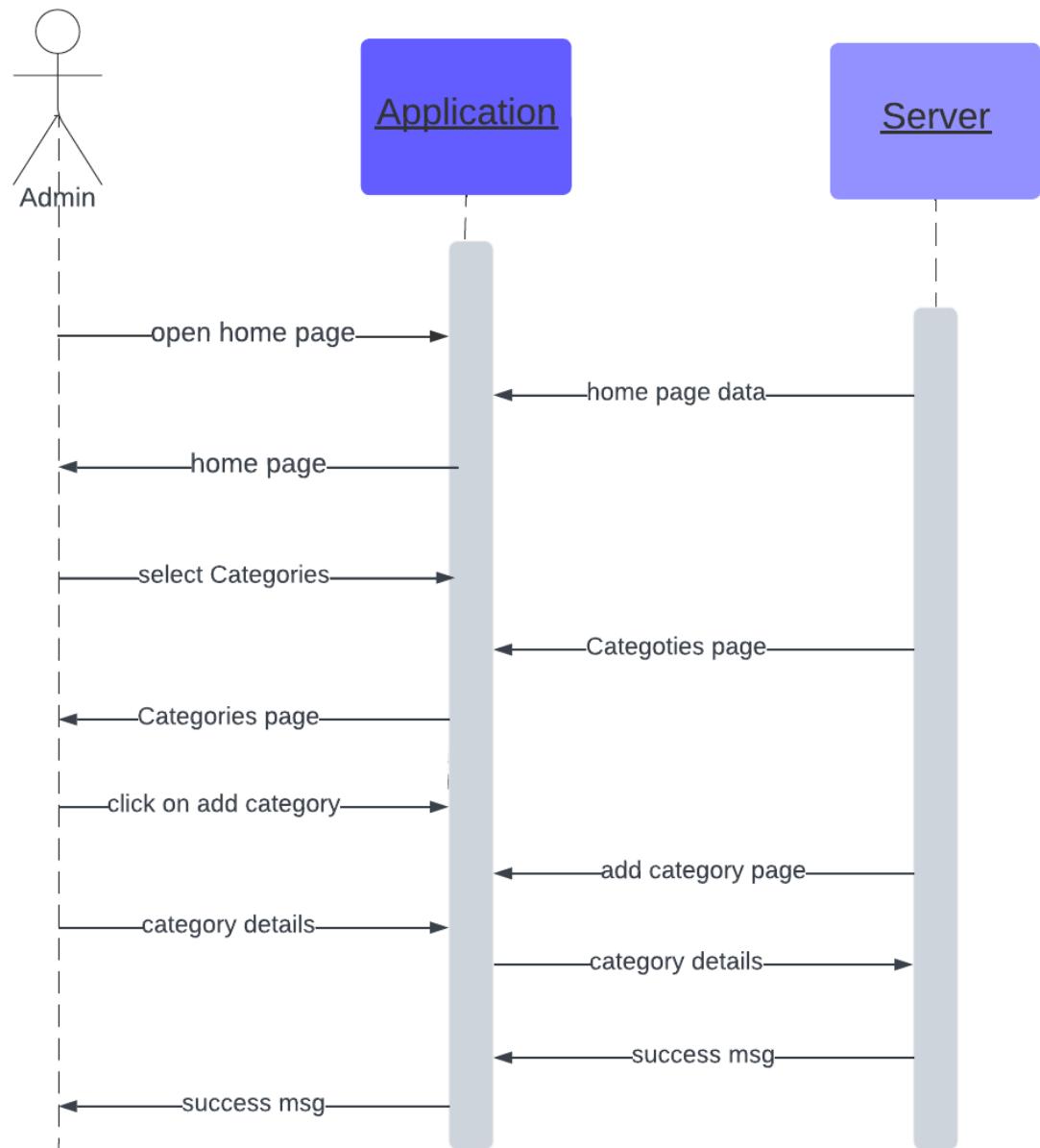
- Permit/reject requested books



- Get all Feedback page

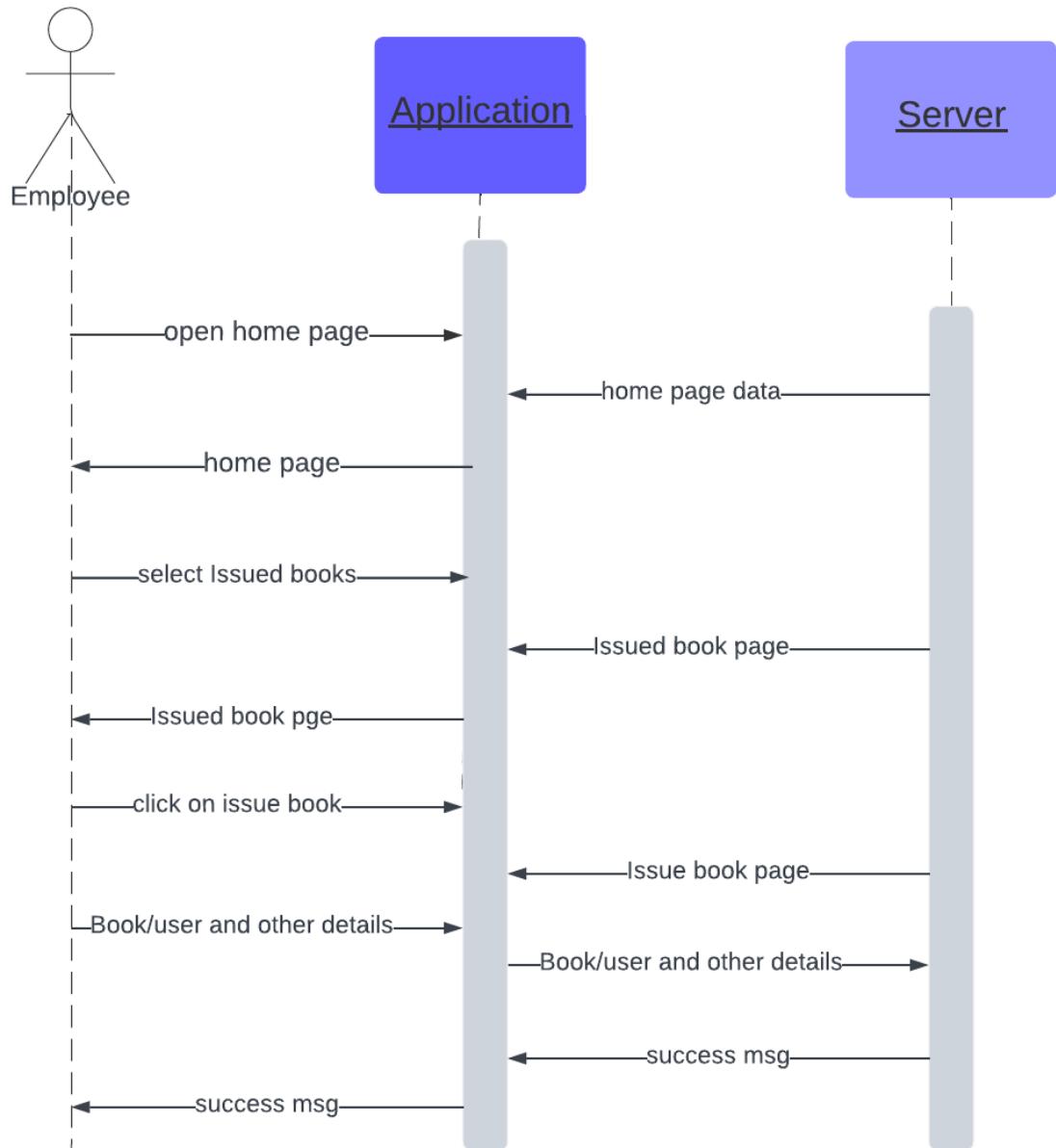


- Add category

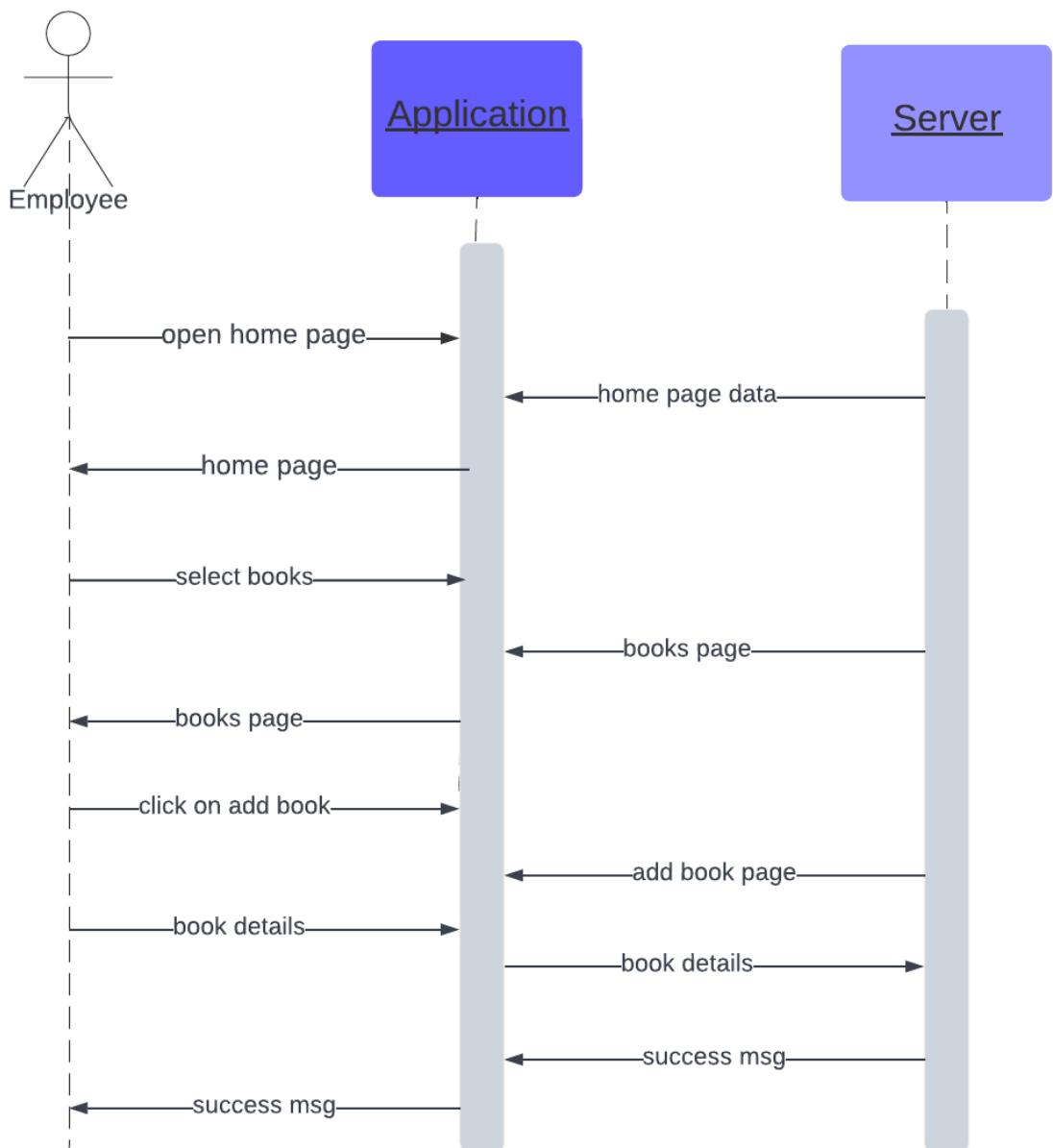


- Employee Functionalities

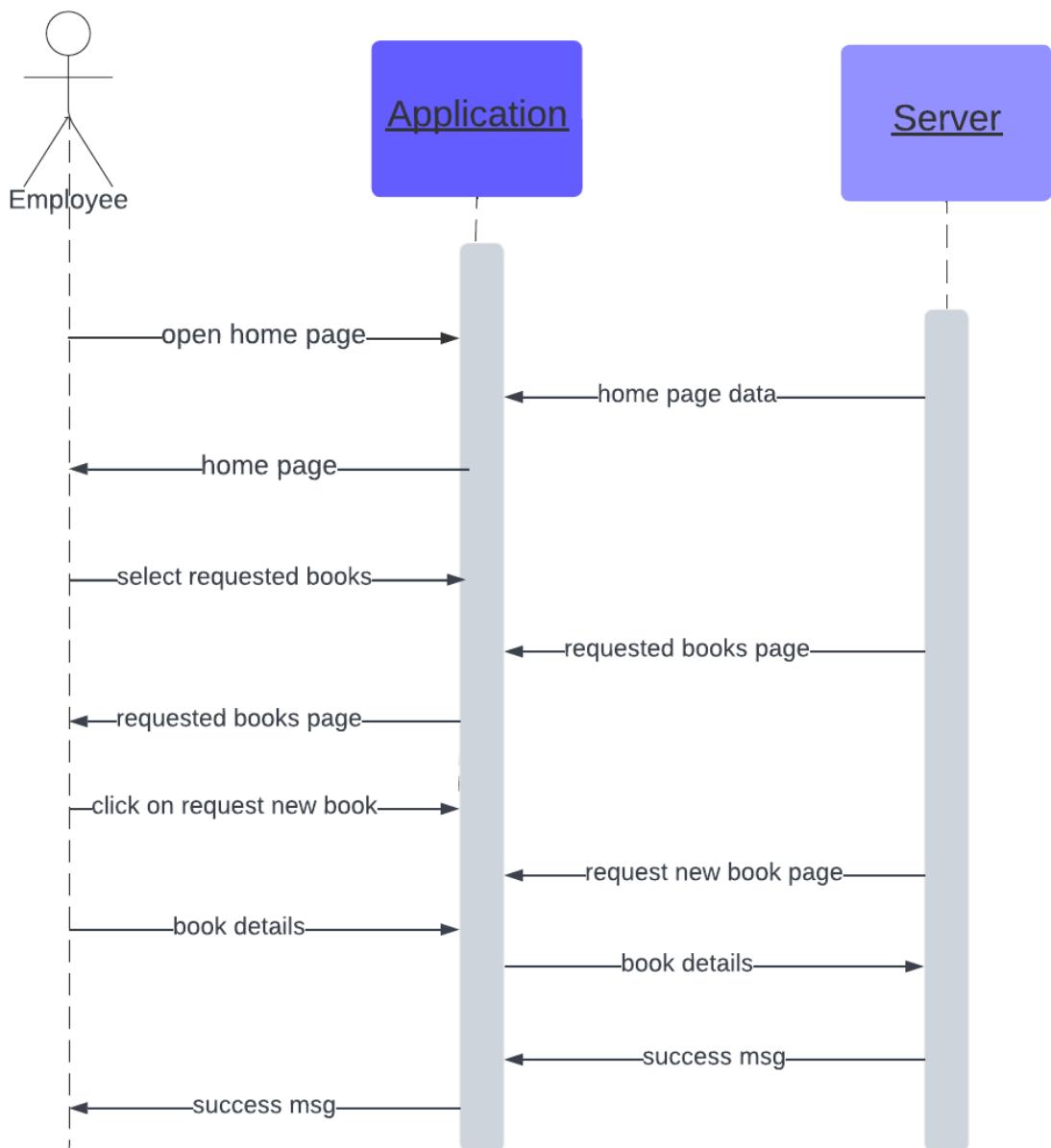
- Issued book Page



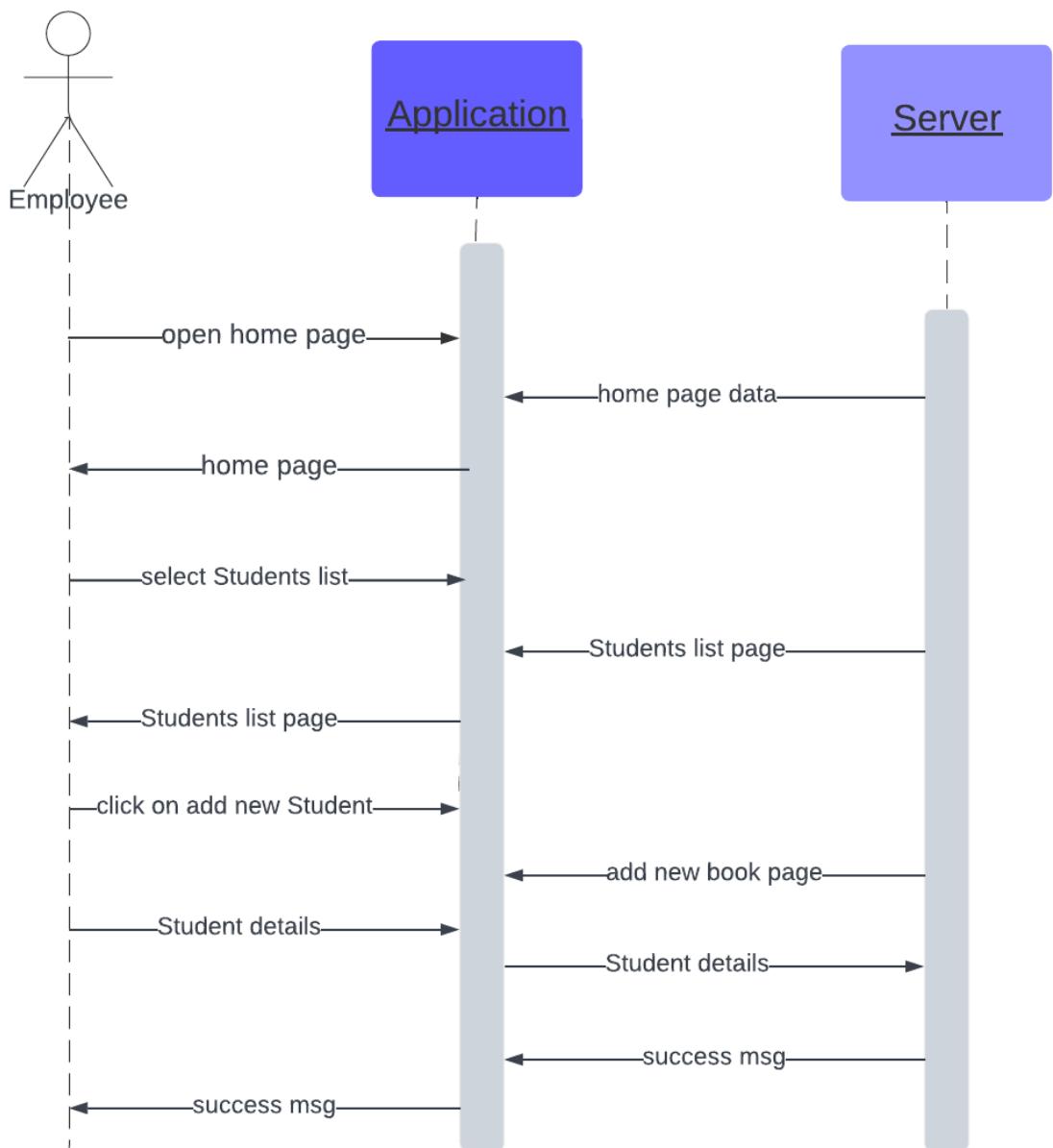
- Add book page



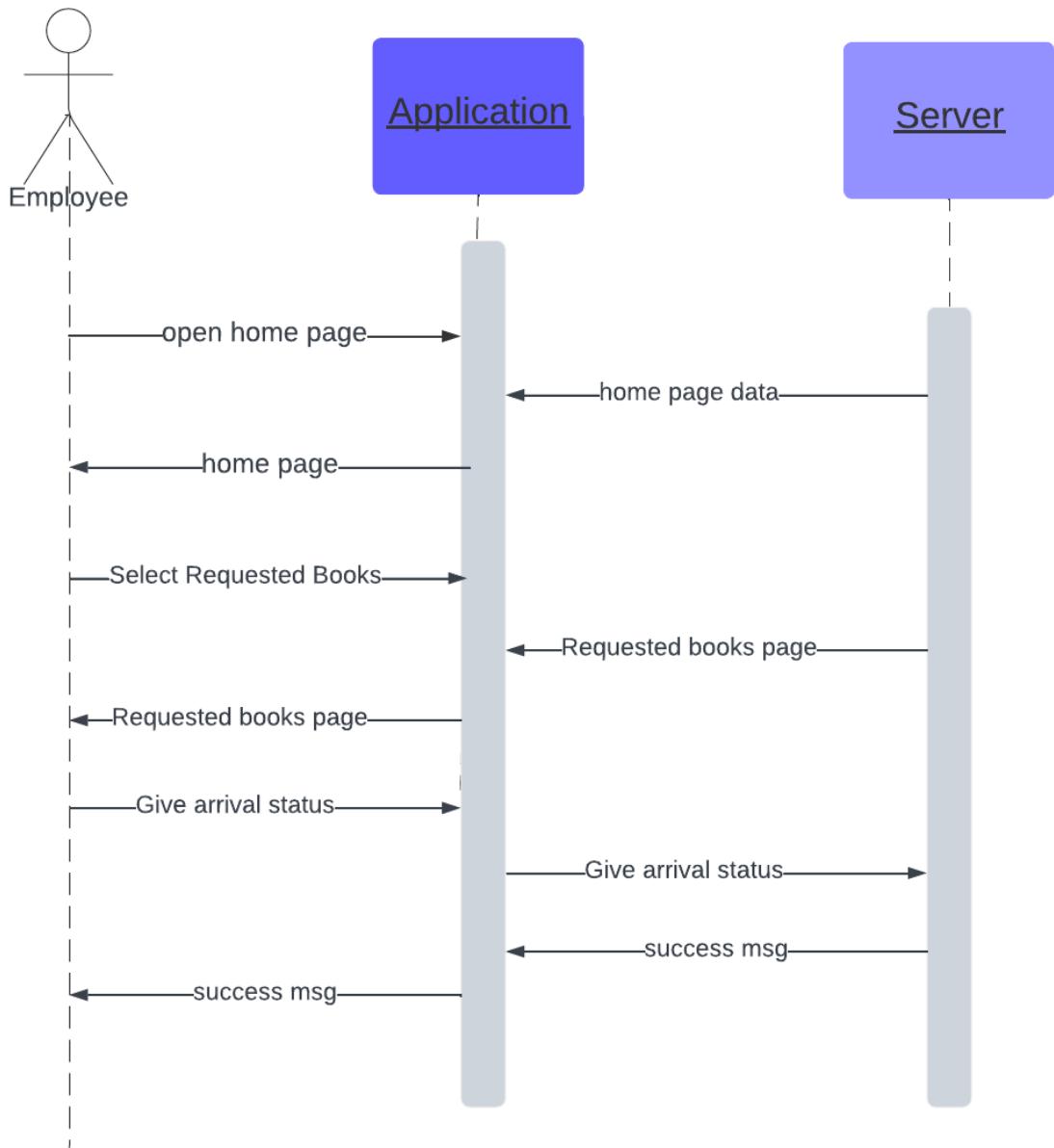
- Requested book page



- Add new page

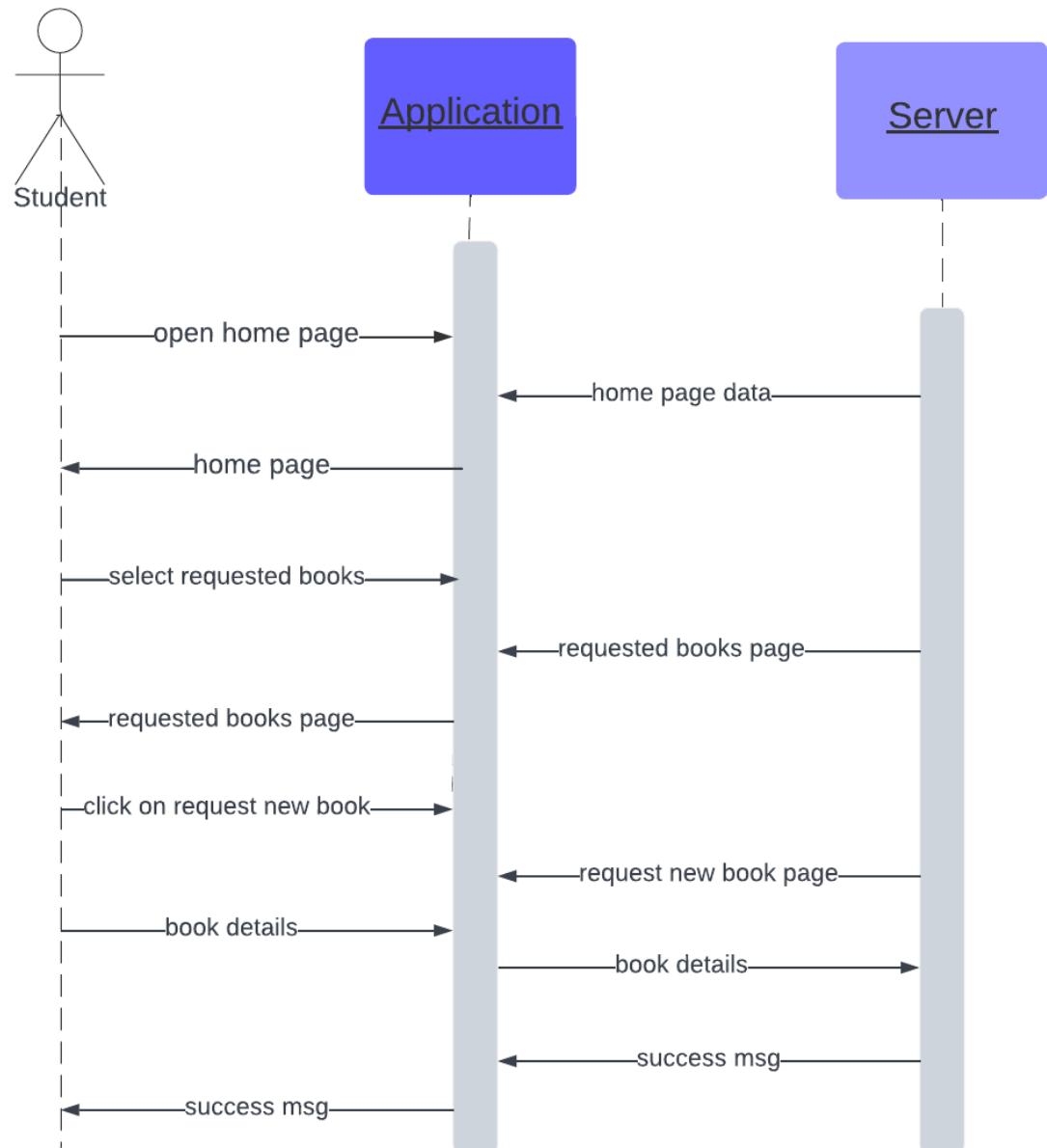


- Manage arrival status of book

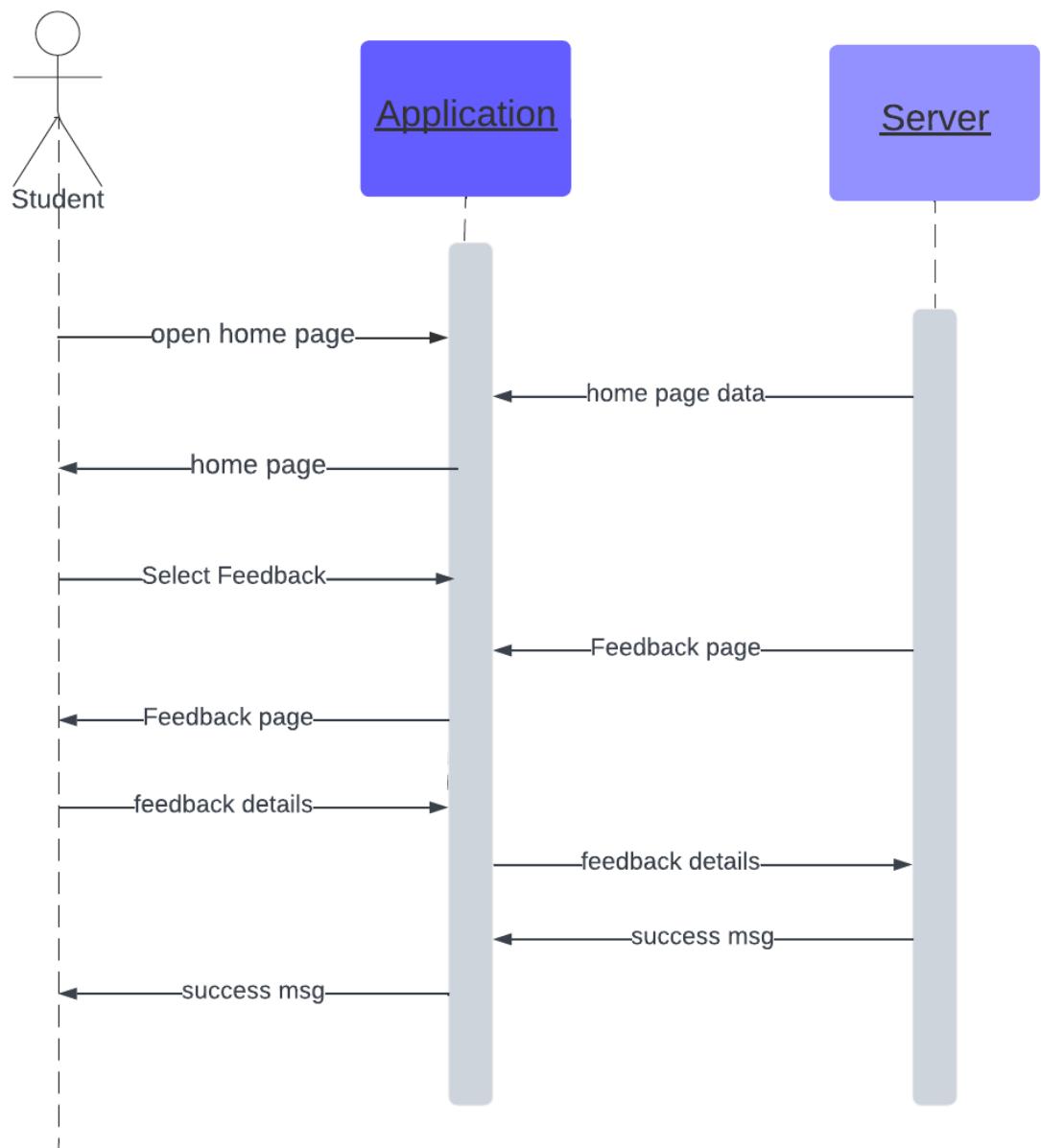


- **Student functionalities**

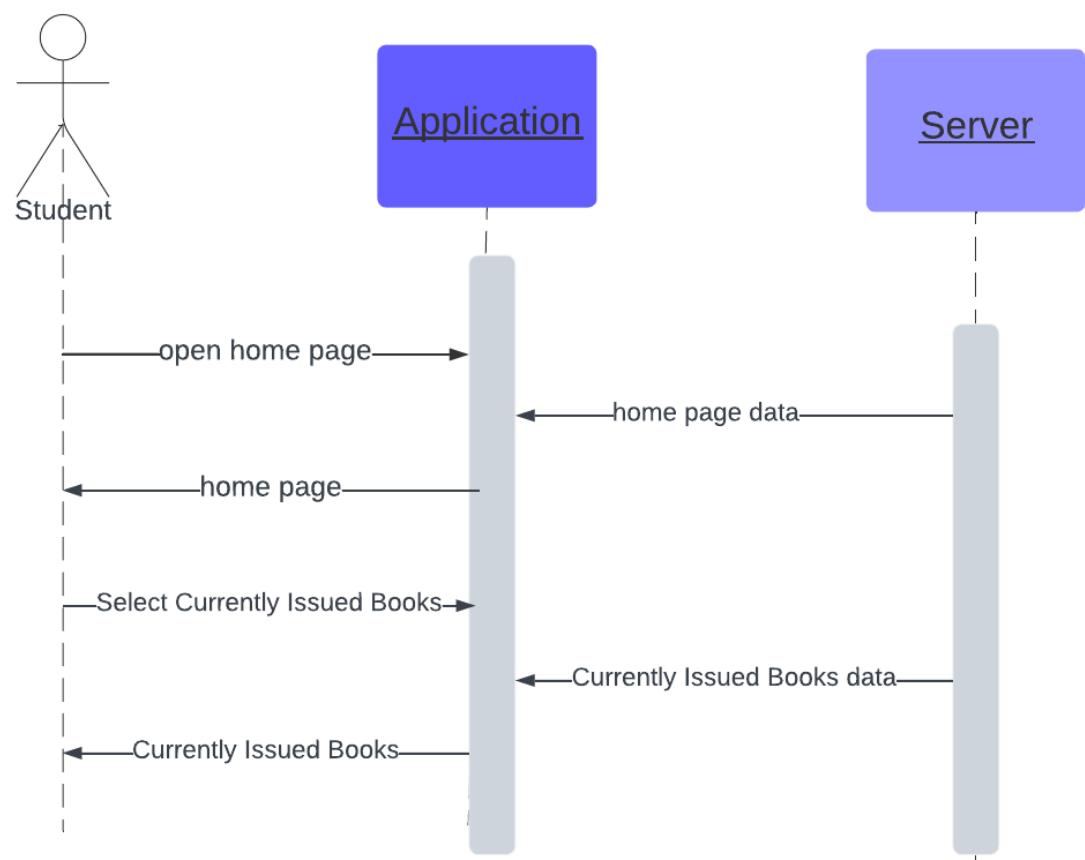
- Request new book



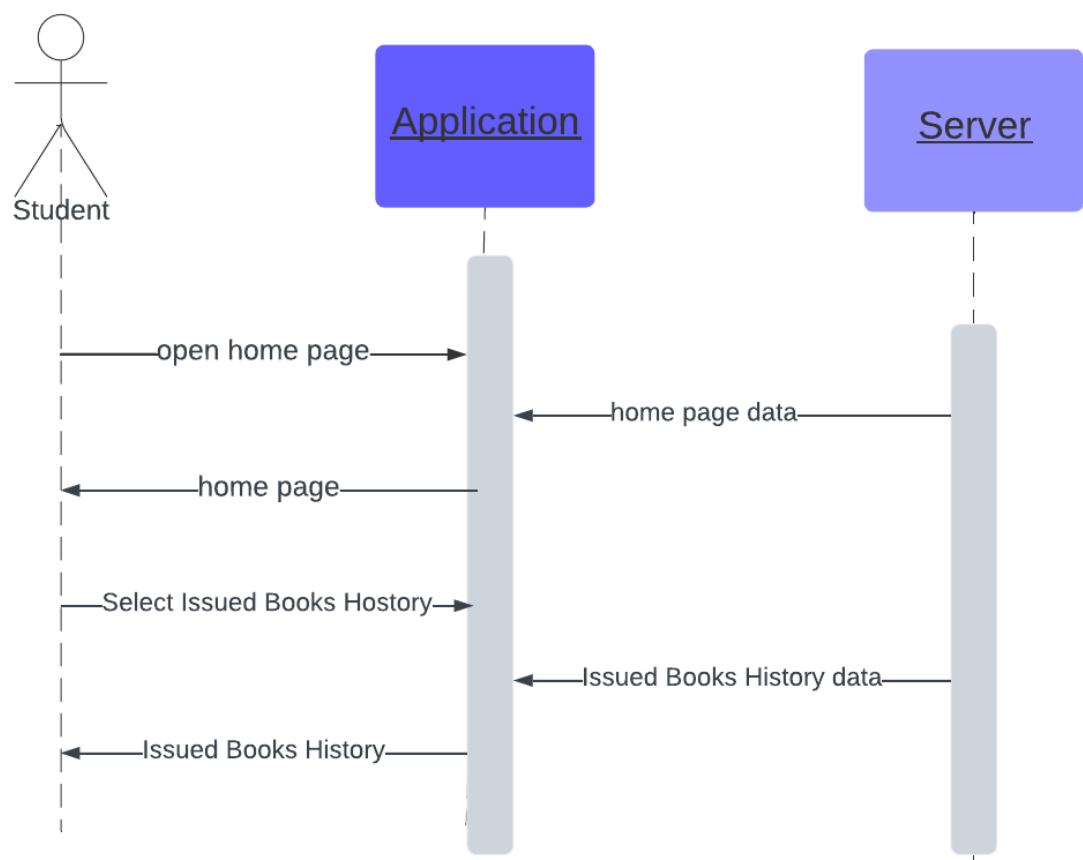
- Add feedback



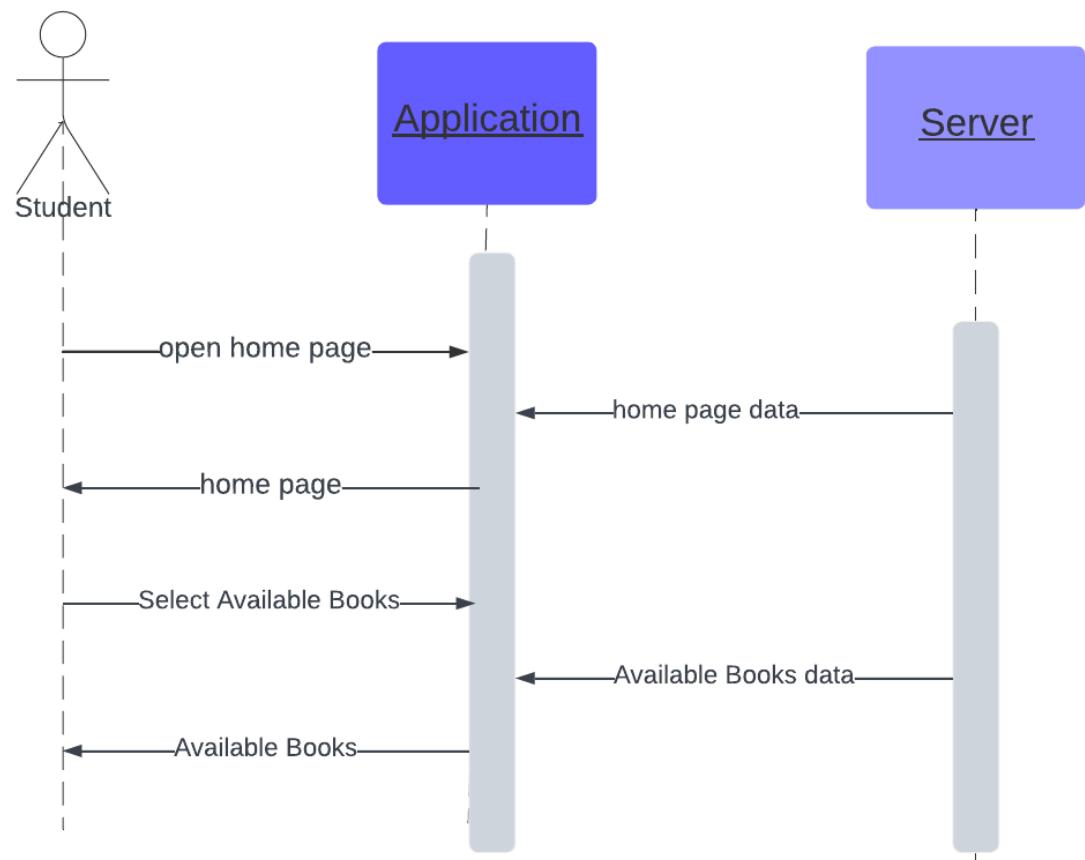
- Currently issued book



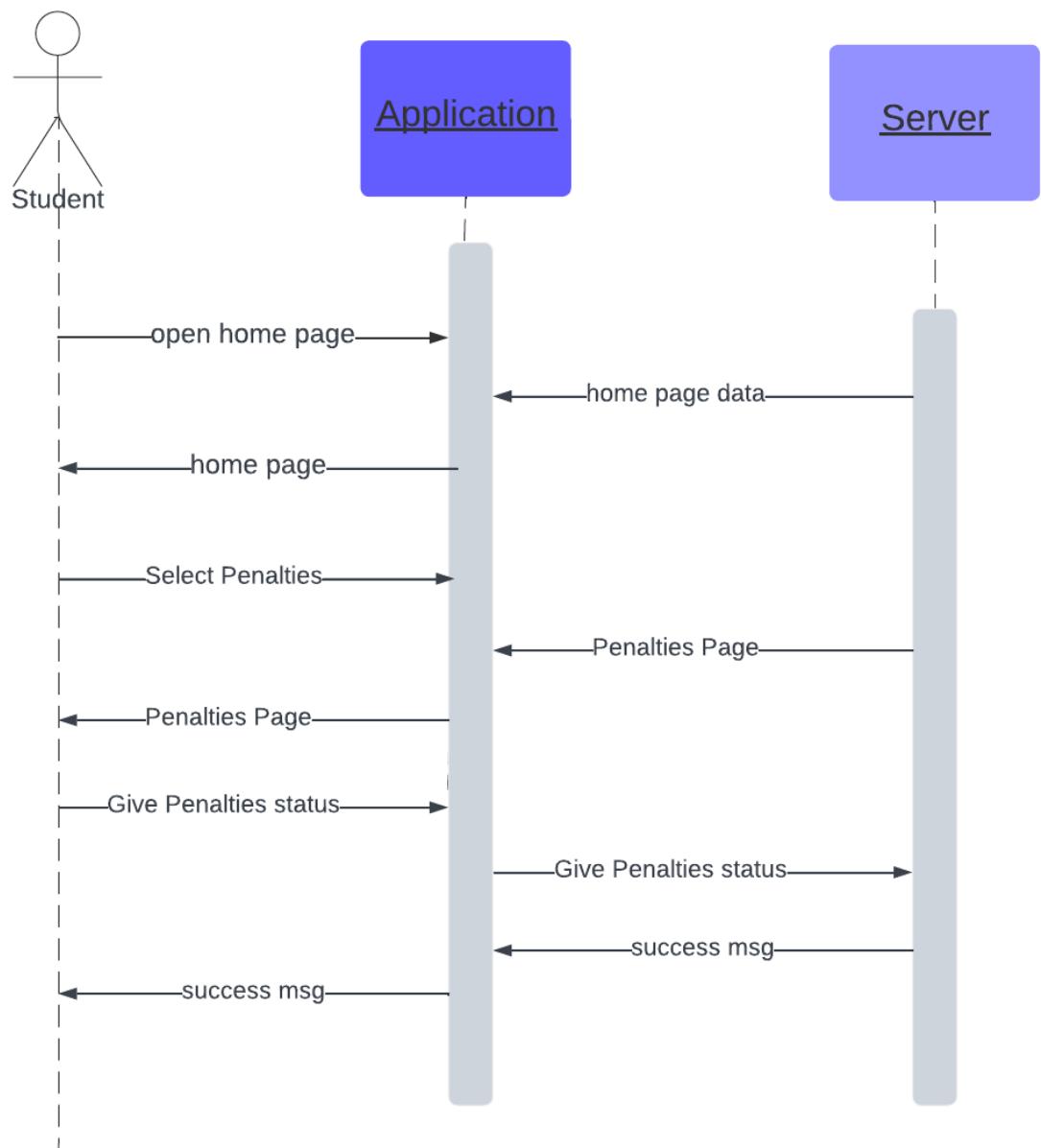
- Issued book history data



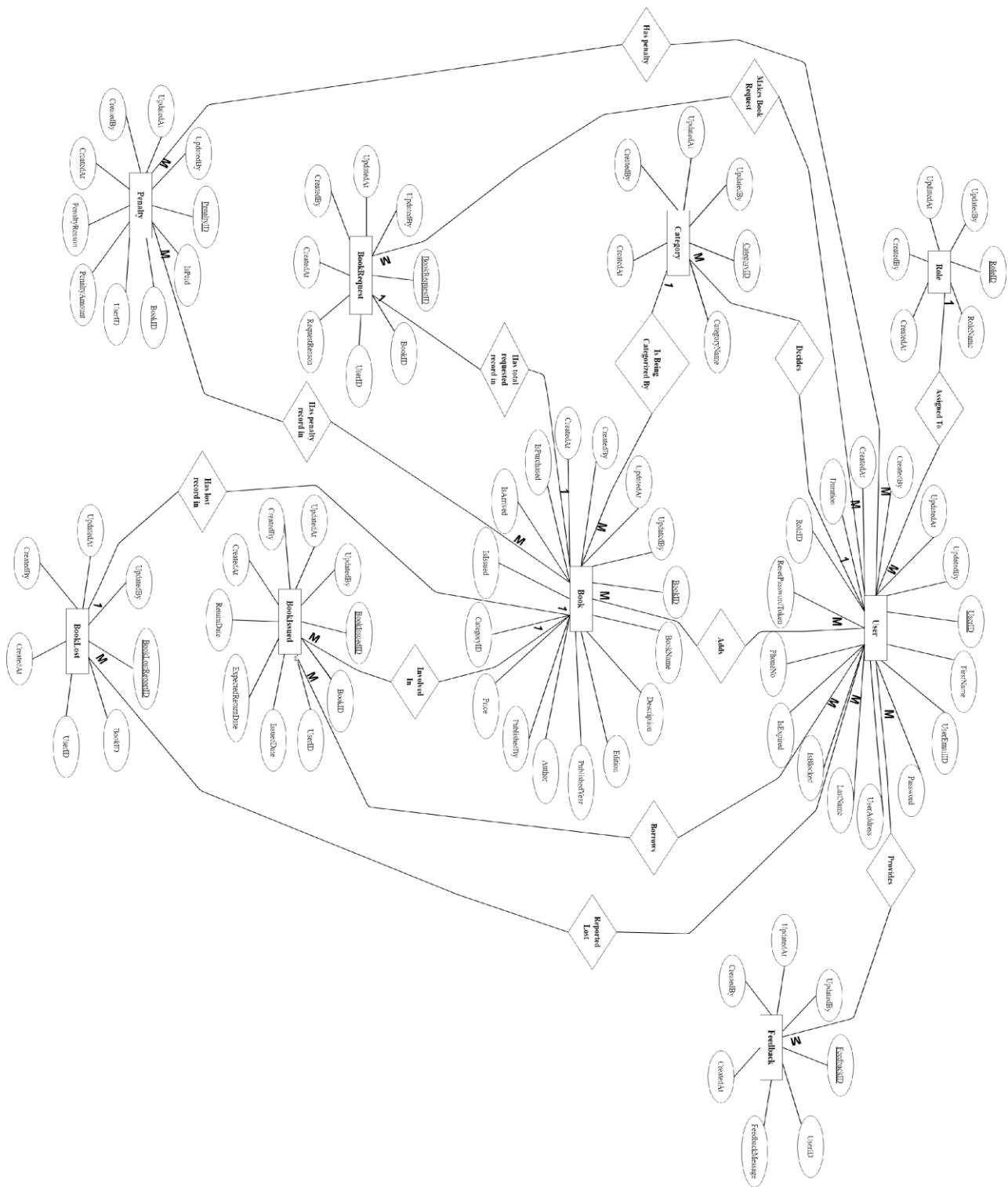
- Available books



- o Penalties page



5.3 ER Diagram



6. Software Design

6.1 Database Design

RoleMaster

Field	Type	Constraint
RoleID	Int	Primary key
RoleName	Varchar(50)	Not Null
CreatedBy	Int	
CreatedAt	DateTime	
UpdatedBy	Int	
UpdatedAt	DateTime	

UserMaster

Field	Type	Constraint
UserID	Int	Primary key
FirstName	Varchar(50)	Not Null
LastName	Varchar(50)	Not Null
UserEmailID	Varchar(256)	Not Null,Unique
Password	Varchar(10)	Not Null
UserAddress	Varchar(max)	Not Null
RoleID	Int	Foreign Key
PhoneNo	Varchar(10)	
ResetPasswordToken	Varchar(30)	
Duration	Int	Not Null
IsBlocked	Boolean	DEFAULT(False)
IsExpired	Boolean	DEFAULT(False)
CreatedBy	Int	
CreatedAt	DateTime	
UpdatedBy	Int	
UpdatedAt	DateTime	

CategoryMaster

Field	Type	Constraint
CategoryID	Int	Primary key
CategoryName	Varchar(50)	Not Null,Unique
CreatedBy	Int	

CreatedAt	DateTime	
UpdatedBy	Int	
UpdatedAt	DateTime	

BookMaster

Field	Type	Constraint
BookID	Int	Primary key
BookName	Varchar(200)	Not Null
Description	Varchar(max)	
Edition	Int	NOT NULL
PublishedYear	Int	NOT NULL
Author	Varchar(50)	NOT NULL
PublishedBy	Varchar(50)	NOT NULL
Price	Float	NOT NULL
CategoryID	Int	Foreign Key
IsIssued	Boolean	Default(False)
IsArrived	Boolean	
IsPurchased	Boolean	
CreatedBy	Int	
CreatedAt	DateTime	
UpdatedBy	Int	
UpdatedAt	DateTime	

BookIssuedMaster

Field	Type	Constraint
BookIssuedID	Int	Primary key
BookID	Int	Foreign Key
UserID	Int	Foreign Key
IssuedDate	DateTime	
ExpectedReturnDate	DateTime	Not Null
ReturnDate	DateTime	
CreatedBy	Int	
CreatedAt	DateTime	
UpdatedBy	Int	
UpdatedAt	DateTime	

BookRequestMaster

Field	Type	Constraint
BookRequestID	Int	Primary key
BookID	Int	Foreign Key
UserID	Int	Foreign Key
RequestReason	Varchar(50)	Not Null
CreatedBy	Int	
CreatedAt	DateTime	
UpdatedBy	Int	
UpdatedAt	DateTime	

PenaltyMaster

Field	Type	Constraint
PenaltyID	Int	Primary key
BookID	Int	Foreign Key
UserID	Int	Foreign Key
IsPaid	Boolean	DEFAULT(False)
PenaltyAmount	Float	Not Null
PenaltyReason	Varchar(50)	Not Null
CreatedBy	Int	
CreatedAt	DateTime	
UpdatedBy	Int	
UpdatedAt	DateTime	

BookLostReportMaster

Field	Type	Constraint
BookLostReportID	Int	Primary key
BookID	Int	Foreign Key
UserID	Int	Foreign Key
CreatedBy	Int	
CreatedAt	DateTime	
UpdatedBy	Int	
UpdatedAt	DateTime	

FeedbackMaster

Field	Type	Constraint
FeedbackID	Int	Primary key
UserID	Int	Foreign Key

FeedbackMessage	Varchar(max)	
CreatedBy	Int	
CreatedAt	DateTime	
UpdatedBy	Int	
UpdatedAt	DateTime	

6.2 Interface Design sitemap followed with page snapshots

- Register

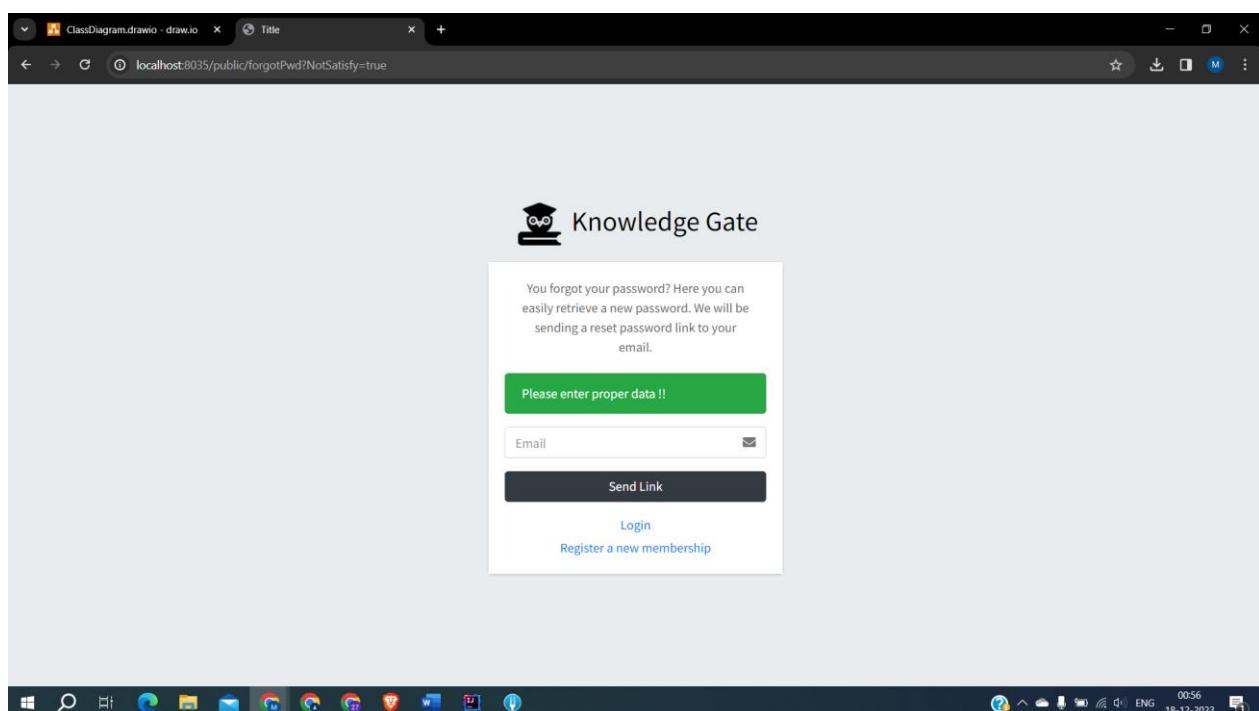
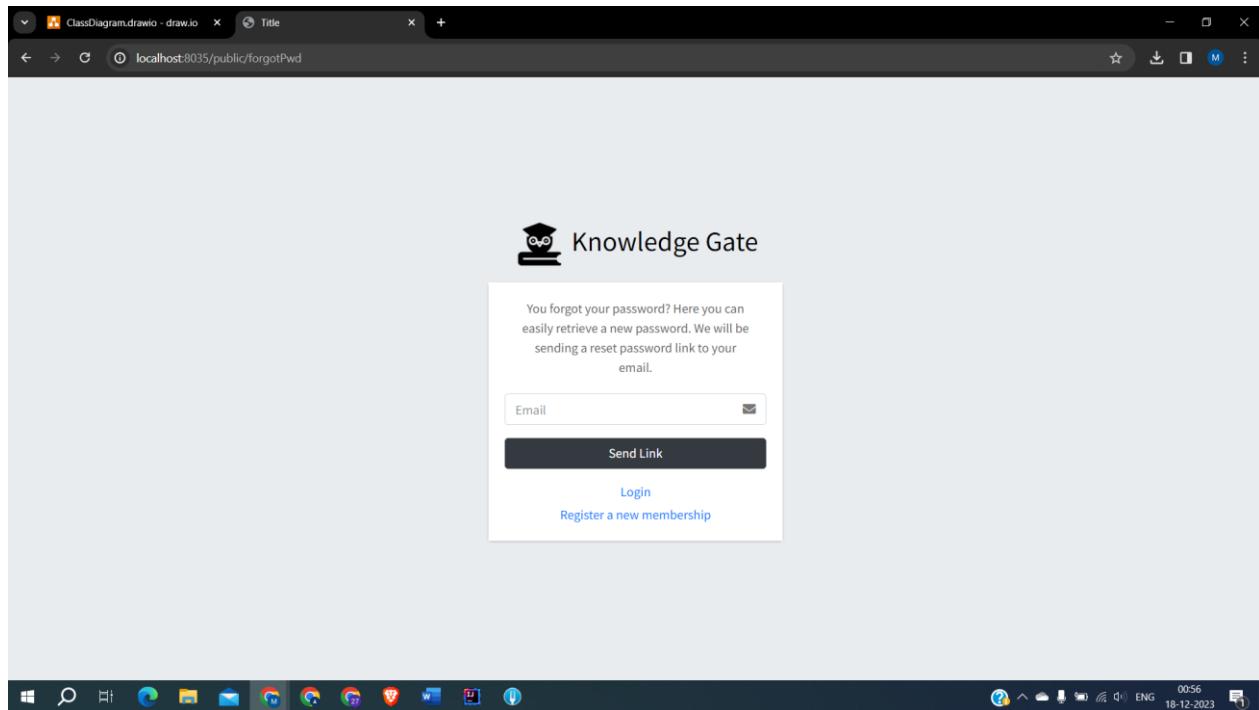
The screenshot shows a web browser window titled "Register" with the URL "localhost:8035/public/createNewEmployee". The page has a header "Knowledge Gate" with a graduation cap icon. A message "Register a new membership" is displayed above a list of validation errors in red:

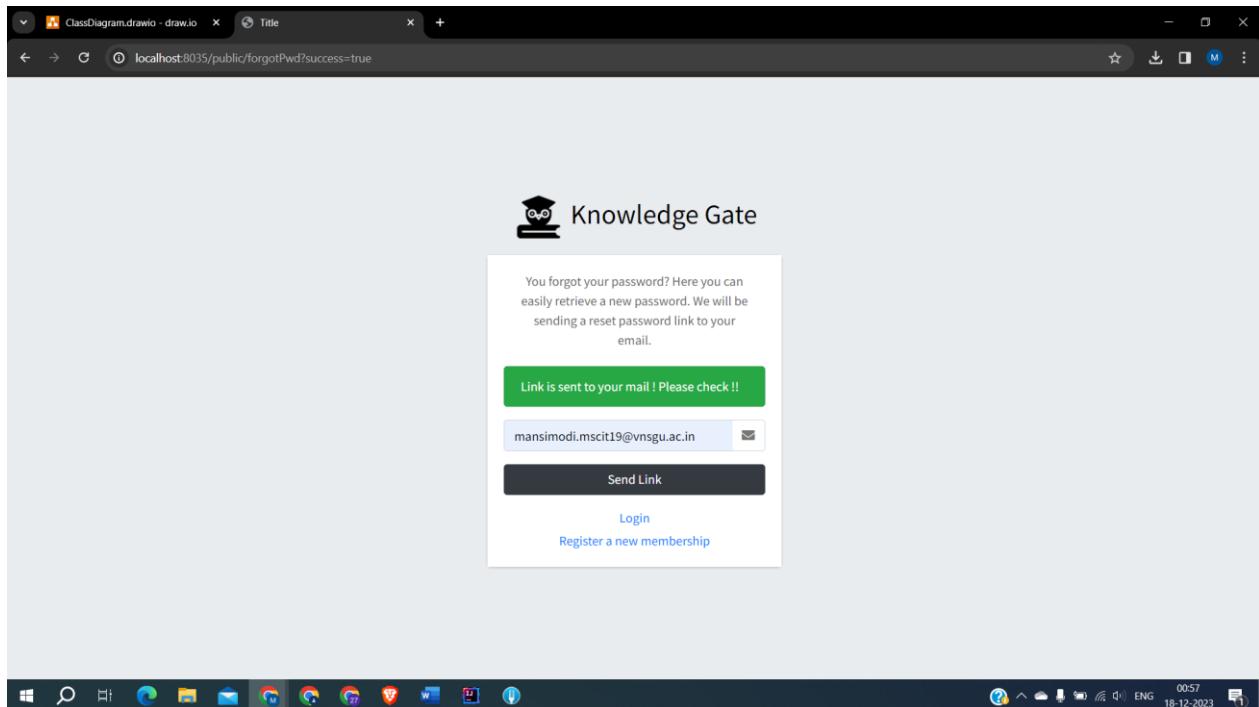
- EmailID must not be blank !!
- LastName must not be blank !!
- FirstName must not be blank !!
- Password must not be blank
- Phone Number must be added !!
- UserAddress must not be blank !!

Below the errors is a form with fields for First name, Last name, Email, Password, Phone No., and Address, each with a small icon next to it. A "Register" button is at the bottom, and a link "I already have a membership" is below it. The browser's taskbar and system tray are visible at the bottom.

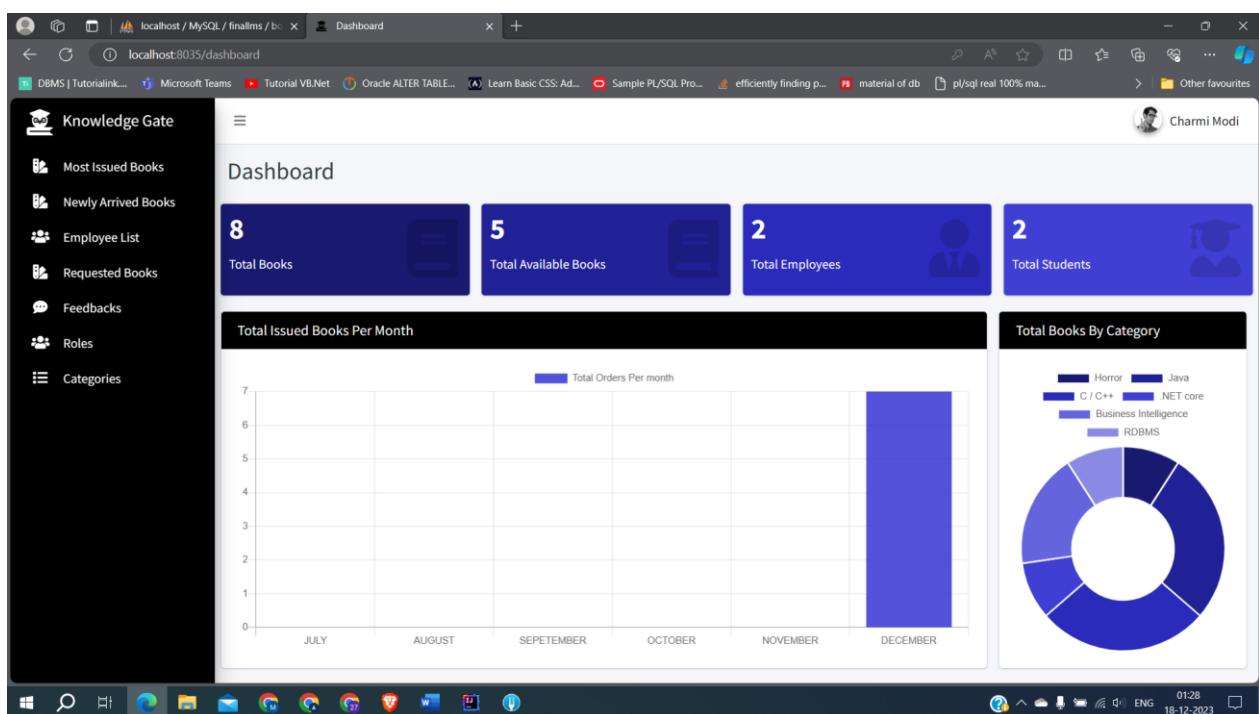
The screenshot shows a web browser window titled "Register" with the URL "localhost:8035/public/register". The page has a header "Knowledge Gate" with a graduation cap icon. A message "Register a new membership" is displayed above a form with fields for First name, Last name, Email, Password, Phone No., and Address, each with a small icon next to it. A "Register" button is at the bottom, and a link "I already have a membership" is below it. The browser's taskbar and system tray are visible at the bottom.

- Forgot Password





● Admin Dashboard



● Most Issued Books

Book Name	Description	Edition	Author	Published By	Published On	Price	Category
PROGRAMMING IN ANSI C	This book is so good for beginners who wants to learn C	8	E Balagurusamy	McGraw Hill Education	2019	1000.0	C / C++
Let Us C	The new edition of this classic book has been thoroughly revamped but remains faithful to the principles that have established it as a favourite amongst students, teachers and software professionals round the world	19	Yashvant Kanetkar	BPB Publications	2022	900.0	C / C++
Programming with Java	Retaining its quintessential style of concept explanation with exhaustive programs, solved examples, and illustrations, this test takes the journey of understanding JAVA to slightly higher level	6	E Balagurusamy	McGraw Hill Education	2019	950.0	Java
Java 8 Programming Black Book	Java 8 Black Book is a solid introductory reference that has been written from the experts' point of view and so includes hundreds of examples covering every feature of the subject.	3	D.T. Editorial Services	Dreamtech Press	2015	950.0	Java
ASP.NET 4.5 Black Book	ASP. NET 4.5 Black Book is the one-time reference book, written from the programmer's point of view, containing hundreds of examples and covering nearly every aspect of ASP. NET 4. 5 in both VB and C#.	5	Kogent Learning Solutions Inc.	Dreamtech Press	2013	600.0	.NET core

Book Name	Description	Edition	Author	Published By	Published On	Price	Category	Arrived On
head first java	This book combines puzzles, strong visuals, mysteries, and soul-searching interviews with famous Java objects to engage you in many different ways. It's fast, it's fun, and it's effective	3	Kathy Sierra	O'Reilly	2022	1100.0	Java	18-12-2023
SQL All-in-One For Dummies	one-stop shop for everything you need to know about SQL and SQL-based relational databases	3	Allen G. Taylor	For Dummies	2019	800.0	RDBMS	14-12-2023
Building the Data Warehouse	to explaining the fundamentals of data warehouse systems, the book covers new topics such as methods for handling unstructured data in a data warehouse and storing data across multiple storage media	4	W. H. Inmon	Wiley	2005	3500.0	Business Intelligence	13-12-2023
Building the Data Warehouse	to explaining the fundamentals of data warehouse systems, the book covers new topics such as methods for handling unstructured data in a data warehouse and storing data across multiple storage media	4	W. H. Inmon	Wiley	2005	3500.0	Business Intelligence	13-12-2023
ASP.NET 4.5 Black Book	ASP. NET 4.5 Black Book is the one-time reference book, written from the programmer's point of view, containing hundreds of examples and covering nearly every aspect	5	Kogent Learning Solutions Inc.	Dreamtech Press	2013	600.0	.NET core	13-12-2023

- Employee List

The screenshot shows a web application interface for managing employees. On the left, there is a sidebar titled "Knowledge Gate" with links for "Most Issued Books", "Newly Arrived Books", "Employee List", "Requested Books", "Feedbacks", "Roles", and "Categories". The main content area is titled "Employees" and displays a table with one row. The table columns are "First Name", "Last Name", "Email ID", "Address", and "Role". The data in the table is: First Name - jaimin, Last Name - Bhatt, Email ID - jaiminbhatt.mscit19@vngu.ac.in, Address - Dindoli, Surat, and Role - EMPLOYEE. To the right of the table is a blue button labeled "+ Add New User". The browser address bar shows "localhost:8035/admin/getUserList". The system status bar at the bottom indicates "0033", "ENG", and the date "18-12-2023".

- CRUD Employee

The screenshot shows the "Add Employee" form. The sidebar on the left is identical to the previous screenshot. The main form has fields for "First Name", "Last Name", "Email ID", "Password", "Role", "Phone No.", and "Address". Each field has a red validation message below it: "FirstName must not be blank !!", "LastName must not be blank !!", "EmailID must not be blank !!", "Password must not be blank", "Role must be selected", "Phone Number must be added !!", and "UserAddress must not be blank !!". A blue "Save" button is at the bottom. The browser address bar shows "localhost:8035/admin/saveEmployee". The system status bar at the bottom indicates "0034", "ENG", and the date "18-12-2023".

The screenshot shows a web application interface for adding a new employee. On the left, there is a sidebar with a dark background containing the 'Knowledge Gate' logo and several menu items: Most Issued Books, Newly Arrived Books, Employee List, Requested Books, Feedbacks, Roles, and Categories. The main content area has a light gray background. At the top, it says 'Add Employee'. Below that are input fields for First Name (nisha), Last Name (patel), Email ID (mansimodi.mscit19@vnsgu.ac.in), Password (Admin@123), Role (ADMIN), and Phone No (9808987877). There is also an 'Address' field containing 'jahangirpura,surat'. A blue 'Save' button is located at the bottom left of the form area. The browser's address bar shows 'localhost:8035/admin/addNewEmployee'. The system tray at the bottom right indicates the date as 18-12-2023 and the time as 00:35.

The screenshot shows a web application interface for viewing the employee list. The sidebar on the left is identical to the previous screenshot. The main content area displays a table titled 'Employees' with two rows of data. The columns are labeled: First Name, Last Name, Email ID, Address, and Role. The first row contains 'jaimin' (Bhatt) with email 'jaiminbhatt.mscit19@vnsgu.ac.in', address 'Dindoli, Surat', and role 'EMPLOYEE'. The second row contains 'nisha' (patel) with email 'mansimodi.mscit19@vnsgu.ac.in', address 'jahangirpura,surat', and role 'EMPLOYEE'. To the right of the table is a blue button labeled '+ Add New User'. The browser's address bar shows 'localhost:8035/admin/getUserList'. The system tray at the bottom right indicates the date as 18-12-2023 and the time as 00:35.

First Name	Last Name	Email ID	Address	Role		
jaimin	Bhatt	jaiminbhatt.mscit19@vnsgu.ac.in	Dindoli, Surat	EMPLOYEE		
nisha	patel	mansimodi.mscit19@vnsgu.ac.in	jahangirpura,surat	EMPLOYEE		

- All requested book of student

The screenshot shows a web application titled 'Knowledge Gate' with a sidebar containing links for 'Currently Issued Books', 'Issued Books History', 'Available Books', 'Requested Books', and 'Feedback'. The main content area is titled 'All Requested Books' and displays a table with three rows of data. The columns are: Book Name, Description, Edition, Author, Published By, Published On, Price, Category, Requested On, and Arrived. The first row contains 'Programming with Java' by E Balagurusamy, published by McGraw Hill Education in 2019 at \$950.0, categorized as Java, requested on 13-12-2023, and arrived. The second row contains 'ASP.NET 4.5 Black Book' by Kogent Learning Solutions Inc., published by Dreamtech Press in 2013 at \$600.0, categorized as .NET core, requested on 13-12-2023, and arrived. The third row contains 'Object-Oriented Programming with C++' by E Balagurusamy, published by McGraw Hill Education in 2020 at \$650.0, categorized as C / C++, requested on 13-12-2023, and not arrived.

Book Name	Description	Edition	Author	Published By	Published On	Price	Category	Requested On	Arrived
Programming with Java	Retaining its quintessential style of concept explanation with exhaustive programs, solved examples, and illustrations, this test takes the journey of understanding JAVA to slightly higher level	6	E Balagurusamy	McGraw Hill Education	2019	950.0	Java	13-12-2023	Yes
ASP.NET 4.5 Black Book	ASP. NET 4.5 Black Book is the one-time reference book, written from the programmer's point of view, containing hundreds of examples and covering nearly every aspect of ASP. NET 4.5 in both VB and C#.	5	Kogent Learning Solutions Inc.	Dreamtech Press	2013	600.0	.NET core	13-12-2023	Yes
Object-Oriented Programming with C++	The new edition helps students to assess their learning by answering questions based on learning outcomes.	8	E Balagurusamy	McGraw Hill Education	2020	650.0	C / C++	13-12-2023	No

- Filter in All requested book of student Page

The screenshot shows the same 'Knowledge Gate' application and 'All Requested Books' page as the previous one. However, a search bar at the top right contains the letter 'M', filtering the results. Only two books are now visible in the table: 'Programming with Java' and 'Object-Oriented Programming with C++'. The footer of the page indicates 'Showing 1 to 2 of 2 entries (filtered from 3 total entries)'.

Book Name	Description	Edition	Author	Published By	Published On	Price	Category	Requested On	Arrived
Programming with Java	Retaining its quintessential style of concept explanation with exhaustive programs, solved examples, and illustrations, this test takes the journey of understanding JAVA to slightly higher level	6	E Balagurusamy	McGraw Hill Education	2019	950.0	Java	13-12-2023	Yes
Object-Oriented Programming with C++	The new edition helps students to assess their learning by answering questions based on learning outcomes.	8	E Balagurusamy	McGraw Hill Education	2020	650.0	C / C++	13-12-2023	No

- Add requested book

Add Book

Book Name :	Description :		
head first java	searching interviews with famous Java objects to engage you in many different ways. It's fast, it's fun, and it's effective		
Edition :	Author :	Published By :	
3	Kathy Sierra	O'Reilly	
Published Year :	Price :	Category :	
2022	1100.0	Java	
Add			

All Requested Books

Book Name	Description	Pages	Author	Publisher	Year	Price	Category	Date	Status
Programming with Java	Retaining its quintessential style of concept explanation with exhaustive programs, solved examples, and illustrations, this test takes the journey of understanding JAVA to slightly higher level	6	E Balagurusamy	McGraw Hill Education	2019	950.0	Java	13-12-2023	Yes
ASP.NET 4.5 Black Book	ASP. NET 4. 5 Black Book is the one-time reference book, written from the programmer's point of view, containing hundreds of examples and covering nearly every aspect of ASP. NET 4. 5 in both VB and C#.	5	Kogent Learning Solutions Inc.	Dreamtech Press	2013	600.0	.NET core	13-12-2023	Yes
Object-Oriented Programming with C++	The new edition helps students to assess their learning by answering questions based on learning outcomes.	8	E Balagurusamy	McGraw Hill Education	2020	650.0	C / C++	13-12-2023	No
head first java	This book combines puzzles, strong visuals, mysteries, and soul-searching interviews with famous Java objects to engage you in many different ways. It's fast, it's fun, and it's effective	3	Kathy Sierra	O'Reilly	2022	1100.0	Java	18-12-2023	No

Showing 1 to 4 of 4 entries

Previous | 1 | Next

- Permit/reject requested book

All Requested Books

Book Name	Description	Edition	Author	Published By	Published On	Price	Category	Requested On	Requested By
head first java	This book combines puzzles, strong visuals, mysteries, and soul-searching interviews with famous Java objects to engage you in many different ways. It's fast, it's fun, and it's effective	3	Kathy Sierra	O'Reilly	2022	1100.0	Java	18-12-2023	Mansi Modi ✓ ✗

- Status of requested book before permit/reject

All Requested Books

Book Name	Description	Edition	Author	Published By	Published On	Price	Category	Requested On	Requested By
Ghosts of The Silent Hills	such as methods for handling unstructured data in a data warehouse and storing data across multiple storage media	3	Anita Krishan	Fingerprint! Publishing	2019	590.0	Horror	13-12-2023	Jigar Patel Rejected
SQL All-in-One For Dummies	Do not walk alone after sunset in the hills. A beautiful woman in white haunts the Lonely pathways, looking to enchant and ensnare men...	3	Allen G. Taylor	For Dummies	2019	800.0	RDBMS	14-12-2023	Jigar Patel Arrived
head first java	This book combines puzzles, strong visuals, mysteries, and soul-searching interviews with famous Java objects to engage you in many different ways. It's fast, it's fun, and it's effective	3	Kathy Sierra	O'Reilly	2022	1100.0	Java	18-12-2023	Mansi Modi Waiting

- Status of requested book after permit/reject

	data warehouse and storing data across multiple storage media										
Ghosts of The Silent Hills	Do not walk alone after sunset in the hills. A beautiful woman in white haunts the Lonely pathways, looking to enchant and ensnare men...	3	Anita Krishan	Fingerprint! Publishing	2019	590.0	Horror	13-12-2023	Jigar Patel	Rejected	
SQL All-in-One For Dummies	one-stop shop for everything you need to know about SQL and SQL-based relational databases	3	Allen G. Taylor	For Dummies	2019	800.0	RDBMS	14-12-2023	Jigar Patel	Arrived	
head first java	This book combines puzzles, strong visuals, mysteries, and soul-searching interviews with famous Java objects to engage you in many different ways. It's fast, it's fun, and it's effective	3	Kathy Sierra	O'Reilly	2022	1100.0	Java	18-12-2023	Mansi Modi	✓ Received	

	such as methods for handling unstructured data in a data warehouse and storing data across multiple storage media										
Ghosts of The Silent Hills	Do not walk alone after sunset in the hills. A beautiful woman in white haunts the Lonely pathways, looking to enchant and ensnare men...	3	Anita Krishan	Fingerprint! Publishing	2019	590.0	Horror	13-12-2023	Jigar Patel	Rejected	
SQL All-in-One For Dummies	one-stop shop for everything you need to know about SQL and SQL-based relational databases	3	Allen G. Taylor	For Dummies	2019	800.0	RDBMS	14-12-2023	Jigar Patel	Arrived	
head first java	This book combines puzzles, strong visuals, mysteries, and soul-searching interviews with famous Java objects to engage you in many different ways. It's fast, it's fun, and it's effective	3	Kathy Sierra	O'Reilly	2022	1100.0	Java	18-12-2023	Mansi Modi	Arrived	

All Requested Books

Show 10 entries

Search: Kathy

Book Name	Description	Edition	Author	Published By	Published On	Price	Category	Requested On	Arrived
head first java	This book combines puzzles, strong visuals, mysteries, and soul-searching interviews with famous Java objects to engage you in many different ways. It's fast, it's fun, and it's effective	3	Kathy Sierra	O'Reilly	2022	1100.0	Java	18-12-2023	Yes

Showing 1 to 1 of 1 entries (filtered from 4 total entries)

Previous | 1 | Next

Add Feedback

Feedback Message :

I have found all the needed books here.

Add

The screenshot shows a web application interface titled "Feedbacks". On the left, there is a sidebar with a dark background and white text, listing navigation options: Knowledge Gate, Most Issued Books, Newly Arrived Books, Employee List, Requested Books, Feedbacks, Roles, and Categories. The main content area has a light gray background. At the top, it says "Feedbacks" and includes a dropdown menu "Show 10 entries" and a search bar. Below this is a table with three columns: "Feedback", "Date", and "Student". A single row is displayed: "I have found all the needed books here.", dated "18-12-2023", and attributed to "Mansi Modi". At the bottom of the content area, it says "Showing 1 to 1 of 1 entries" and includes navigation buttons for "Previous", "1", and "Next". The browser's address bar shows "localhost:8035/getfeedbacks". The system tray at the bottom right indicates the date as 18-12-2023 and the time as 00:44.

The screenshot shows a web application interface titled "Roles". The layout is similar to the previous one, with a sidebar on the left and a main content area on the right. The sidebar lists the same navigation options as the first screenshot. The main content area has a light gray background. It displays a table with a single column labeled "Role". Three rows are listed: "ADMIN", "EMPLOYEE", and "STUDENT". Each row has two buttons to its right: a blue "Edit" button and a red "Delete" button. At the top of the content area, it says "Roles". In the top right corner of the content area, there is a blue button with a plus sign and the text "+ Add New Role". The browser's address bar shows "localhost:8035/getAllRole". The system tray at the bottom right indicates the date as 18-12-2023 and the time as 00:44.

The screenshot shows a web application interface titled "Knowledge Gate". On the left, there is a sidebar with icons and links for "Most Issued Books", "Newly Arrived Books", "Employee List", "Requested Books", "Feedbacks", "Roles", and "Categories". The main content area is titled "Categories" and displays a table with the following data:

Category		
Science Fiction	Edit	Delete
Mystery	Edit	Delete
Horror	Edit	Delete
Computer Networks	Edit	Delete
Java	Edit	Delete
C / C++	Edit	Delete
.NET core	Edit	Delete
Business Intelligence	Edit	Delete
RDBMS	Edit	Delete

A blue button at the top right says "+ Add Category". The browser address bar shows "localhost:8035/getallcategories". The system tray at the bottom indicates it's 00:44 on 18-12-2023.

This screenshot shows the same web application after a new category has been added. The table now includes an additional row for "CG".

Category		
Science Fiction	Edit	Delete
Mystery	Edit	Delete
Horror	Edit	Delete
Computer Networks	Edit	Delete
Java	Edit	Delete
C / C++	Edit	Delete
.NET core	Edit	Delete
Business Intelligence	Edit	Delete
RDBMS	Edit	Delete
CG	Edit	Delete

The rest of the interface and system status are identical to the first screenshot.

The screenshot shows a web application titled "Knowledge Gate" with a dark theme. On the left is a sidebar with icons for "Issue Books", "Books", "Student List", "Requested Books", and "Categories". The main content area is titled "Issued Books" and displays a table of issued books. The table has columns: Book ID, Book Name, User ID, Student Name, Issued Date, and Expected Return Date. The "Expected Return Date" column contains the text "Returned" for all rows. The table data is as follows:

Book ID	Book Name	User ID	Student Name	Issued Date	Expected Return Date
5	ASP.NET 4.5 Black Book	2	Mansi Modi	04-12-2023	Returned
7	Building the Data Warehouse	4	Jigar Patel	15-12-2023	Returned
4	Java 8 Programming Black Book	4	Jigar Patel	15-12-2023	Returned
1	PROGRAMMING IN ANSI C	4	Jigar Patel	15-12-2023	Returned

A blue button labeled "+ Issue Book" is located in the top right corner of the main content area. The browser's address bar shows "localhost:8035/getissuedbooks". The taskbar at the bottom includes icons for File Explorer, Task View, Start, Search, Taskbar settings, and several pinned applications.

The screenshot shows a web application titled "Knowledge Gate" with a dark theme. On the left is a sidebar with icons for "Currently Issued Books", "Issued Books History", "Available Books", "Requested Books", and "Feedback". The main content area is titled "Currently Issued Books" and displays a table of issued books. The table has columns: Book Name, Description, Edition, Author, Published By, Published On, Price, and Category. The table data is as follows:

Book Name	Description	Edition	Author	Published By	Published On	Price	Category
ASP.NET 4.5 Black Book	ASP.NET 4.5 Black Book is the one-time reference book, written from the programmer's point of view, containing hundreds of examples and covering nearly every aspect of ASP.NET 4.5 in both VB and C#.	5	Kogent Learning Solutions Inc.	Dreamtech Press	2013	600.0	.NET core

Below the table, a message says "Showing 1 to 1 of 1 entries". At the bottom right are buttons for "Previous", "1", and "Next". The browser's address bar shows "localhost:8035/getissuedbyid". The taskbar at the bottom includes icons for File Explorer, Task View, Start, Search, Taskbar settings, and several pinned applications.

● Issue Book

The screenshot shows the 'Issue Book' page from a web application. On the left, a sidebar titled 'Knowledge Gate' lists navigation options: Issue Books, Books, Student List, Requested Books, and Categories. The main content area has a title 'Issue Book'. On the left side of the content area, there is a form for a book with fields: Book ID (5), Book Name (ASP.NET 4.5 Black Book), Description (ASP.NET 4.5 Black Book is the one-time reference book, written from the programmer's point of view.), Edition (5), Author (Kogent Learning Solutions Inc.), Published By (Dreamtech Press), Published Year (2013), and Price (600.0). A red message 'Book is already issued!' is displayed above the book name field. On the right side, there is a form for a user with fields: User ID (2), First Name (Mansi), Last Name (Modi), Email ID (mansim383@gmail.com), Phone Number (9663215487), Address (Adajan, Surat), and Return Date (25/12/2023, 00:47). A blue 'Issue' button is located at the bottom of the left form.

The screenshot shows the 'Issue Book' page from a web application. The sidebar and overall layout are identical to the previous screenshot. The left form for the book has Book ID (6), Book Name (Object-Oriented Programming with C#), Description (The new edition helps students to assess their learning by answering questions based on learning), Edition (8), Author (E Balagurusamy), Published By (McGraw Hill Education), Published Year (2020), and Price (650.0). A red message 'Book is not permitted to purchase yet!' is displayed above the book name field. The right user form is identical to the previous screenshot, showing User ID (2), First Name (Mansi), Last Name (Modi), Email ID (mansim383@gmail.com), Phone Number (9663215487), Address (Adajan, Surat), and Return Date (25/12/2023, 00:47). The blue 'Issue' button is at the bottom of the left form.

localhost:8035/issuebook

Issue Book

Either Book details or User details are not valid!

Book ID	6	User ID	2
Search		Search	
Book is not permitted to purchase yet!			
Book Name	Object-Oriented Programming with C++		
The new edition helps students to assess their learning by answering questions based on learning			
Edition	8	First Name	Mansi
Author	E Balagurusamy	Last Name	Modi
Published By	McGraw Hill Education	Email ID	mansim383@gmail.com
Published Year	2020	Phone Number	9663215487
Price	650.0	Address	Adajan, Surat
Return Date 25/12/2023, 00:48			
Issue			

localhost:8035/getdetailsbyid/8/2

Issue Book

Book ID	8	User ID	2
Search		Search	
Book Name	Building the Data Warehouse		
to explaining the fundamentals of data warehouse systems, the book covers new topics such as methods			
Description			
Edition	4	First Name	Mansi
Author	W. H. Inmon	Last Name	Modi
Published By	Wiley	Email ID	mansim383@gmail.com
Published Year	2005	Phone Number	9663215487
Price	3500.0	Address	Adajan, Surat
Return Date 25/12/2023, 00:48			
Issue			

The screenshot shows a web application titled 'Knowledge Gate' with a dark sidebar menu. The main content area is titled 'Issued Books' and displays a table of issued books. The table columns are: Book ID, Book Name, User ID, Student Name, Issued Date, Expected Return Date, and Status (Returned). The data in the table is as follows:

Book ID	Book Name	User ID	Student Name	Issued Date	Expected Return Date	Status
5	ASP.NET 4.5 Black Book	2	Mansi Modi	04-12-2023	17-12-2023	Returned
7	Building the Data Warehouse	4	Jigar Patel	15-12-2023	22-12-2023	Returned
4	Java 8 Programming Black Book	4	Jigar Patel	15-12-2023	22-12-2023	Returned
1	PROGRAMMING IN ANSI C	4	Jigar Patel	15-12-2023	22-12-2023	Returned
8	Building the Data Warehouse	2	Mansi Modi	18-12-2023	25-12-2023	Returned

A blue button labeled '+ Issue Book' is located at the top right of the table. The user profile picture of 'jaimin Bhatt' is visible in the top right corner.

The screenshot shows a web application titled 'Knowledge Gate' with a dark sidebar menu. The main content area is titled 'Currently Issued Books' and displays a table of currently issued books. The table columns are: Book Name, Description, Edition, Author, Published By, Published On, Price, and Category. The data in the table is as follows:

Book Name	Description	Edition	Author	Published By	Published On	Price	Category
ASP.NET 4.5 Black Book	ASP.NET 4.5 Black Book is the one-time reference book, written from the programmer's point of view, containing hundreds of examples and covering nearly every aspect of ASP.NET 4.5 in both VB and C#.	5	Kogent Learning Solutions Inc.	Dreamtech Press	2013	600.0	.NET core
Building the Data Warehouse	to explaining the fundamentals of data warehouse systems, the book covers new topics such as methods for handling unstructured data in a data warehouse and storing data across multiple storage media	4	W. H. Inmon	Wiley	2005	3500.0	Business Intelligence

Below the table, it says 'Showing 1 to 2 of 2 entries'. At the bottom right, there are buttons for 'Previous', '1', and 'Next'.

Knowledge Gate

Currently Issued Books

Issued Books History

Available Books

Requested Books

Feedback

Currently Issued Books

Show 10 entries

Search: W

Book Name	Description	Edition	Author	Published By	Published On	Price	Category
Building the Data Warehouse	Explaining the fundamentals of data warehouse systems, the book covers new topics such as methods for handling unstructured data in a data warehouse and storing data across multiple storage media	4	W. H. Inmon	Wiley	2005	3500.0	Business Intelligence

Showing 1 to 1 of 1 entries (filtered from 2 total entries)

Previous 1 Next

Knowledge Gate

Issue Books

Books

Student List

Requested Books

Categories

Issued Books

+ Issue Book

Book ID	Book Name	User ID	Student Name	Issued Date	Expected Return Date	Action
5	ASP.NET 4.5 Black Book	2	Mansi Modi	04-12-2023	17-12-2023	Returned
7	Building the Data Warehouse	4	Jigar Patel	15-12-2023	22-12-2023	Returned
4	Java 8 Programming Black Book	4	Jigar Patel	15-12-2023	22-12-2023	Returned
1	PROGRAMMING IN ANSI C	4	Jigar Patel	15-12-2023	22-12-2023	Returned
8	Building the Data Warehouse	2	Mansi Modi	18-12-2023	25-12-2023	Returned

The screenshot shows a web application titled "Knowledge Gate" with a dark theme. On the left, a sidebar menu includes "Issue Books", "Books", "Student List", "Requested Books", and "Categories". The main content area is titled "Issued Books" and displays a table with the following data:

Book ID	Book Name	User ID	Student Name	Issued Date	Expected Return Date	Action
7	Building the Data Warehouse	4	Jigar Patel	15-12-2023	22-12-2023	Returned
4	Java 8 Programming Black Book	4	Jigar Patel	15-12-2023	22-12-2023	Returned
1	PROGRAMMING IN ANSI C	4	Jigar Patel	15-12-2023	22-12-2023	Returned
8	Building the Data Warehouse	2	Mansi Modi	18-12-2023	25-12-2023	Returned

A blue button at the top right says "+ Issue Book". The top navigation bar shows the URL "localhost:8035/getissuedbooks". The taskbar at the bottom includes icons for various applications like Microsoft Teams, Oracle ALTER TABLE, Learn Basic CSS, Sample PL/SQL Pro, efficiently finding p..., material of db, and pl/sql real 100% ma...".

The screenshot shows a web application titled "Knowledge Gate" with a dark theme. On the left, a sidebar menu includes "Currently Issued Books", "Issued Books History", "Available Books", "Requested Books", and "Feedback". The main content area is titled "Issued Books History" and displays a table with the following data:

Book Name	Description	Edition	Author	Published By	Published On	Price	Category
Let Us C	The new edition of this classic book has been thoroughly revamped but remains faithful to the principles that have established it as a favourite amongst students, teachers and software professionals round the world	19	Yashvant Kanetkar	BPB Publications	2022	900.0	C / C++
ASP.NET 4.5 Black Book	ASP.NET 4.5 Black Book is the one-time reference book, written from the programmer's point of view, containing hundreds of examples and covering nearly every aspect of ASP.NET 4.5 in both VB and C#.	5	Kogent Learning Solutions Inc.	Dreamtech Press	2013	600.0	.NET core

Below the table, a message says "Showing 1 to 2 of 2 entries". At the bottom right, there are "Previous" and "Next" buttons. The top navigation bar shows the URL "localhost:8035/getissuedhistorybyid". The taskbar at the bottom includes icons for various applications like Microsoft Teams, Oracle ALTER TABLE, Learn Basic CSS, Sample PL/SQL Pro, efficiently finding p..., material of db, and pl/sql real 100% ma...".

Knowledge Gate

- Currently Issued Books
- Issued Books History
- Available Books
- Requested Books
- Feedback

Currently Issued Books

Show 10 entries

Book Name	Description	Edition	Author	Published By	Published On	Price	Category
Building the Data Warehouse	Explaining the fundamentals of data warehouse systems, the book covers new topics such as methods for handling unstructured data in a data warehouse and storing data across multiple storage media	4	W. H. Inmon	Wiley	2005	3500.0	Business Intelligence

Showing 1 to 1 of 1 entries

Previous 1 Next

Knowledge Gate

- Issue Books
- Books
- Student List
- Requested Books
- Categories

Books

+ Add Book

Book Name	Description	Edition	Author	Published By	Published On	Price	Category	
PROGRAMMING IN ANSI C	This book is so good for beginners who wants to learn C	8	E Balagurusamy	McGraw Hill Education	2019	700.0	C / C++	<button>Edit</button> <button>Delete</button>
Let Us C	The new edition of this classic book has been thoroughly revamped but remains faithful to the principles that have established it as a favourite amongst students, teachers and software professionals round the world	19	Yashwant Kanetkar	BPB Publications	2022	900.0	C / C++	<button>Edit</button> <button>Delete</button>
Programming with Java	Retaining its quintessential style of concept explanation with exhaustive programs, solved examples, and illustrations, this test takes the journey of understanding JAVA to slightly higher level	6	E Balagurusamy	McGraw Hill Education	2019	950.0	Java	<button>Edit</button> <button>Delete</button>
Java 8 Programming Black Book	Java 8 Black Book is a solid introductory reference that has been written from the experts' point of view and so includes hundreds of examples covering every feature of the	3	D.T. Editorial Services	Dreamtech Press	2015	950.0	Java	<button>Edit</button> <button>Delete</button>

localhost:8035/updatebook

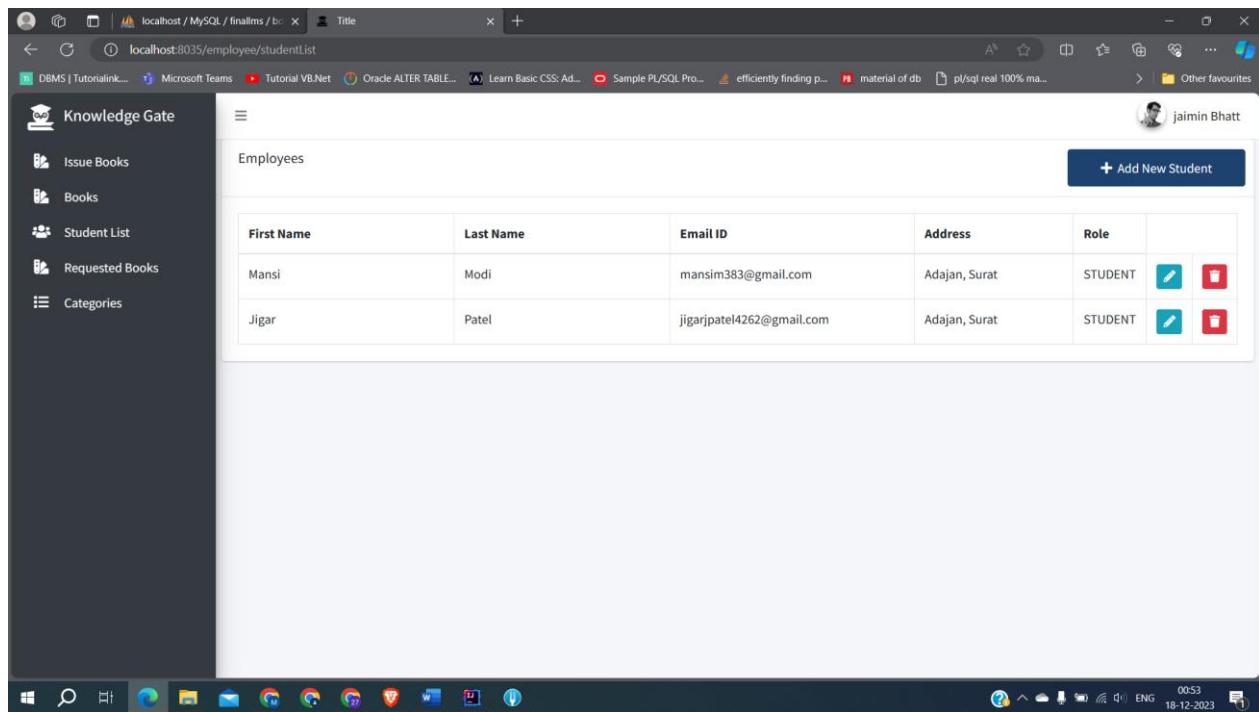
Update Book

Book Name :	Description :		
PROGRAMMING IN ANSI C	This book is so good for beginners who wants to learn C		
Edition :	Author :	Published By :	
8	E Balagurusamy	McGraw Hill Education	
Published Year :	Price :	Category :	
2019	1000.0	C / C++	
Update			

localhost:8035/getbooks

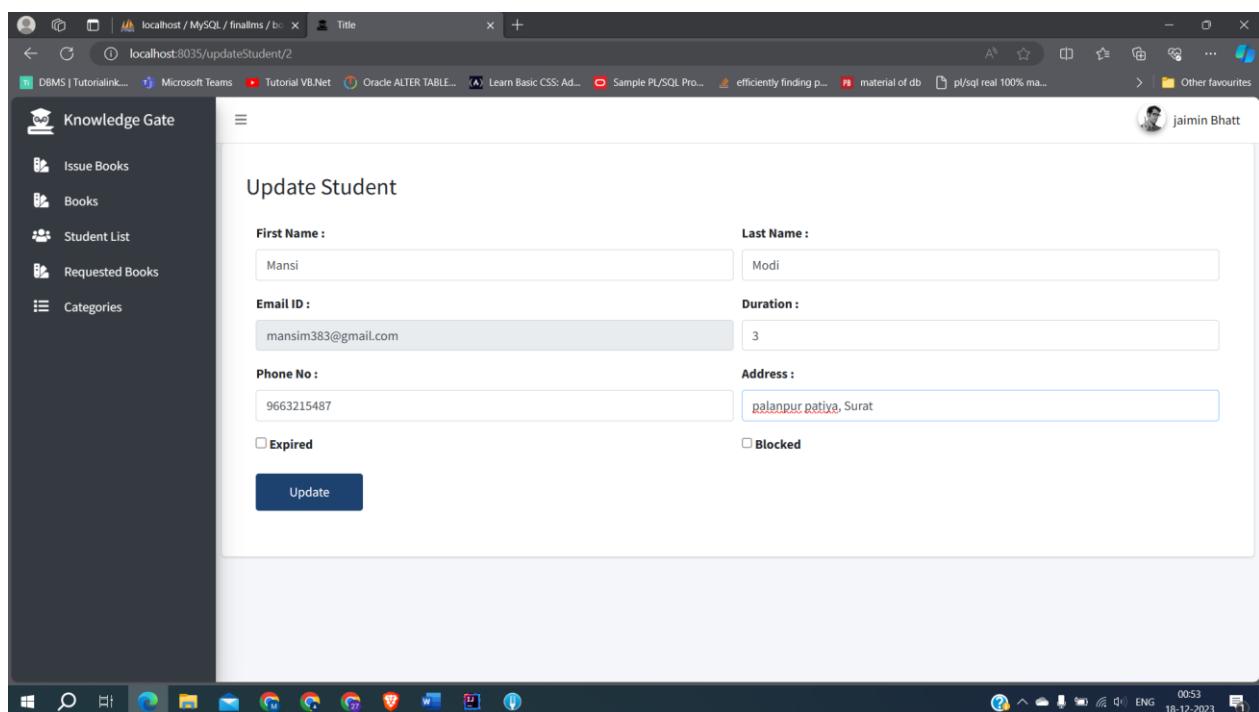
Books

Book Name	Description	Edition	Author	Published By	Published On	Price	Category	
PROGRAMMING IN ANSI C	This book is so good for beginners who wants to learn C	8	E Balagurusamy	McGraw Hill Education	2019	1000.0	C / C++	Edit Delete
Let Us C	The new edition of this classic book has been thoroughly revamped but remains faithful to the principles that have established it as a favourite amongst students, teachers and software professionals round the world	19	Yashvant Kanetkar	BPB Publications	2022	900.0	C / C++	Edit Delete
Programming with Java	Retaining its quintessential style of concept explanation with exhaustive programs, solved examples, and illustrations, this test takes the journey of understanding JAVA to slightly higher level	6	E Balagurusamy	McGraw Hill Education	2019	950.0	Java	Edit Delete
Java 8 Programming Black Book	Java 8 Black Book is a solid introductory reference that has been written from the experts' point of view and so includes hundreds of examples covering every feature of the	3	D.T. Editorial Services	Dreamtech Press	2015	950.0	Java	Edit Delete



The screenshot shows a web application interface titled "Knowledge Gate". On the left, there is a sidebar with icons for "Issue Books", "Books", "Student List", "Requested Books", and "Categories". The main content area displays a table titled "Employees" with two rows of data. The columns are "First Name", "Last Name", "Email ID", "Address", and "Role". The first row contains Mansi Modi, mansim383@gmail.com, Adajan, Surat, STUDENT. The second row contains Jigar Patel, jigarpatel4262@gmail.com, Adajan, Surat, STUDENT. Each row has edit and delete icons in the last column.

First Name	Last Name	Email ID	Address	Role	
Mansi	Modi	mansim383@gmail.com	Adajan, Surat	STUDENT	 
Jigar	Patel	jigarpatel4262@gmail.com	Adajan, Surat	STUDENT	 



The screenshot shows a web application interface titled "Knowledge Gate". On the left, there is a sidebar with icons for "Issue Books", "Books", "Student List", "Requested Books", and "Categories". The main content area displays a form titled "Update Student" with fields for "First Name", "Last Name", "Email ID", "Duration", "Phone No.", "Address", "Expired", and "Blocked". The "First Name" field contains Mansi, "Last Name" contains Modi, "Email ID" contains mansim383@gmail.com, "Duration" contains 3, "Phone No." contains 9663215487, "Address" contains palanpur patiya, Surat, and "Address" is highlighted in red. There are checkboxes for "Expired" and "Blocked". A blue "Update" button is at the bottom.

The screenshot shows a web application titled "Knowledge Gate" running on a Windows 10 desktop. The URL is localhost:8035/employee/studentList. The interface includes a sidebar with icons for Issue Books, Books, Student List, Requested Books, and Categories. The main content area displays a table of student records:

First Name	Last Name	Email ID	Address	Role	
Mansi	Modi	mansim383@gmail.com	palanpur patiya, Surat	STUDENT	
Jigar	Patel	jigarjpatel4262@gmail.com	Adajan, Surat	STUDENT	

A blue button at the top right says "+ Add New Student". The system tray shows the date as 18-12-2023 and time as 00:53.

The screenshot shows a web application titled "Knowledge Gate" running on a Windows 10 desktop. The URL is localhost:8035/getavailablebooks. The interface includes a sidebar with icons for Currently Issued Books, Issued Books History, Available Books, Requested Books, and Feedback. The main content area displays a table of available books:

Book Name	Description	Edition	Author	Published By	Published On	Price	Category
Let Us C	The new edition of this classic book has been thoroughly revamped but remains faithful to the principles that have established it as a favourite amongst students, teachers and software professionals round the world	19	Yashvant Kanetkar	BPB Publications	2022	900.0	C / C++
Programming with Java	Retaining its quintessential style of concept explanation with exhaustive programs, solved examples, and illustrations, this test takes the journey of understanding JAVA to slightly higher level	6	E Balagurusamy	McGraw Hill Education	2019	950.0	Java
ASP.NET 4.5 Black Book	ASP. NET 4. 5 Black Book is the one-time reference book, written from the programmer's point of view, containing hundreds of examples and covering nearly every aspect of ASP. NET 4. 5 in both VB and C#.	5	Kogent Learning Solutions Inc.	Dreamtech Press	2013	600.0	.NET core
SQL All-in-One For Dummies	one-stop shop for everything you need to know about SQL and SQL-based relational databases	3	Allen G. Taylor	For Dummies	2019	800.0	RDBMS
head first java	This book combines puzzles, strong visuals, mysteries, and soul-	3	Kathy Sierra	O'Reilly	2022	1100.0	Java

A search bar at the top right shows "Mansi Modi". The system tray shows the date as 18-12-2023 and time as 00:54.

Knowledge Gate

Currently Issued Books
Issued Books History
Available Books
Requested Books
Feedback

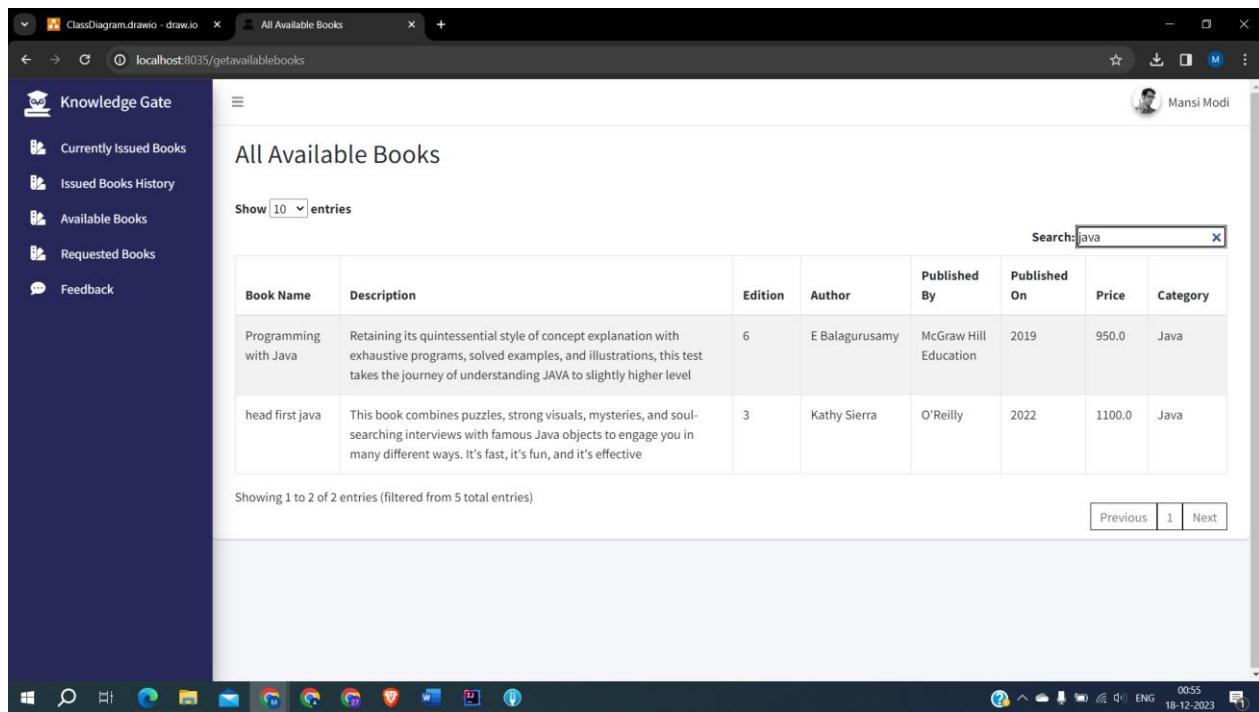
All Available Books

Show 10 entries

Book Name	Description	Edition	Author	Published By	Published On	Price	Category
Programming with Java	Retaining its quintessential style of concept explanation with exhaustive programs, solved examples, and illustrations, this test takes the journey of understanding JAVA to slightly higher level	6	E Balagurusamy	McGraw Hill Education	2019	950.0	Java
head first java	This book combines puzzles, strong visuals, mysteries, and soul-searching interviews with famous Java objects to engage you in many different ways. It's fast, it's fun, and it's effective	3	Kathy Sierra	O'Reilly	2022	1100.0	Java

Showing 1 to 2 of 2 entries (filtered from 5 total entries)

Previous 1 Next



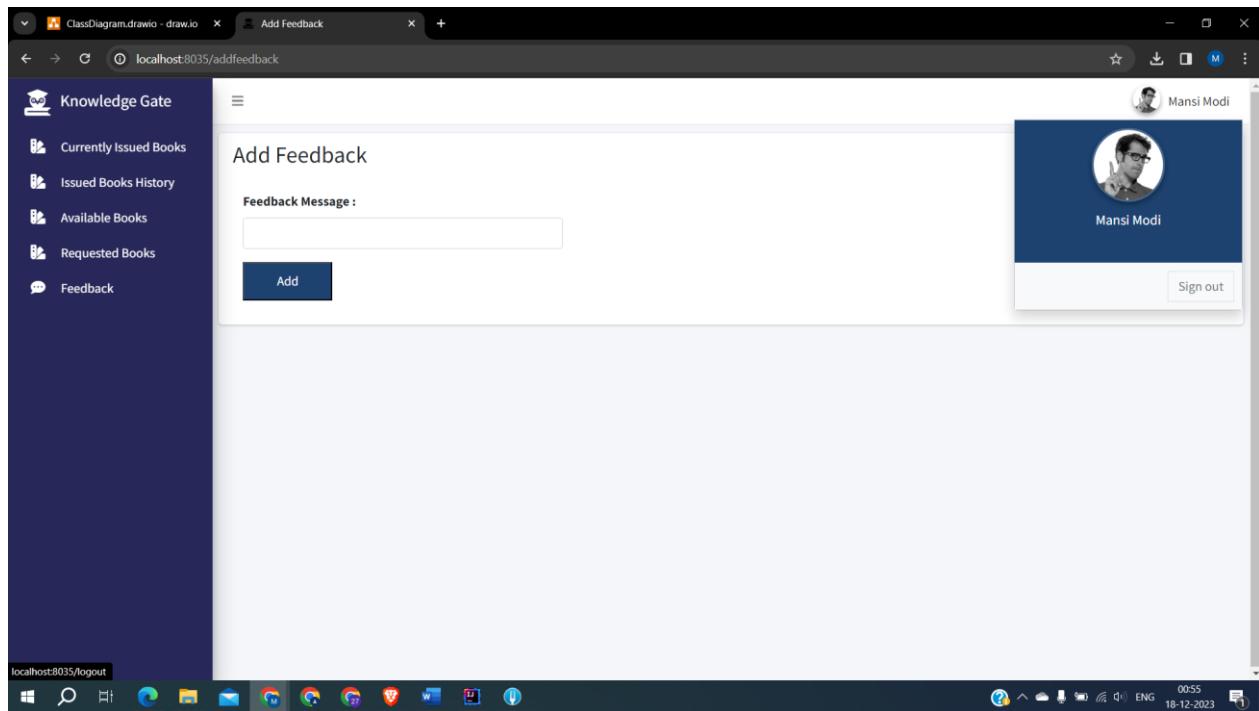
Knowledge Gate

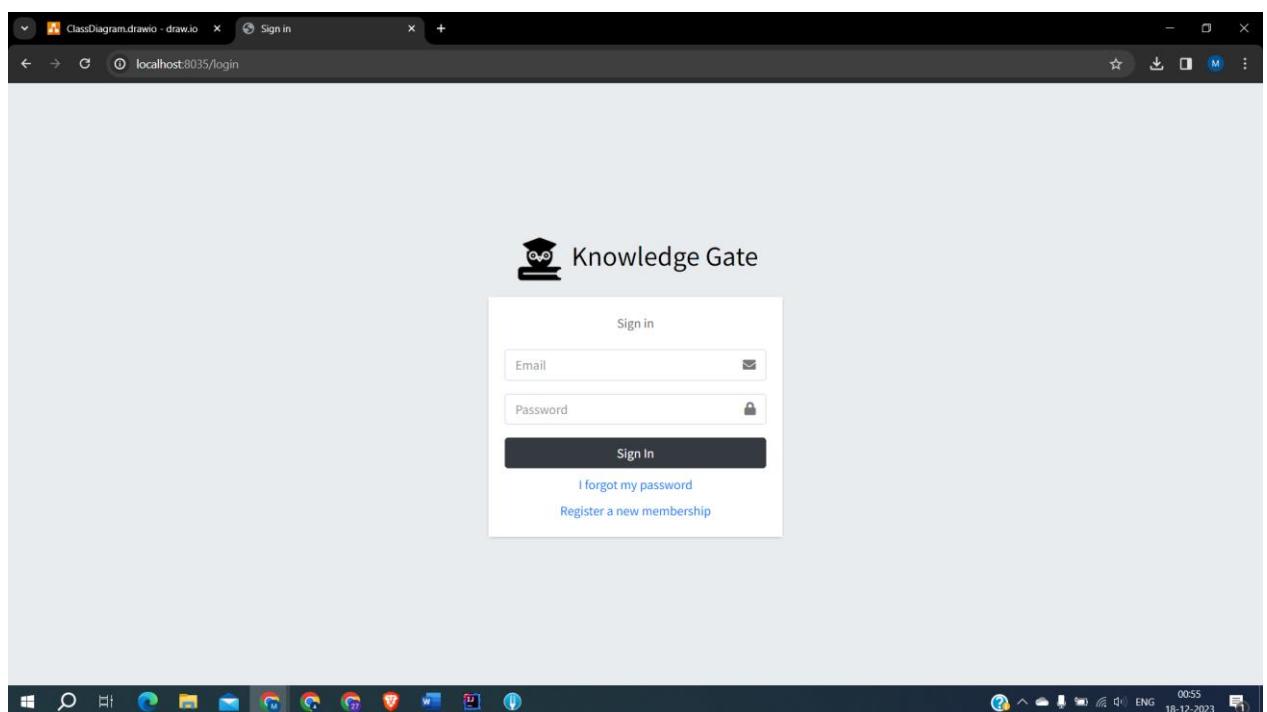
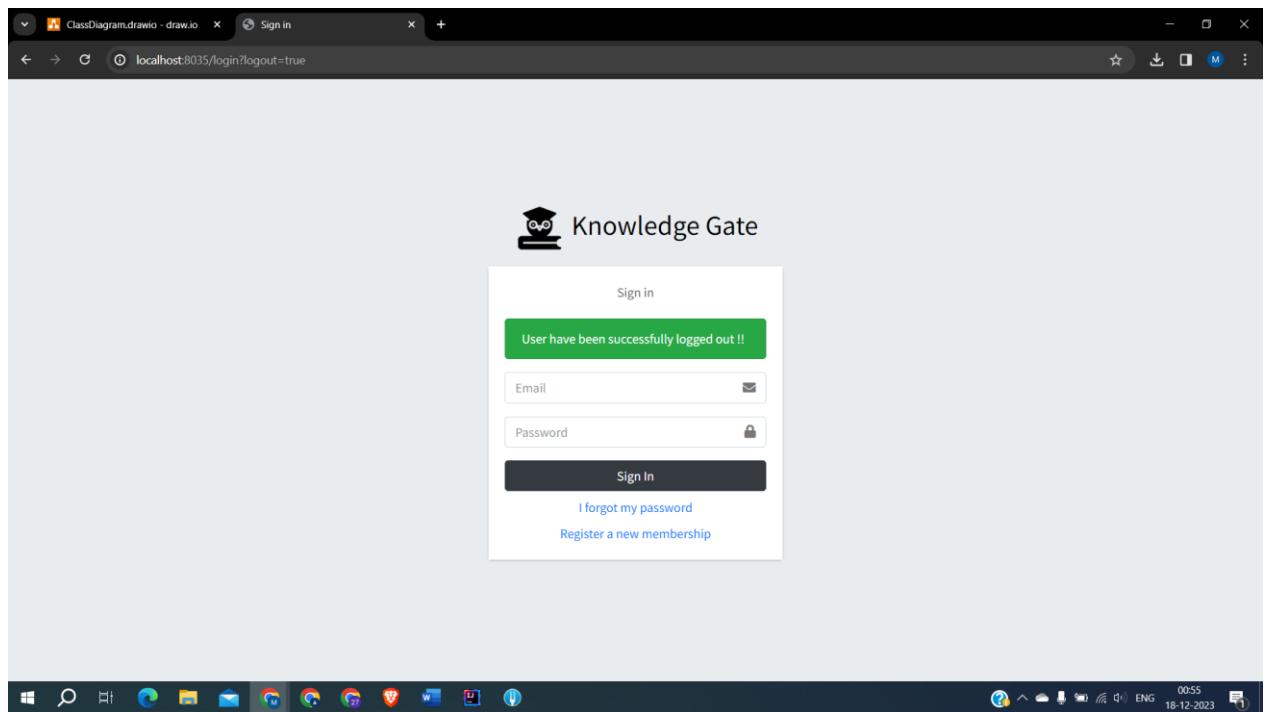
Currently Issued Books
Issued Books History
Available Books
Requested Books
Feedback

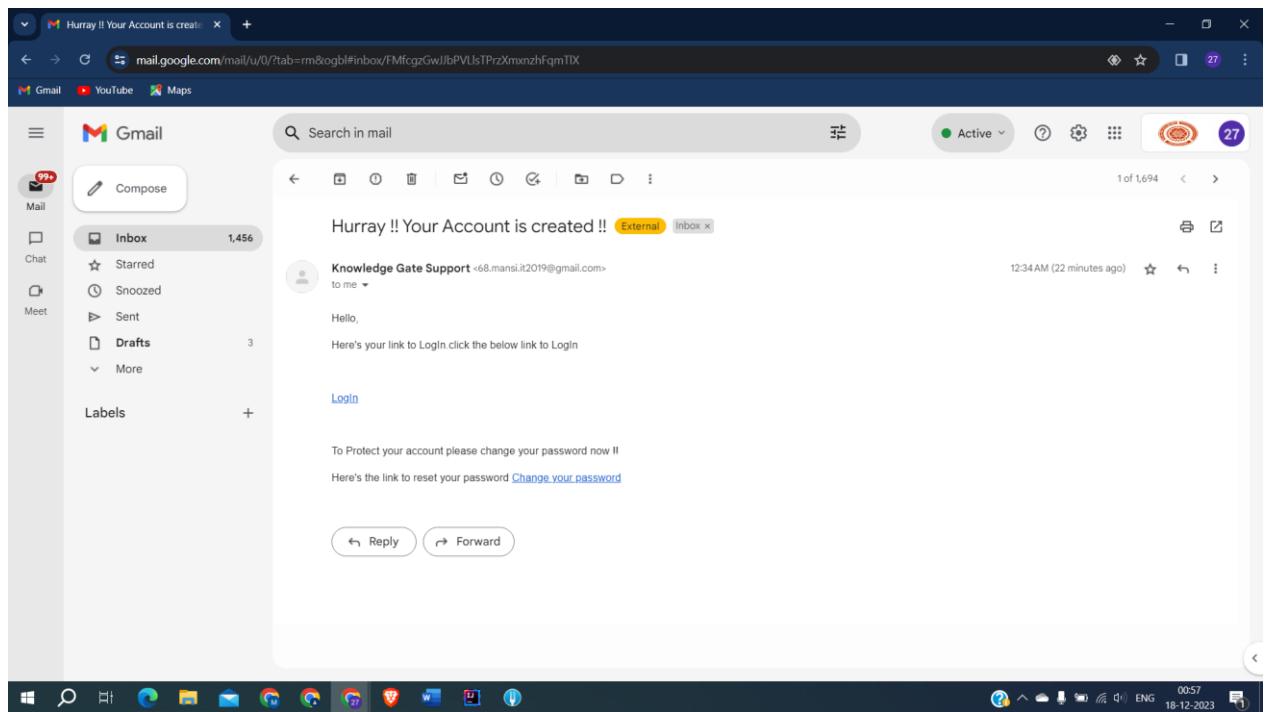
Add Feedback

Feedback Message :

Add







7. Testing

7.1 Unit Testing

Login Test Case

Test Case Name	Test login
Test Case Description	The objective of this test case is to verify the ‘login’
Prerequisites	User is authorized
Test Steps	Login to the application URL : http://localhost:8035/login
Test Data	<ul style="list-style-type: none">• Enter Invalid username.• Enter Invalid password.• Click on ‘login’ button.
Expected Result	‘Username and password are incorrect’ should get displayed if the username and password are not valid. The redirected link is http://localhost:8035/login?error=true
Actual Result	Error occur !! That saying Invalid username and password.
Status	Fail

Registration Test Case

Test Case Name	Test register
Test Case Description	The objective of this test case is to verify the ‘register’.
Prerequisites	User should know the Website URL.
Test Steps	Login to the application URL : http://localhost:8035/public/register
Test Data	<ul style="list-style-type: none">• Enter valid Data.• Enter unique email that not already exist.• Click on ‘Register’ button.
Expected Result	‘Register successful !!’ message displayed and

	The redirected link is http://localhost:8035/login
Actual Result	The login page displayed !!
Status	True

Issue Book Test Case

Test Case Name	Test Issue Book
Test Case Description	The objective of this test case is to check the ‘Issue Book’
Prerequisites	User is authorized
Test Steps	<ol style="list-style-type: none"> 1. select issued books tab from left sidebar. 2. Select issue book button from top-right side
Test Data	<ul style="list-style-type: none"> • Enter Book and Student ID • If you enter a book that is already issued than you are not allowed to issue that book, error message displayed on screen. • If you enter a student that has already issued 3 books or it's membership is blocked than you are not allowed to issue book to that student, error message displayed on screen.
Expected Result	Book is issued to particular student
Actual Result	Success !!
Status	True

Add User Test Case

Test Case Name	Test Add User
Test Case Description	The objective of this test case is to check the ‘Add User’
Prerequisites	User is authorized
Test Steps	<ol style="list-style-type: none">1. select a Students List tab from left sidebar.2. Select add user button from top-right side
Test Data	<ul style="list-style-type: none">• Enter Empty data.• Click on ‘Save’ button.
Expected Result	Add user page again displayed with error.
Actual Result	Error occur !!
Status	Fail

8. Future Enhancement

- Communication using chatbot between Employee and Admin
- Payment gateway Integration for Penalty Payment
- Use IOT Devices to issue book
- Make mobile application

9. References

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- <https://www.thymeleaf.org/>
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