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B. Tech. CE Semester –VI

Subject: SYSTEM DESIGN PRACTICE (CE-621)

Project Title: Library Management System

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CERTIFICATE

This is to certify that the project entitled “Library Management System” is a bonafide report of work carried out by

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Of the Department of Computer Engineering, Semester VI, under the guidance and supervision for the subject System Design Practice. They were involved in the Project during the academic year 2019-2020.

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Abstract

Manual process of keeping student records, book records, account details, managing employee is very difficult.

There are various problems also faced by the student in a 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 ISBN, etc.

To eliminate this manual system, library management system has been developed. Library Management System will handle all the current issues faced by the students and by its admin personnel.

Introduction

Purpose

Library Management System is a portal for efficient book management on behalf of the Ce department. It provides a graphical user interface that makes software interactive for both admin as well as the user.

Technology Used:

- ☐ Django
- ☐ Html
- ☐ Materialize Css
- ☐ Javascript

Tools Used:

- ☐ XAMPP Control Panel
- ☐ Git as VCS (Version Control System)
- ☐ Visual Studio Code as editor

Platform:

- ☐ Supported on all platform

Software Requirement Specification for

Library Management System

❖ List of Users:

1. Faculty
2. Student
3. Admin

❖ Functional Requirements

1. General Requirements:

R.1.1: Login:

Description: User Login with given id and password

Input: User Id and Password

Output: Show error if any or allows user to continue further

2. Admin

R.2.1: Manage Books

R.2.1.1: Add Book

Description: Admin can add Book

Input: Book details

Output: Message is shown.

R.2.1.2: Remove Books

Description: Admin can remove a book

Input: Book id

Output: Message is shown.

R.2.1.3: View issued Books

Description: Admin can see all the issued book

Input: Button click

Output: All issued books are shown.

R.2.2: Manage Issue Request

R.2.2.1: View Request

Description: Admin can see all the issue request for books

Input: Button click

Output: All Issue Request Are Shown

R.2.2.2: Accept Request

Description: Admin can accept an issue request

Input: Button click

Output: Book is issued successfully

R.2.2.3: Decline Request

Description: Admin can decline an issue request

Input: Button click

Output: Issue request is deleted

R.2.3: Manage Members

R.2.3.1: View Members

Description: Admin can see all the registered member

Input: Button click

Output: All Members Are Shown

R.2.3.2: Add a member

Description: Admin can add a member

Input: Details of the new member

Output: member is registered successfully

R.2.3.3: Remove a member

Description: Admin can remove a registered member

Input: Button click

Output: Member is unregistered

R.2.4: Manage Overdue and Issue Period

R.2.4.1: Change Issue Period

Description: Admin can change issue period of books

Input: New issue period

Output: Message is shown

R.2.4.2: Change Overdue Charge

Description: Admin can change the overdue charge

Input: New Value

Output: Message is Shown

R.2.4.3: Display charges for User

Description: Admin can see the list of user who have not returned book and can see late fee user need to pay

Input: Button click

Output: List is shown

R.2.4.3: Display charges for User

Description: Admin can see the list of user who have not returned book and can see late fee user need to pay

Input: Button click

Output: List is shown

R.2.4.3: Notify

Description: Admin can notify user of late submission and overdue fees.

Input: Button click

Output: Message is shown

3. **Faculty**

R.3.1: Issuing

R.3.1.1: Search Book

Description: user can search a book

Input: book name / Publisher Name/ Title

Output: List is shown

R.3.1.2: Issue Request

Description: user can request for issuing a book

Input: button click

Output: Message is Shown

R.3.1.3: Cancel issue Request

Description: User can cancel their issue request

Input: Button click

Output: Message is shown

R.3.1.4: View issued books

Description: User can see all books issued by him/her

Input: Button click

Output: List is shown

R.3.2: Manage Details

R.3.2.1: Change Password

Description: user change his/her Password

Input: new password

Output: message is shown

4. **Student**

R.4.1: **Issuing**

R.4.1.1: Search Book

Description: user can search a book

Input: book name / Publisher Name/ Title

Output: List is shown

R.4.1.2: Issue Request

Description: user can request for issuing a book

Input: button click

Output: Message is Shown

R.4.1.3: Cancel issue Request

Description: User can cancel their issue request

Input: Button click

Output: Message is shown

R.4.1.4: View issued books

Description: User can see all books issued by him/her

Input: Button click

Output: List is shown

R.4.1: **Manage Details**

R.4.2.1: Change Password

Description: user change his/her Password

Input: new password

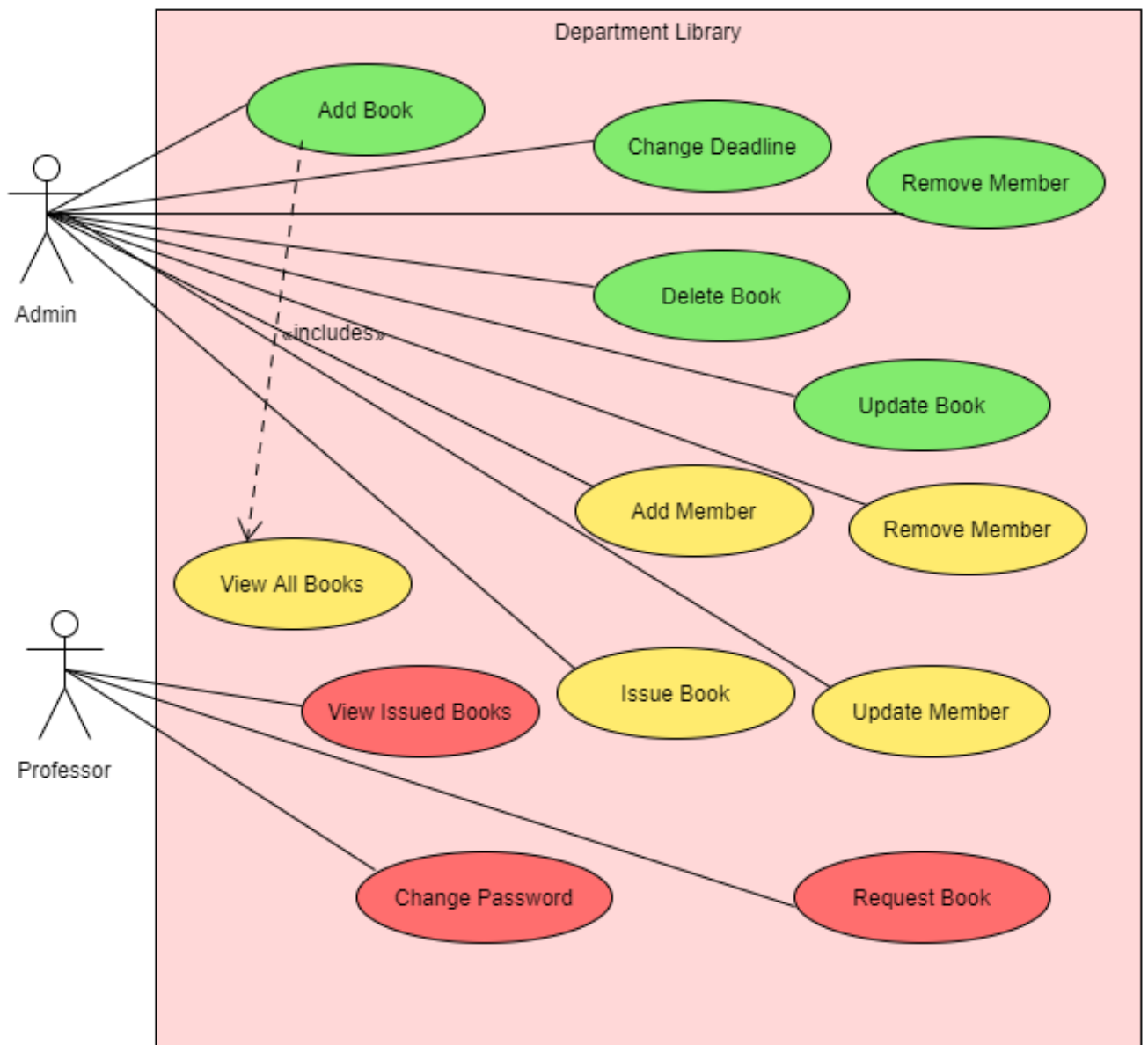
Output: message is shown

❖ **Non-functional Requirements:**

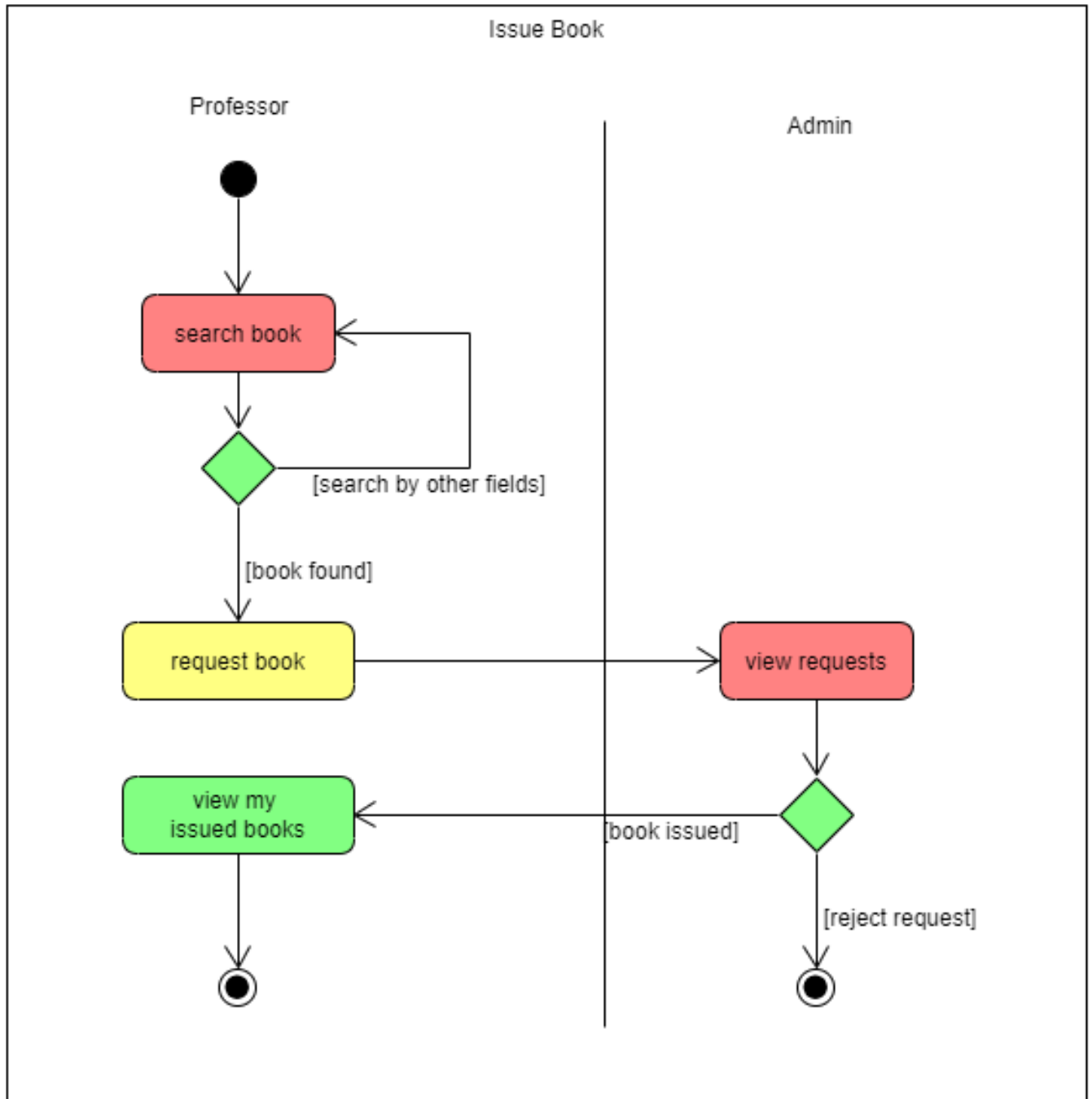
- Secure access of confidential data (user's details).
- 24 X 7 availability
- Better component design to get better performance at peak time
- Flexible service based architecture will be highly desirable for future extension

Design

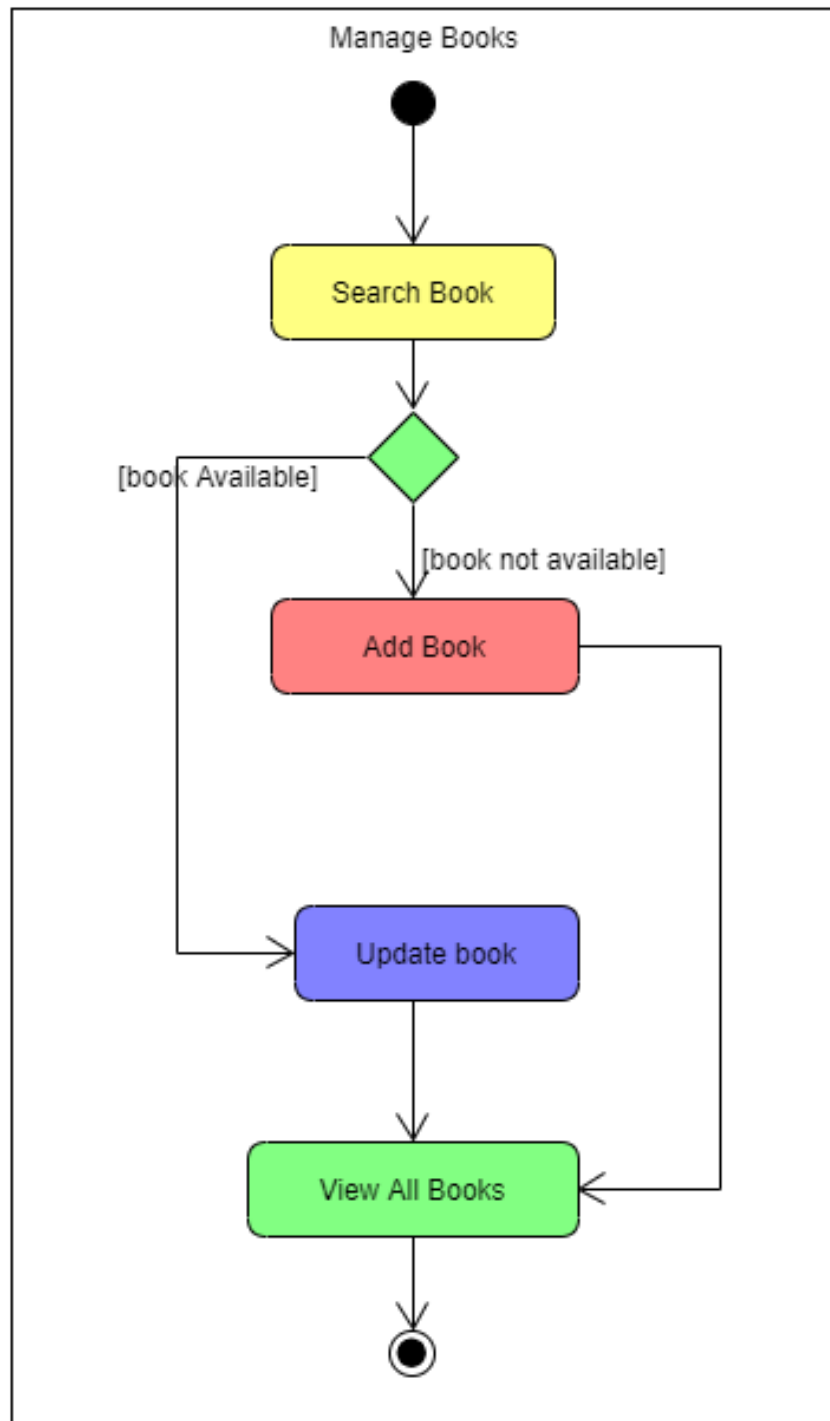
I. Use Case



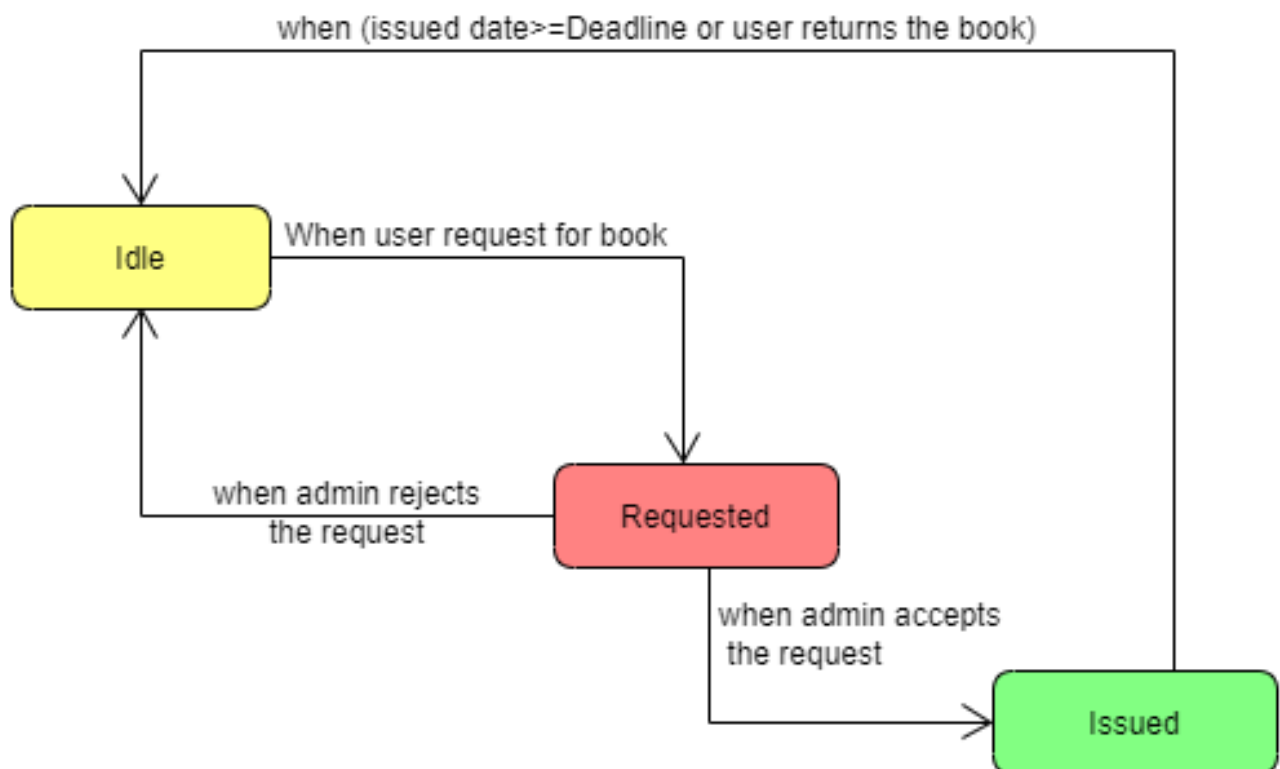
II. Sequence Diagram



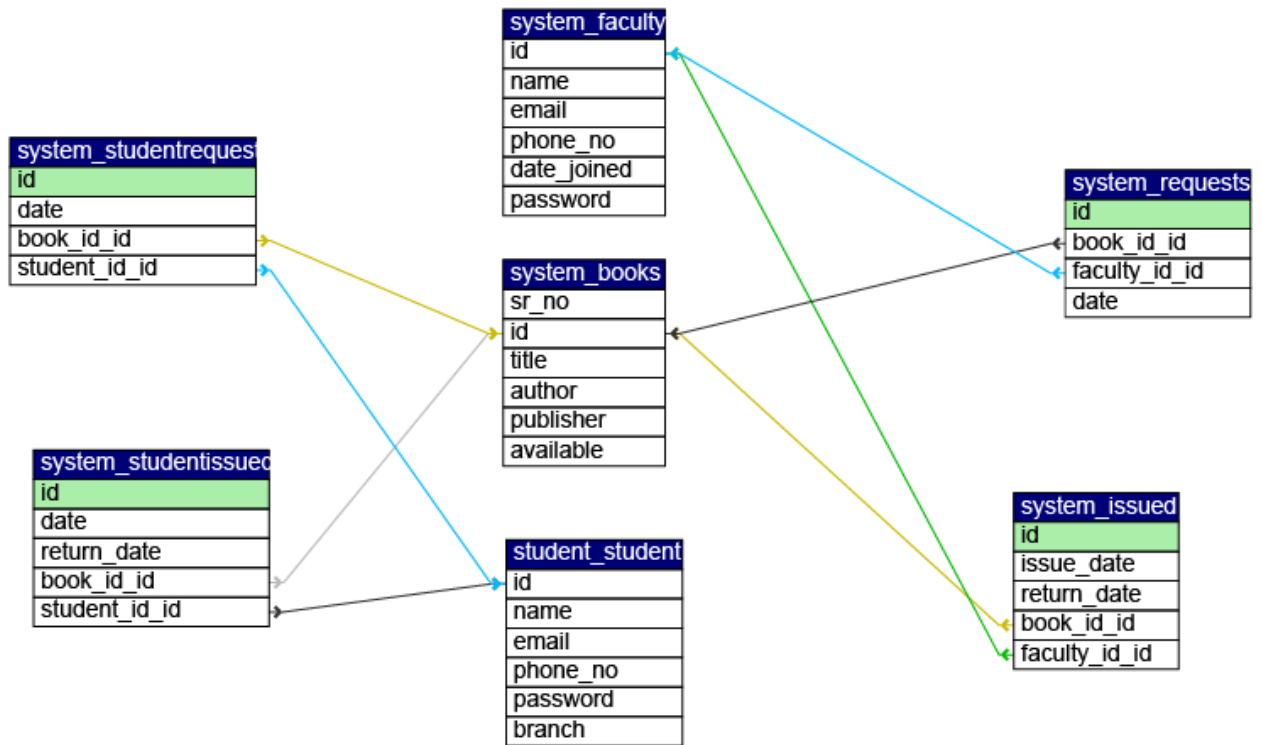
III. Activity Diagram



IV. State Diagram



V. E-R Diagram



VI. Data Dictionary

BOOKS Table

Sr.No	Field Name	Data Type	Width	Required	Unique	PK/FK	Reference Table	Description
1	Sr_no	Int	4	yes	Yes	PK	-	Numbering for Books
2	Id	varchar	100	yes	Yes	-	-	Unique ID for Books
3	Title	Varchar	100	Yes	No	-	-	Title of Book
4	Author	Varchar	100	Yes	No	-	-	Author of the Book
5	Publisher	Varchar	100	Yes	No	-	-	Publisher of Book
6	Available	Int	10	Yes	NO	-	-	Boolean flag for denoting issued or not

Faculty Table

Sr.No	Field Name	Data Type	Width	Required	Unique	PK/FK	Reference Table	Description
1	Id	Varchar	100	yes	yes	PK	-	Faculty id
2	Name	Varchar	100	yes	No	-	-	Faculty Name
3	Email	Varchar	100	Yes	No	-	-	Email address
4	Phone Number	Int	10	Yes	No	-	-	Phone Number
5	Date Joined	Date	100	Yes	No	-	-	Date of Joining
6	Password	Varchar	10	Yes	No	-	-	-

Student Table

Sr.No	Field Name	Data Type	Width	Required	Unique	PK/FK	Reference Table	Description
1	Id	Varchar	100	yes	yes	PK	-	Student id
2	Name	Varchar	100	yes	No	-	-	Student Name
3	Email	Varchar	100	Yes	No	-	-	Email address
4	Phone Number	Int	10	Yes	No	-	-	Phone Number
5	Branch	Varchar	100	Yes	No	-	-	Branch of Student
6	Password	Varchar	10	Yes	No	-	-	-

Faculty Issue Table

Sr.No	Field Name	Data Type	Width	Required	Unique	PK/FK	Reference Table	Description
1	Id	Int	4	yes	Yes	PK	-	id
2	Issue-Date	Date	4	Yes	yes	-	-	-
3	Return-Date	Date	4	Yes	Yes	-	-	-
4	Book_id_id	Varchar	5	Yes	No	FK	Books Table	Id of the Book
5	Faculty_id_id	Varchar	10	Yes	No	FK	Faculty Table	Id of the Faculty

Faculty Request Table

Sr.No	Field Name	Data Type	Width	Required	Unique	PK/FK	Reference Table	Description
1	Id	Int	4	yes	Yes	PK	-	id
2	Date	Date	4	Yes	yes	-	-	-
3	Book_id_id	Varchar	5	Yes	No	FK	Books Table	Id of the Book
4	Faculty_id_id	Varchar	10	Yes	No	FK	Faculty Table	Id of the Faculty

Student Issue Table

Sr.No	Field Name	Data Type	Width	Required	Unique	PK/FK	Reference Table	Description
1	Id	Int	4	yes	Yes	PK	-	id
2	Issue-Date	Date	4	Yes	yes	-	-	-
3	Return-Date	Date	4	Yes	Yes	-	-	-
4	Book_id_id	Varchar	5	Yes	No	FK	Books Table	Id of the Book
5	Student_id_id	Varchar	10	Yes	No	FK	Student Table	Id of the Student

Student Request Table

Sr.No	Field Name	Data Type	Width	Required	Unique	PK/FK	Reference Table	Description
1	Id	Int	4	yes	Yes	PK	-	id
2	Date	Date	4	Yes	yes	-	-	-
3	Book_id_id	Varchar	5	Yes	No	FK	Books Table	Id of the Book
4	Student_id_id	Varchar	10	Yes	No	FK	Student Table	Id of the Student

Implementation Details

- Implementation of all apps follows:
 - MVC (Model View Controller)
- Almost all of the codebase follows the **SOLID Principle**.
- MySQL database used for database query that is Relational DBMS(RDBMS).
- To Design All of the UI Html, Materialize CSS and JavaScript is used throughout the project
- Users of this system are Admin, Faculty, and Student.
 - To manage users, while registering it the system assigns roles to users as per their input.
 - Next time at login time, Django Session comes to picture and it will show content according to the user.
 - Overdue Fines are visible to user accordingly.
 - Only Admin is able to add a book, faculty or student.

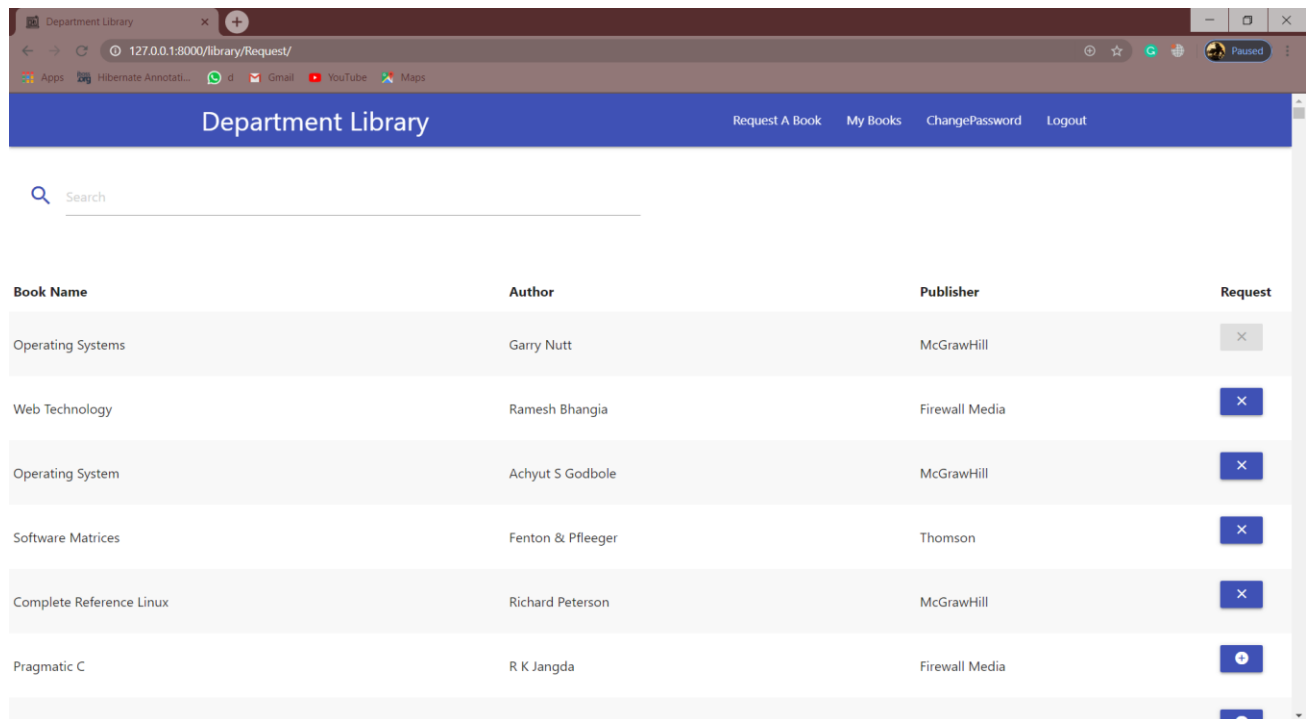
Screenshot



Welcome!

A login form with a light gray background. At the top, the word "Login" is centered in a blue font. Below it, there are two input fields: the first is labeled "Username" with a blue person icon to its left, and the second is labeled "password" with a blue key icon to its left. Below these fields is a CAPTCHA section with a checkbox labeled "I'm not a robot" and a blue circular arrow icon with the text "reCAPTCHA Privacy - Terms" below it. At the bottom of the form is a purple button with the text "LOGIN" in white and a small blue arrow pointing to the right.

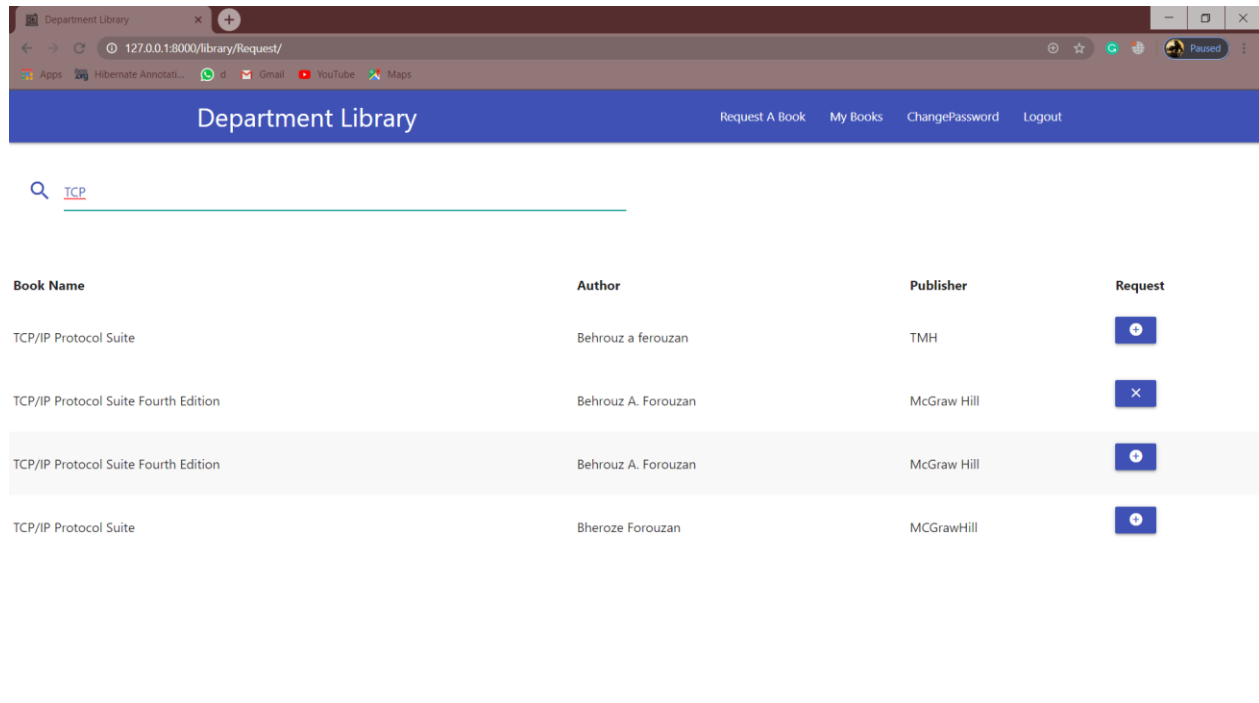
I) logging page



The screenshot shows a web browser window with the URL 127.0.0.1:8000/library/Request/. The page has a blue header with the title "Department Library" and navigation links: "Request A Book", "My Books", "ChangePassword", and "Logout". Below the header is a search bar with a magnifying glass icon and the word "Search". The main content area displays a table of books with columns for "Book Name", "Author", "Publisher", and "Request".

Book Name	Author	Publisher	Request
Operating Systems	Garry Nutt	McGrawHill	
Web Technology	Ramesh Bhangia	Firewall Media	
Operating System	Achyut S Godbole	McGrawHill	
Software Matrices	Fenton & Pflieger	Thomson	
Complete Reference Linux	Richard Peterson	McGrawHill	
Pragmatic C	R K Jangda	Firewall Media	

II) Faculty/Student Homepage



The screenshot shows the same Department Library homepage, but with the search bar containing the text "TCP". The table below displays the search results for "TCP".

Book Name	Author	Publisher	Request
TCP/IP Protocol Suite	Behrouz a ferouzan	TMH	
TCP/IP Protocol Suite Fourth Edition	Behrouz A. Forouzan	McGraw Hill	
TCP/IP Protocol Suite Fourth Edition	Behrouz A. Forouzan	McGraw Hill	
TCP/IP Protocol Suite	Bheroze Forouzan	McGrawHill	

III) Search Book

Department Library

Request A Book My Books ChangePassword Logout

Press Password Icon To Show Or Hide Password

Change password

Old Password

New Password

Confirm Password

LOGIN

IV) Change Password

CE Library

Requests 7 OverDue 1 Members Issued Upload CSV AboutUs Logout

Search

Book Name	Author	Publisher	Available
Operating Systems	Garry Nutt	McGrawHill	No <input checked="" type="checkbox"/> Yes
Web Technology	Ramesh Bhangia	Firewall Media	No <input checked="" type="checkbox"/> Yes
Operating System	Achyut S Godbole	McGrawHill	No <input checked="" type="checkbox"/> Yes
Software Matrices	Fenton & Pflieger	Thomson	No <input checked="" type="checkbox"/> Yes
Complete Reference Linux	Richard Peterson	McGrawHill	No <input checked="" type="checkbox"/> Yes
Pragmatic C	R K Jangda	Firewall Media	No <input checked="" type="checkbox"/> Yes
Computer Networks 4th edition	Andrew Tanenbaum	PHI	No <input checked="" type="checkbox"/> Yes
Embedded System	Rajkamal	McGrawHill	No <input checked="" type="checkbox"/> Yes
Programming in C & Numerical Analysis	J B Dixit	FireWall Media	No <input checked="" type="checkbox"/> Yes
Inro Unix and Linux	John Muster	McGrawHill	No <input checked="" type="checkbox"/> Yes

V) Admin Homepage

Department Library x +

127.0.0.1:8000/administrator/BookRequest/

Apps Hibernate Annotati... d Gmail YouTube Maps

CE Library Requests 7 OverDue 1 Members Issued Upload CSV AboutUs Logout

Search

User ID	Name	Book Id	Book Name	Issue
HAP	Hap	CE-002	Web Technology	+
HAP	Hap	CE-003	Operating System	+
HAP	Hap	CE-004	Software Matrices	+
HAP	Hap	CE-005	Complete Reference Linux	+
HAP	Hap	CE-009	Programming in C & Numerical Analysis	+
HAP	Hap	CE-008	Embedded System	+

+

VI) Issue Request

Department Library x +

127.0.0.1:8000/administrator/OverDue/

Apps Hibernate Annotati... d Gmail YouTube Maps

CE Library Requests 7 OverDue 0 Members Issued Upload CSV AboutUs Logout

Search

Book Id	Book Name	Faculty ID	Return Date	Charge	NOTIFY ALL
CE-001	Operating Systems	HAP	April 19, 2020	20	

+

VII) Overdue Page

Department Library

127.0.0.1:8000/administrator/CSV/

CE Library

Requests 0 OverDue 0 Members Issued Upload CSV AboutUs Logout

Faculty CSV

FILE Upload File ENTER DATA

Book CSV

FILE Upload File ENTER DATA

Student CSV

FILE Upload File ENTER DATA

+

VIII) Upload CSV (For adding data from csv file)

Conclusion

- We have implemented all the necessary functionalities for library management.
- We have also taken care of Security issues like Csrp (Cross Site Reference Forgery).
- Users can search books effectively and can issue a book.
- The application is mostly dynamic so that all data is rightful for users.
- Application aims to give effective user experience to end-users.

Limitation and Future extension

Future Extension

- Improving UI.
- Extension in web app.
- Implementation of Qr Scanner or Bar Code Scanner for Books

Bibliography

- To Implement Project Successfully we referred many websites, blogs, forums.
- Reference Links:
 - <https://materializecss.com/>
 - <https://stackoverflow.com/>
 - <https://www.tutorialspoint.com/>
 - <https://docs.djangoproject.com/en/3.0/howto/deployment/>