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B.TECH. (CSE)
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UE22CS341A –Software Engineering

PROJECT REPORT
on

EXAM CENTRE MANAGEMENT SYSTEM

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1. Project Proposal - Introduction

The Exam Centre Management System is a comprehensive system that aims to streamline a university library operation, manage resources effectively and provide an interactive interface for users. This system aims to replace traditional methods with an efficient, user-friendly digital solution to simplify the day-to-day functioning of an exam centre.

The Exam Management System project is a practical integration of Database Management Systems (DBMS) and Software Engineering concepts, designed to address the real-world challenges of managing a library. The primary focus of this project is to create a software application that manages library operations, with an emphasis on database management through CRUD (Create, Read, Update, Delete) operations. The system will be developed as a web-based application that interacts with a relational database.

The objectives of the project are:

- Implement and manage a relational database for storing and retrieving information related to books, members, and transactions.
- Enable seamless creation, reading, updating, and deletion of database entries directly from the application interface.
- Provide functionalities for recording, issuing, and returning books.
- Create a user-friendly interface that simplifies interactions with the database for both library staff and members.
- Ensure the integrity and security of data through verified access controls.

The features of the project are:

- **Verified Login** – Authorized access to the application. Admin, or existing members can seamlessly login to the application. Existing option to add a new member and create a new profile. Primary Login for Admins Only.

- **Book Management-** Operations to add, search, update, and delete book records in the database.

- **Member registration and profile management-** Features to manage member records, including registration, updating details, and deletion.

- **Book loan, return, and reservation functionality-** Track the status of each book. Note down date of borrowing and expected date of return.

- **Overdue alerts and fine calculation-** If any borrowed book is not returned within the expected date , then display an overdue alert and calculate the expected fine based on the number of exceeded days.

- **Admin dashboard for managing books and members-** Admin login provides access to status of books and members of the library system.

2.Project Plan

Life-cycle followed

The chosen lifecycle is a waterfall model as the requirements for the project are clear and well defined.

1. **Product Certainty (High):**

   i. The project requirements and functionality are well-defined.
   ii. The system will manage books, members, and transactions, with clear CRUD operations on each entity.
   iii. The objectives of the system, including member registration, book management, borrowing, and returning operations, are standard functionalities that are predictable and well understood.
   iv. There are no ambiguous or experimental features in the system, ensuring a high level of confidence in the product.

2. **Process Certainty (High):**

   i. The chosen Waterfall model provides a structured approach with clear phases: requirements, design, development, testing, and deployment. Since each phase has clear goals and deliverables, it eliminates uncertainties.

3. **Resource Certainty (High):**
   i. The tools and technologies needed for the project, such as MySQL Workbench, Python, Streamlit, and version control systems, are widely available and accessible.
   ii. We have access to the required resources, including development tools, databases, and libraries, ensuring no significant gaps in expertise or tooling.
   iii. Since this is a known system with no high-level complexity, the resource allocation is predictable and manageable.

The degree of certainty for **Product, Process and Resource is – high,high,high.**

Tools Used for this Project

i. **Planning Tool**: Google Sheets- for initial planning, task distribution, and creating simple timelines.

ii. **Design Tool:** smartdraw – for creating flowcharts, ER diagrams, and other design diagrams; Figma – for creating a wireframe of the UI if required.

iii. **Version Control:** Git & GitHub- for managing our source code, maintaining versions, and collaboration.

iv. **Development Tool:** Python (in VS Code) with Streamlit for quick iterations on the frontend; MySQL for backend development.

v. **Bug Tracking:** GitHub Issues (for tracking bugs and feature requests as they emerge).

vi. **Testing Tool:** PyTest for unit testing in Python; Selenium for web application testing (if required).

Deliverables classified as reuse/build components

1.Reuse Components:

i. ER diagrams for reference.
ii. Using MySQL as the back-end database system to manage records like books, members, loans, etc.,
iii. MySQL connectors, frameworks.
iv. Python and Streamlit libraries
v. Basic frontend components .

Reusing existing, reliable libraries and connectors allows us to save development time and ensure the robustness of our system.

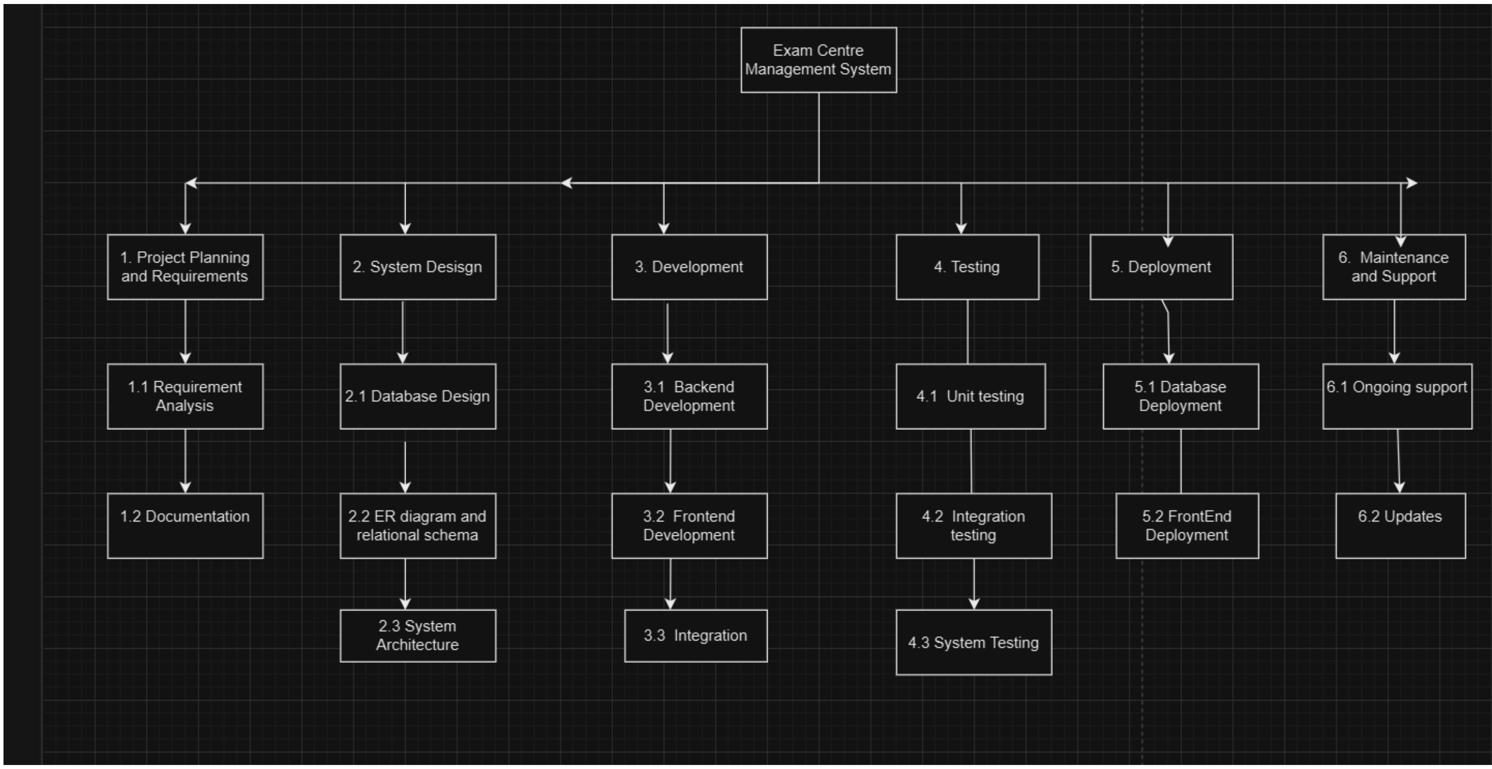
2.Build Components:

i. Custom user authentication
ii. CRUD operations for the Exam Centre Management System.
iii. A custom front-end interface for library administrators and users to manage books, members, and transactions.
iv. The database schema for books, members, transactions, and overdue fees designed specifically for this EMS.
v. The core functionality such as issuing and returning books, calculating late fees, tracking availability.

These components need to be custom-built as per project-specific requirements, like member management, book transactions, etc.

Work Breakdown Structure

This project follows a deliverable-based WBS, as each phase produces a specific outcome (e.g., database setup, UI development, deployment). We have four deliverables in the form of SRS, Project Plan, Testing details and final report. Hence, this project follows a deliverable based WBS.



1. Project Planning and Requirements

- 1.1 Requirement Analysis
    - 1.1.1 Identify functional and non-functional requirements.
    - 1.1.2 Define scope (CRUD operations, book management, member management, transactions).
- 1.2 Documentation
    - 1.2.1 Create Software Requirements Specification (SRS).
    - 1.2.2 Review and finalize project plan with timeline and deliverables.

2. System Design

- 2.1 Database Design
    - 2.1.1 Design the Books Table (fields: book_id, title, author, genre, availability_status).
    - 2.1.2 Design the Members Table (fields: member_id, name, contact_info, membership_id).
    - 2.1.3 Design the Transactions Table (fields: transaction_id, book_id, member_id, borrow_date, return_date).
- 2.2 ER Diagram and Relational Schema
    - 2.2.1 Create an ER diagram to model relationships between books, members, and transactions.
    - 2.2.2 Develop the relational schema for MySQL database.
- 2.3 System Architecture

  - 2.3.1 Define system architecture (frontend in Streamlit, backend in MySQL).
  - 2.3.2 Plan API structure for frontend-backend communication.

3. Development

- 3.1 Backend Development
  - 3.1.1 Set up MySQL database with defined schema.
  - 3.1.2 Implement CRUD operations for Books Table (add, update, delete, view).
  - 3.1.3 Implement CRUD operations for Members Table (register, update, delete, view).
  - 3.1.4 Implement transaction management (borrow, return, and view transactions).
- 3.2 Frontend Development
  - 3.2.1 Build user interface in Streamlit for book management.
  - 3.2.2 Build UI for member registration and management.
  - 3.2.3 Build UI for transaction management (borrowing and returning books).
- 3.3 Integration
  - 3.3.1 Connect frontend with MySQL backend.
  - 3.3.2 Test integration of all CRUD functionalities.

4. Testing

- 4.1 Unit Testing
  - 4.1.1 Test individual CRUD operations for books, members, and transactions.
- **4**.2 Integration Testing
  - 4.2.1 Test integration between frontend and backend.
  - 4.2.2 Ensure data consistency and smooth flow between components.
- 4.3 System Testing
  - 4.3.1 To validate entire flow .

5. Deployment

- 5.1 Database Deployment
  - 5.1.1 Deploy MySQL database on server.
- 5.2 Frontend Deployment
  - 5.2.1 Deploy Streamlit frontend to web server.

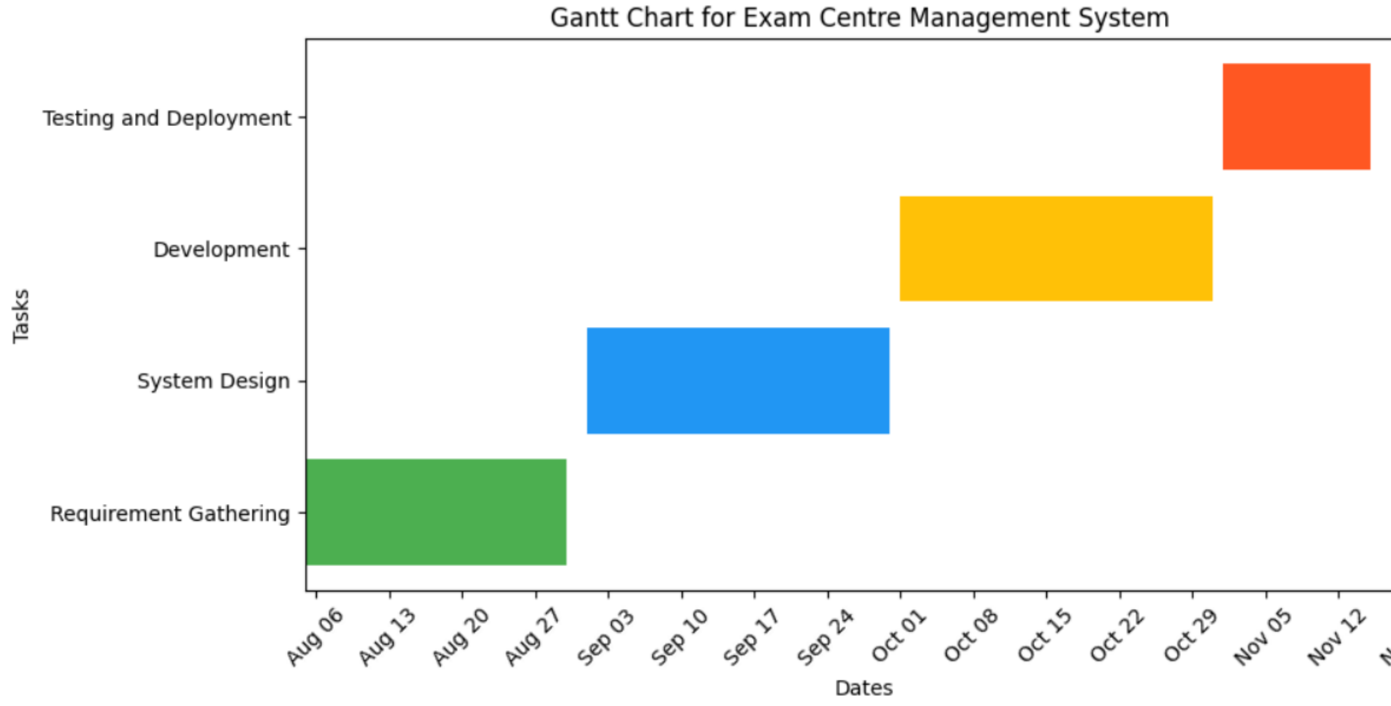
6. Maintenance and Support

- 6.1 Ongoing Support
  - 6.1.1 Monitor system performance.
  - 6.1.2 Resolve any post-deployment bugs.
- 6.2 Updates
  - 6.2.1 Plan for future system updates and enhancements.

Effort Estimation (in person-months)

This project is to be completed in the months of August-November 2024.
No of months =4, no of persons = 2.
No of working days = (260/12) * 4 = 86.6 working days.
Effort for one person would be 7/86.6 = 0.080 P-M
Effort for two persons= 0.161 P-M

Gantt Chart



3.Software Requirement Specification

1.Introduction

1.1 Purpose

The purpose of this document is to define the requirements for a Exam Centre Management system (EMS) that will simplify the operations of a library, providing users with the ability to manage books, members, and transactions efficiently.

1.2 Scope

The Exam Centre Management System will provide a user-friendly interface for managing a library's book inventory, member registrations , and borrowing/returning activities. The system will allow library administrators to perform CRUD operations on the database tables that store information about books, members, and transactions. The system is a multi-user system which will be primarily used by library administrators , but can be accessed by members as well.

1.3 Definitions, Acronyms, and Abbreviations

SQL: Structured Query Language

CRUD: Create, Read, Update, Delete

EMS: Exam Centre Management System

UI: User Interface

Admin: Administrator of the EMS

Member: A registered user of the library who can borrow books

BN: Book Number

1.4 References

Database Management System principles and design .

Software Engineering concepts and practices.

SQL commands and syntax.

Github

1.5 Overview

This document is divided into the following sections:

1. System Overview
2. Functional and Non-Functional Requirements
3. System Model and Design
4. External Interface Requirements
5. System Features

2. System Overview

2.1 Product Perspective

The EMS will consist of a user interface and a backend database created using SQL. Users (library administrators) will interact with the system through the GUI to perform CRUD operations on the database.

2.2 System Functions

i. Authentication: Ensure that only authorized users can access the system.
ii. Manage Books: Add, view, update, and delete book records.
iii. Manage Members: Add, view, update, and delete member records. Manage Transactions: Record book borrowings and returns.

2.3 User Characteristics

The primary users of the system will be library administrators who have basic knowledge of library operations and are familiar with computer usage. Secondary users are members of the library who only have limited functionalities.

2.4 Operating Environment

i. Hardware: Desktop or laptop computers with standard input/output devices.
ii. Software: The system will run on Windows, macOS, or Linux operating systems.
iii. Network: LAN or stable internet connection.

2.5 Design and Implementation Constraints

i. Database: The system will use a relational database (MySQL) to store all library data.
ii. Programming Language: The system will be developed using Python and its libraries for database connectivity and UI using streamlit.
iii. User Interface: The system will use a simple, web-based UI for accessibility and ease of use.

2.6 Assumptions and Dependencies

The system is dependent on the availability of a relational database system. Users have basic computer literacy to interact with the EMS, and a stable internet connection.

3. External Interface Requirements

3.1 User Interface

1. Login Screen: Allows Admin and members to authenticate themselves.
2. Dashboard: Provides an overview of the library, and helps navigate to each functionality.
3. Book Management Screen: Interface for adding, viewing, updating, and deleting books.
4. Member Management Screen: Interface for registering new members and managing member information.
5. Transaction Management Screen: Interface for recording book borrowings and returns.

3.2 Software Interfaces

i. Database: The EMS will interface with a relational database system using SQL.

ii. Web Browser: The UI will be accessible via standard web browser.

4. System Features

4.1 Authentication

The EMS will include a secure login system to ensure that only authorized personnel can access the administrative features of the system.

4.2 Functional Requirements

4.2.1 Book Management

1. 4.2.1.1 Add Book: The system shall allow the admin to add a new book record to the database. The admin must provide the book's title, author, publication year, genre, and availability status.
2. 4.2.1.2 View Books: The system shall allow the admin/member to view a list of all books in the library. The user can search for books by title, author, or genre.
3. 4.2.1.3 Update Book: The system shall allow the admin to update the details of an existing book record.
4. 4.2.1.4 Delete Book: The system shall allow the admin to delete a book record from the database.

4.2.2 Member Management

1. 4.2.2.1 Add Member: The system shall allow the admin to add a new member to the library's database. The admin must provide the member's name, contact information, and membership ID.
2. 4.2.2.2 View Members: The system shall allow the admin to view a list of all library members. The admin can search for members by name or membership ID.
3. 4.2.2.3 Update Member: The system shall allow the admin to update the details of an existing member record.
4. 4.2.2.4 Delete Member: The system shall allow the admin to delete a member record from the database.

4.2.3 Transaction Management

1. 4.2.3.1 Record Borrowing: The system shall allow the admin to record the borrowing of a book by a member. The member must specify the book ID, member ID, and the borrowing date.
2. 4.2.3.2 Record Return: The system shall allow the admin to record the return of a borrowed book. The member must specify the book ID, member ID, and the return date.
3. 4.2.3.3 View Transactions: The system shall allow the admin to view a list of all borrowing and return transactions.

4. 3 Non-Functional Requirements

4.3.1 Usability

The system shall provide a simple GUI that can be easily navigated by users with basic computer skills.

4.3.2 Security

The system shall restrict access to administrative functionalities to authorized users only. User authentication will be required for access.

4.3.3 Maintainability

The system shall be designed in a modular manner, allowing easy updates and maintenance of individual components.

4.3.4 Reliability

The system shall ensure data integrity and reliability, particularly during database transactions, to prevent data loss or corruption.

5. System Model and Design

5.1 Database Design

1. The system shall use a relational database to store information about books, members, and transactions.
2. The database tables shall include:
   - i. Books Table: book_id (Primary Key), title, author, publication_year, genre, availability_status.
   - ii. Members Table: member_id (Primary Key), name, contact_information, membership_id.
   - iii. Transactions Table: transaction_id (Primary Key), book_id (Foreign Key), member_id (Foreign Key), borrow_date, return_date.

5.2 User Interface Design

The GUI created using streamlit shall be designed to facilitate easy access to all CRUD functionalities.

The interface shall include options for adding and updating records, and tables for viewing lists of books, members, and transactions.

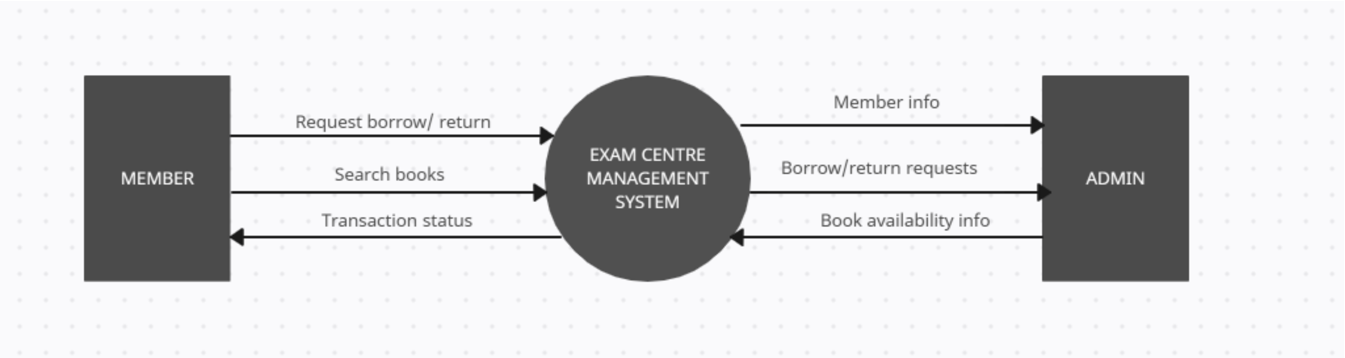
REQUIREMENTS TRACEABILITY MATRIX:

Requirement ID	*Requirement Description*	*Functional Requirement*	Design Specification	*Test Cases*
FR-1	Add Book	4.2.1.1	Books table	TC-01
FR-2	View Books	4.2.1.2	Books table	TC-02
FR-3	Update Book	4.2.1.3	Books table	TC-03
FR-4	Delete Book	4.2.1.4	Books table	TC-04
FR-5	Add Member	4.2.2.1	Members table	TC-05
FR-6	View members	4.2.2.2	Members table	TC-06
FR-7	Update members	4.2.2.3	Members table	TC-07
FR-8	Delete members	4.2.2.4	Members table	TC-08
FR-9	Record borrowing	4.2.3.1	Transactions table	TC-09
FR-10	Record Return	4.2.3.2	Transactions table	TC-10
FR-11	View Transactions	4.2.3.3	Transactions table	TC-11
NFR-1	Usability	4.3.1	User Interface	TC-12
NFR-2	Reliability	4.3.2	Data Integrity checks	TC-13
NFR-3	Security	4.3.3	User Interface	TC-14
NFR-4	Maintainability	4.3.4	Modular design	TC-15

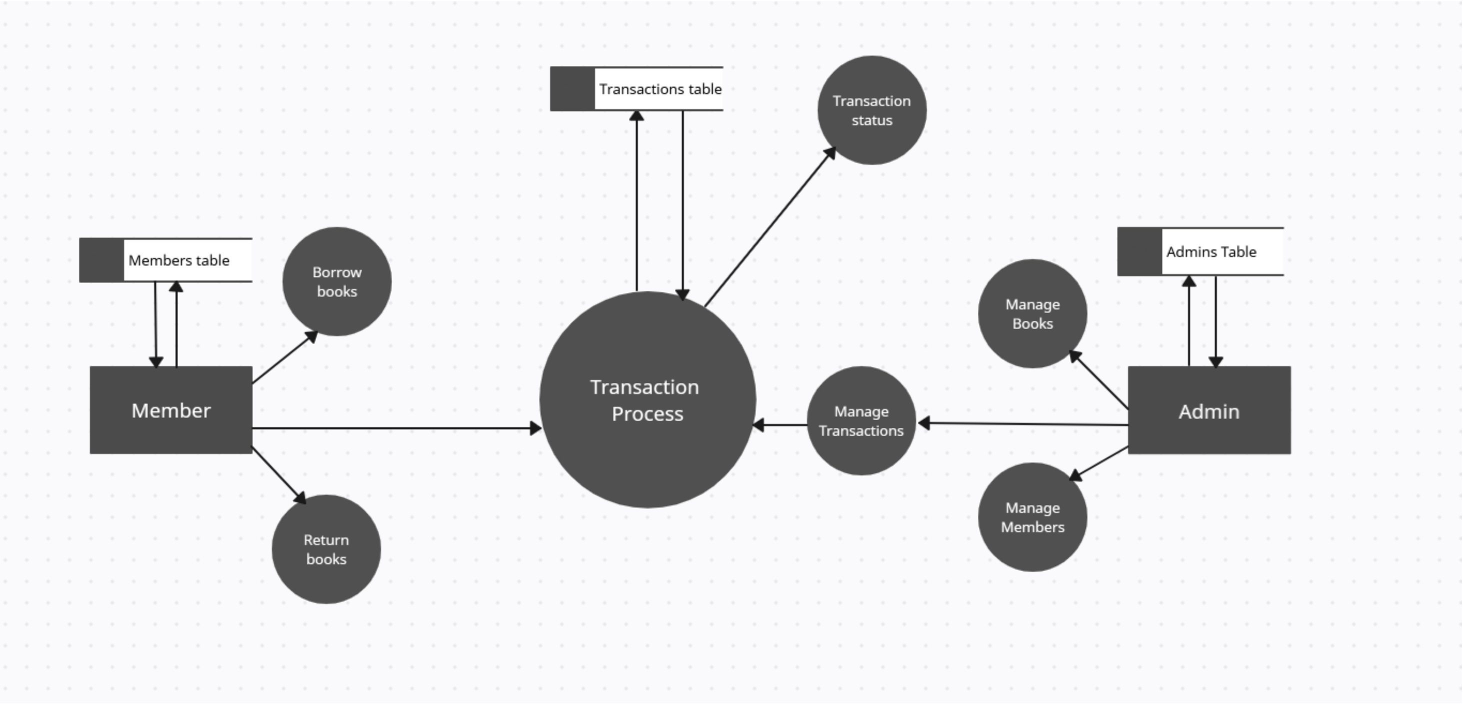
4.Design Diagrams

Diagrams of Levels of DFD

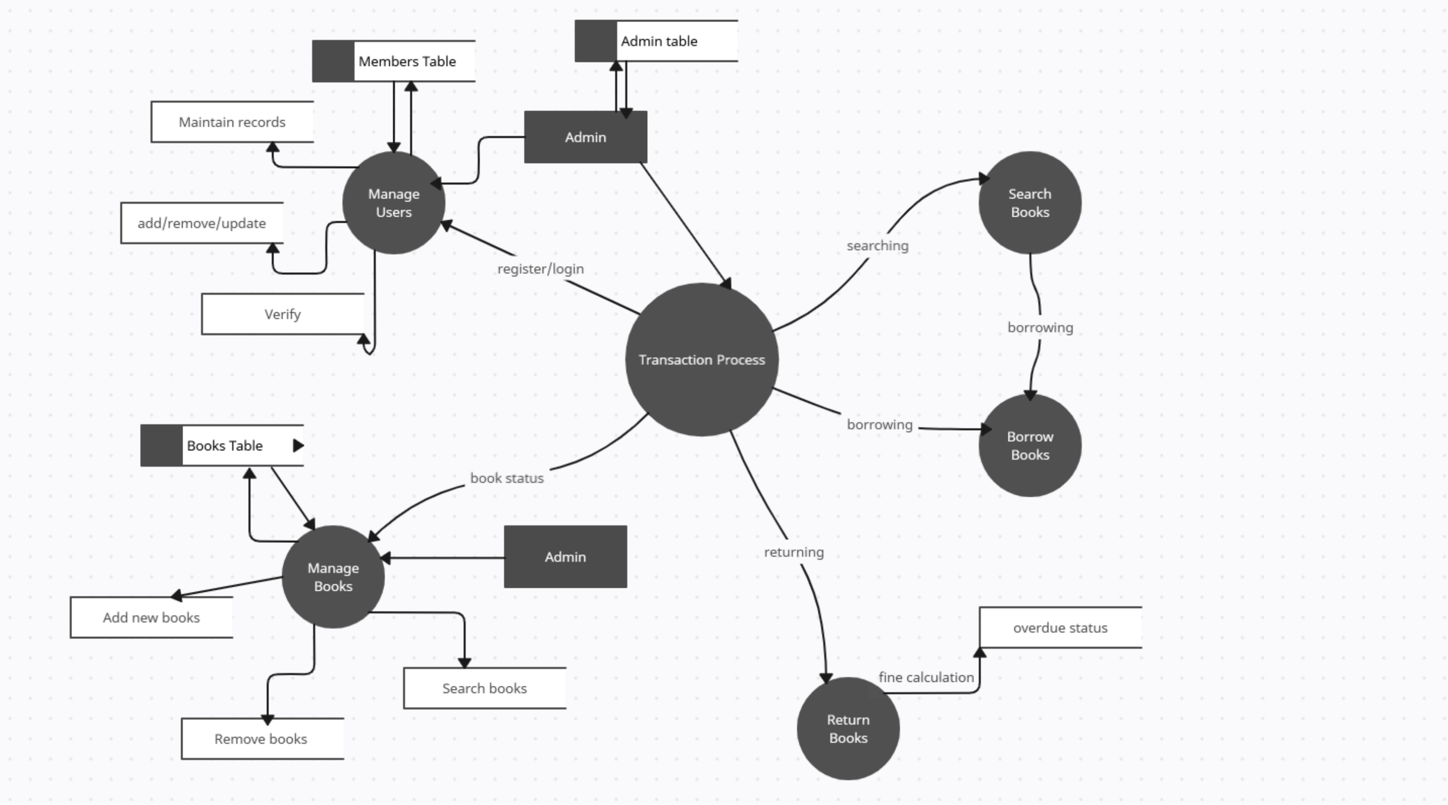
Top-level DFD(0 -level DFD)



First level DFD



Second Level DFD



Architectural Design

Layered Architecture :

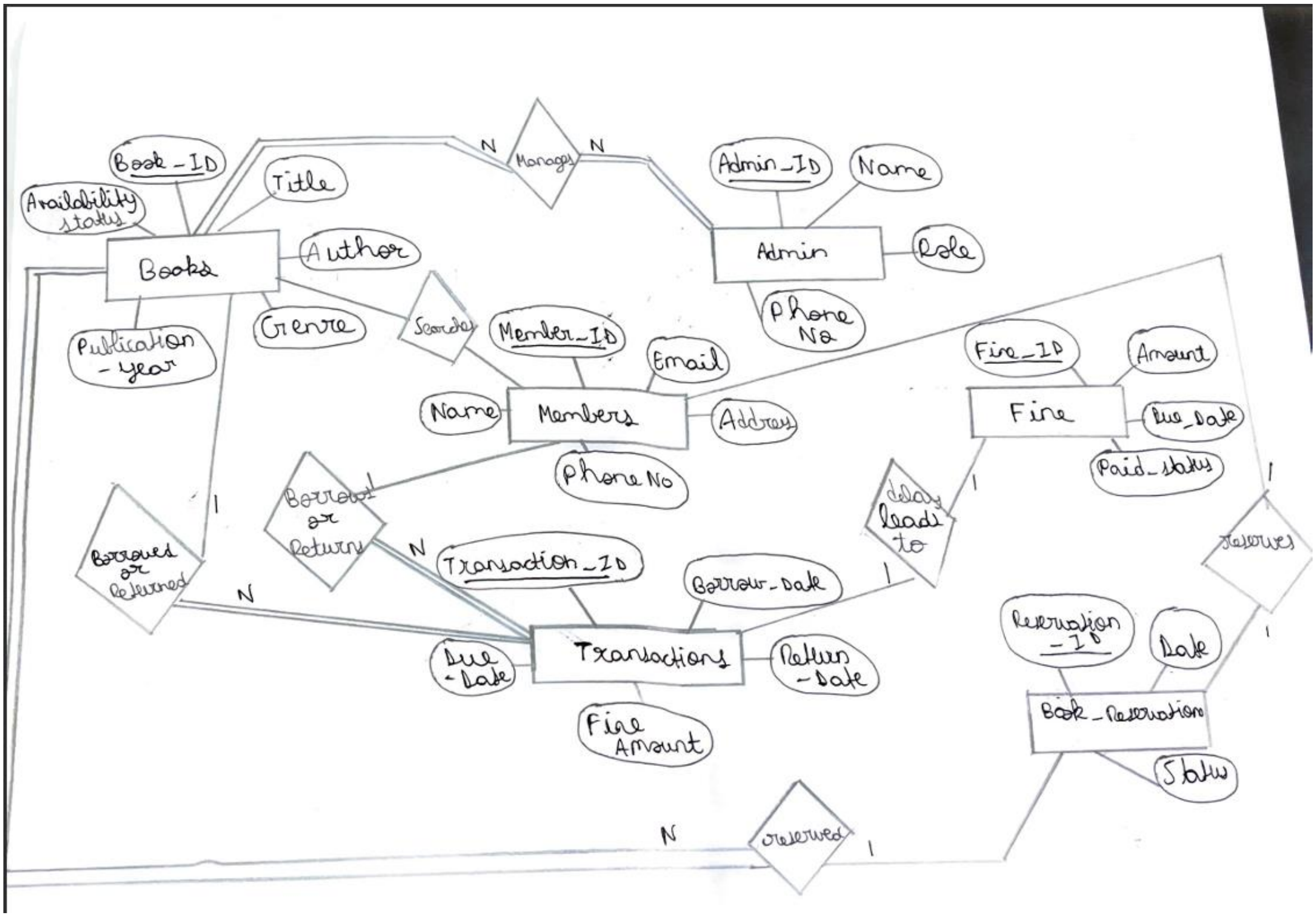
1. **Presentation Layer (User Interface)**:
   - This layer handles user interactions and presents information to users.
   - This includes pages for managing books, and user registration.
   - Streamlit for Python-based web app created.

2. **Application Layer (Business Logic)**:
    - The core logic that defines how data from the presentation layer is processed.
    - Handles the rules for book issuing, returning, calculating fines, and user authentication.
    - Example functions: issueBook(), calculateFine().

3. **Data Access Layer**:
    - This layer is responsible for retrieving, updating, and managing data stored in the database.
    - This would include CRUD operations for managing records like books, exams, transactions, and users.
    - Interacts with the database using SQL queries

4. **Database Layer**:
    - The underlying storage for all the data.
    - Consists of tables for books, users, and transactions.
    - Ensures data integrity and relationships through primary and foreign keys.

ER diagram


Book_ID
Title
Availability status
Books
Author
Publication - year
Genre
N
Manages
N
Admin_ID
Name
Admin
Role
Phone No
Search
Member_ID
Email
Name
Members
Address
Phone No
Fine_ID
Amount
Fine
Due_Date
Paid_status
1
delay leads to
1
Borrow or Return
1
N
Borrowed or Returned
1
N
Transaction_ID
Borrow_Date
1
Transactions
Due - Date
Return - Date
Fine Amount
Reservation - ID
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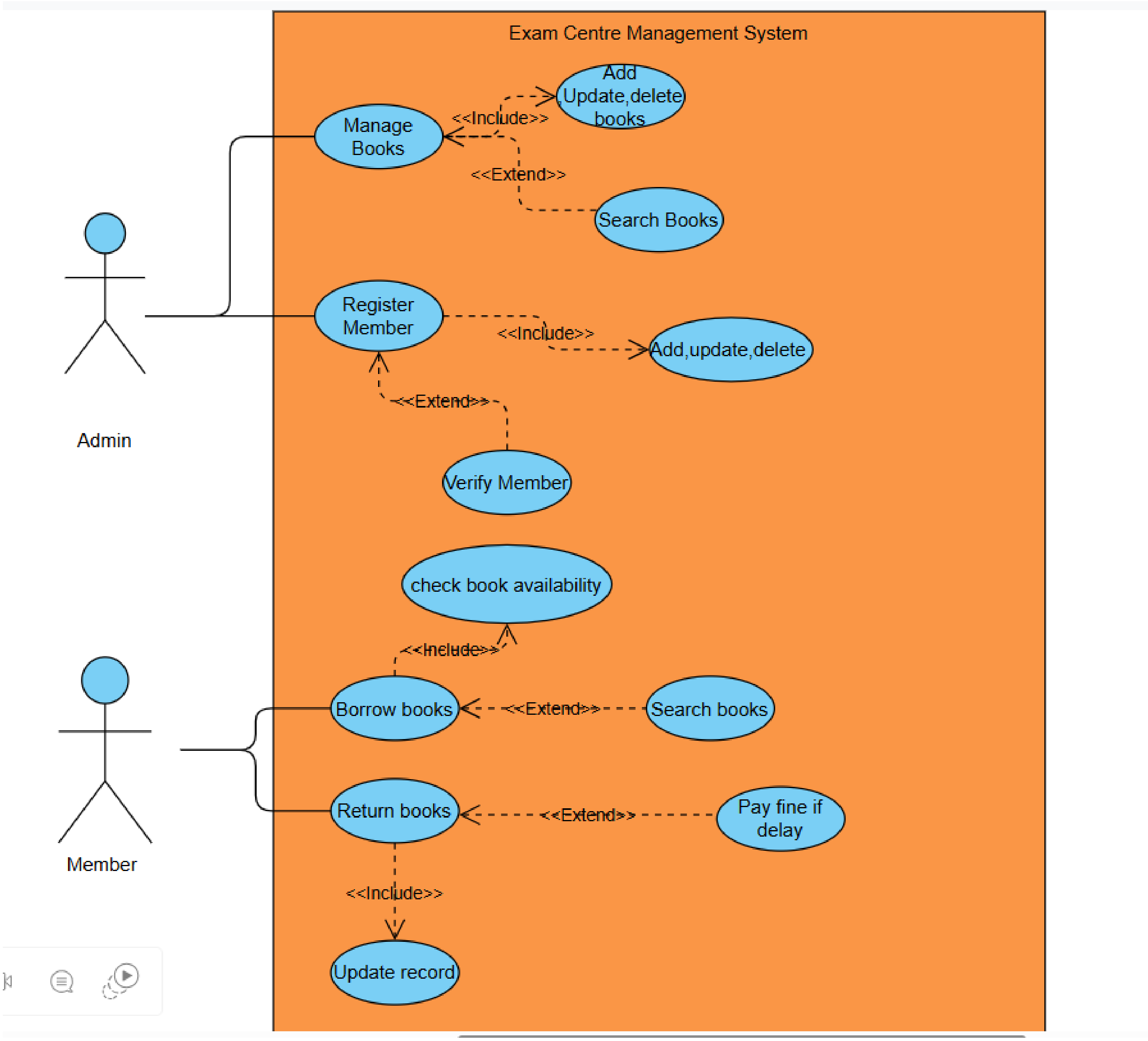
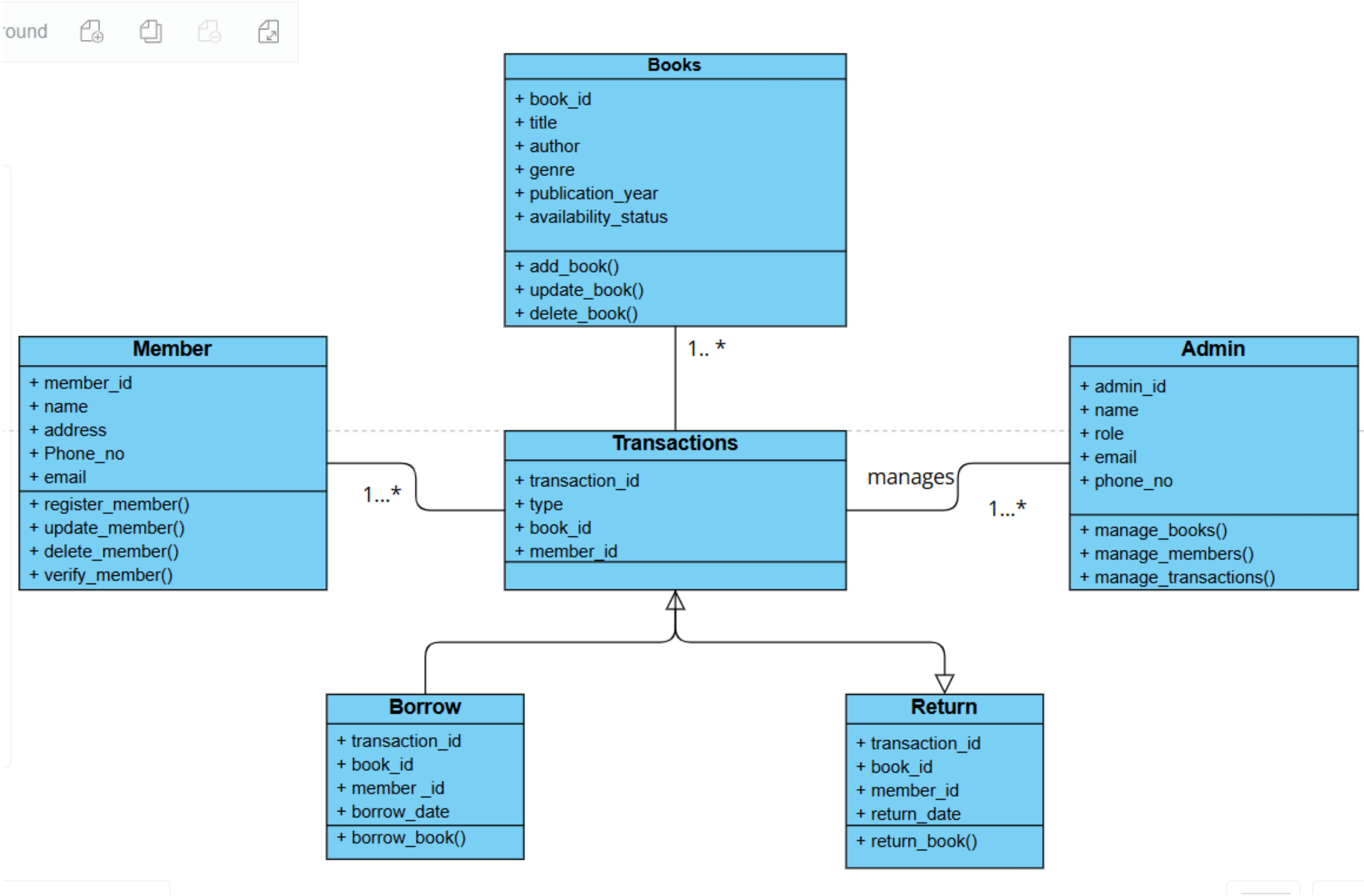
Status
reserves
1
1
N
reserved
1

UML

Use Case Diagram



Class Diagram



5.Test Plan, Cases

Test Case ID	Name of Module	Test Case Description	Pre-conditions	Test Steps	Test Data	Expected Results	Actual Results	Test Result
UT-01	Member valid login	Login through member credentials	Login possible only if registered account. Access to browser.	Click on member login. Enter username and password , click on submit	Username: john_doe Pwd: member123	Login to member portal	Login to member portal	Pass
UT-02	Member invalid login	Login through invalid member credentials	Login possible only if registered account. Access to browser.	Click on member login. Enter username and password , click on submit	Username: abc_x Pwd: member124	Display error message	Display error message, “Invalid login”	Pass
UT-03	Admin valid login	Login through admin credentials	Login possible only if registered account. Access to browser.	Click on admin login. Enter username and password , click on submit	Username: admin Pwd: admin123	Login to admin portal	Login to admin portal	Pass
UT-04	Admin invalid login	Login through invalid admin credentials	Login possible only if registered account. Access to browser.	Click on admin login. Enter username and password , click on submit	Username: admin3 Pwd: admin1234	Display error message	Display error message, “Invalid login”	Pass

UT-05	Add Book	Admin can successfully add a new book	Login through valid admin credentials	Add book with valid ISBN, title, author, and category. Successfully stored in the database.	ISBN: 1234567890123 Title: organic chemistry Author: xyz Category: Chemistry	Book added and stored in the database	Book added and stored in the database	Pass
UT-06	Add Book with incorrect ISBN format	Book cannot be added due to incorrect format.	Login through valid admin credentials	Add book with invalid ISBN, not stored in the database.	ISBN: 123456789012 Title: organic chemistry Author: xyz Category: Chemistry	Error message: “Incorrect ISBN format	Error message: “Incorrect ISBN format	Pass
UT-07	Borrow Book	Member can successfully borrow a book	Login through valid member credentials	Click on borrow book and select desired book	‘learn chemistry fundamentals’	Book borrowed successfully	Book borrowed successfully	Pass
UT-08	Borrow book that does not exist	Member cannot borrow a book that does not exist in the database.	Login through valid member credentials	Click on borrow book and select desired book	‘Learn Rust programming’	Display error message as book does not exist in inventory	Display error message as book does not exist in inventory	Pass
UT-09	Return book	Member can return borrowed book	Login through valid member credentials	Click on return book and return borrowed book	‘Learn chemistry fundamentals’	Book returned successfully	Book returned successfully	Pass

UT-10	Return book not borrowed	Member cannot return book not borrowed	Login through valid member credentials	Click on return book and return borrowed book	‘ Engineering Mechanics’	Display ‘ No book to return’	Display ‘ No book to return’	Pass
UT-11	Delete book	Verify that an admin can successfully delete a book	Login through valid admin credentials book	Select the desired book and click on delete book	‘ Mechanical Engineering principles’	Book deleted successfully	Book deleted successfully	Pass
UT-12	Deleting a book that has been borrowed	Verify that an admin cannot delete a book that has been borrowed currently	Login through valid admin credentials and click on delete book	Select the desired book and click on the delete book option.	‘ Learn Chemistry Fundamentals’	Display error message “borrowed book cannot be deleted”	Display error message “borrowed book cannot be deleted”	Pass
UT-13	Edit book details	Verify that an admin can edit details of a book stored in the inventory.	Admin must be logged in with valid credentials.	Navigate to the "Edit Book" section. Select the book to be edited and modify its details. Save the changes	ISBN: 1234567890123 New Title: Advanced Chemistry	The book details are updated successfully and reflect the changes.	The book details are updated successfully and reflect the changes.	Pass
UT-14	Attempt to edit non existing book	Verify that editing a book that does not exist in the database	Admin must be logged in with valid credentials.	Navigate to the "Edit Book" section. Enter a non-existent ISBN.	ISBN: 1004008009011	Display error message: "Book not	"Book not found."	Pass

		shows an error.				found."		
UT-15	Add Member	Verify that an admin can add a new member to the system successfully.	Admin must be logged in with valid credentials.	Navigate to the "Add Member" section. Enter the new member's details and submit the form	Username: aathil_nishad □ Password: pass123 □ Email: aathilnishad@gmail.com	Member added and stored in the database, visible in the member list	Member added and stored in the database, visible in the member list	Pass
UT-16	Add Member with Existing Username	Verify that adding a member with an existing username shows an error.	Admin must be logged in, and the username must already exist in the database.	Navigate to the "Add Member" section. Enter an existing username and submit the form	Username: David_miller	Display error message: "Username already exists."	"Username already exists."	Pass
UT-17	Update Member Information	Verify that an admin can update a member's details successfully.	Admin must be logged in with valid credentials, and the member should exist in the database.	Navigate to the "Edit Member" section. Select a member and update the details.	Username: john_doe New Email: john_doe_updated@example.com	Member details are updated in the database.	Member details are updated in the database.	Pass
IT-01	View Books	Verify that the system fetches and displays the list of all books	Login either through member or admin credentials	Select the view books option.	Book stored in the database with all their details.	List of all books with all details.	List of all books with all details.	Pass

IT-02	Search Books	Verify that the system allows users to search for books by title, author, or category	Login either through member or admin credentials.	Select the view books option and click on search	‘ Software Engineering’	Display the book ‘Software Engineering’	Display the book ‘Software Engineering’	Pass
IT-03	Search books using author name	Verify that the system allows users to search for books by title, author, or category	Login either through member or admin credentials.	Select the view books option and click on search	Author: ‘Ian Stewart’	Display book ‘Elements of number theory’	Display book ‘Elements of number theory’	Pass
IT-04	Search book that does not exist	Verify that the system allows users to search for books by title, author, or category	Login either through member or admin credentials.	Select the view books option and click on search	“Elements of electrical engineering”	Display error message as book does not exist in inventory	Display error message as book does not exist in inventory	Pass
IT-05	View Members	Verify that the admin can view the list of all registered members, including their details	Login through valid admin credentials	Select the view members option after logging in.	List of all members registered and stored in the database.	Display the list of all registered members with all their details.	Display the list of all registered members with all their details.	Pass

IT-06	Search member	Verify that the admin can view all the details of a registered member	Login through valid admin credentials	Select the view member option, search for a particular member.	“john_doe”	Name, username, email , status of john_doe	Name, username , email , status of john_doe	Pass
IT-07	Search member not registered	Verify that the admin can not view the details of a member not registered.	Login through valid admin credentials.	Select the view member option, search for a particular member.	Harry_wilson	Error, member does not exist	Error, member does not exist	Pass
IT-08	View member transactions	Verify that the admin can view the transaction history for a selected member	Login through valid admin credentials.	Select the view member transactions and choose a registered member	david_miller	The list of all books borrowed/returned	The list of all books borrowed /returned	Pass
IT-09	View Overdue Books	Verify that the admin can view a list of books that are overdue.	Admin must be logged in with valid credentials.	Navigate to the "Overdue Books" section. View the list of overdue books	None required.	Display a list of books that are overdue , with member details and due dates.	Book: ‘Learn Chemistry Fundamentals’ Name: John_doe Date: 7/11/24	Pass

IT-10	Check Duplicate Book Entry Prevention	Verify that the system prevents the addition of duplicate books.	Admin must be logged in with valid credentials.	Navigate to the "Add Book" section. Enter the details of an existing book (same ISBN)	SBN: 1234567890123	Display error message: "Book with this ISBN already exists."	Display error message: "Book with this ISBN already exists."	Pass
ST-01	My transactions	Verify that a member can view their transaction history.	Login through valid member credentials.	Select my transactions option	John_doe	The list of all transactions associated with the member	The list of all transactions associated with the member	Pass
ST-02	Borrow and return book	Verify that the system updates the book availability status correctly when a member borrows and returns a book	Login through valid member credentials to first borrow a book, Login through valid admin credentials to check status	Select a book to borrow/return Click on a particular book to check status.	John_doe Borrow: ‘Learn chemistry fundamentals’	Display ‘learn chemistry fundamentals status as “borrowed by john_doe”	Display ‘learn chemistry fundamentals status as “borrowed by john_doe ”	Pass
ST-03	Fine Calculation	Verify that the system calculates the due date and fine correctly when a member	Login through valid admin credentials.	Select view member transactions and select a member.	David_miller Borrwed book: ‘Engineering Mechanics” Borrow date: 24/10/24	Fine of 50Rs per day since expected date	Fine of 50Rs per day since expected date of return.	Pass

		borrows and returns a book			Expected Return date: 7/11/24 Return date: 9/11/24	of return. Total fine: 100 Rs	Total fine: 100 Rs	
ST-04	Delete book	Verify that the system prevents any pending transactions (borrows or returns) for a deleted book	Login through valid admin credentials.	Navigate to Delete Book section Search for the book to be deleted Select the book Click Delete button Check transaction records Check book status	ISBN: "9780132350884" Title: "Clean Code" Status: "Borrowed"	Warning message displayed: "Cannot delete book - Active borrowers exist"	Warning message displayed: "Cannot delete book - Active borrowers exist"	Pass
ST-05	Register Member	Verify that the newly registered member can successfully login and access the member portal	Login through newly created member credentials	Navigate to the member login section and login through newly created member credentials.	Username: David_miller Password: member123	Successful login into the member portal	Successful login into the member portal	Pass
ST-06	Member portal access	Verify that an admin can not access any member's portal	Login through admin credentials into the member portal	Navigate to the member login section and login through admin credentials.	Username: admin Password: admin123	Display message: "Cannot login to member portal"	Display message: "Cannot login to member portal"	Pass

ST-07	Password Reset for Member	Verify that a member can reset their password successfully.	Member must be registered.	Navigate to the "Forgot Password" section. Enter the member's username and receive a reset link. Follow the link and set a new password.	Username: john_doe	Password reset successful and member can log in with the new password.	Password reset successful and member can log in with the new password.	Pass

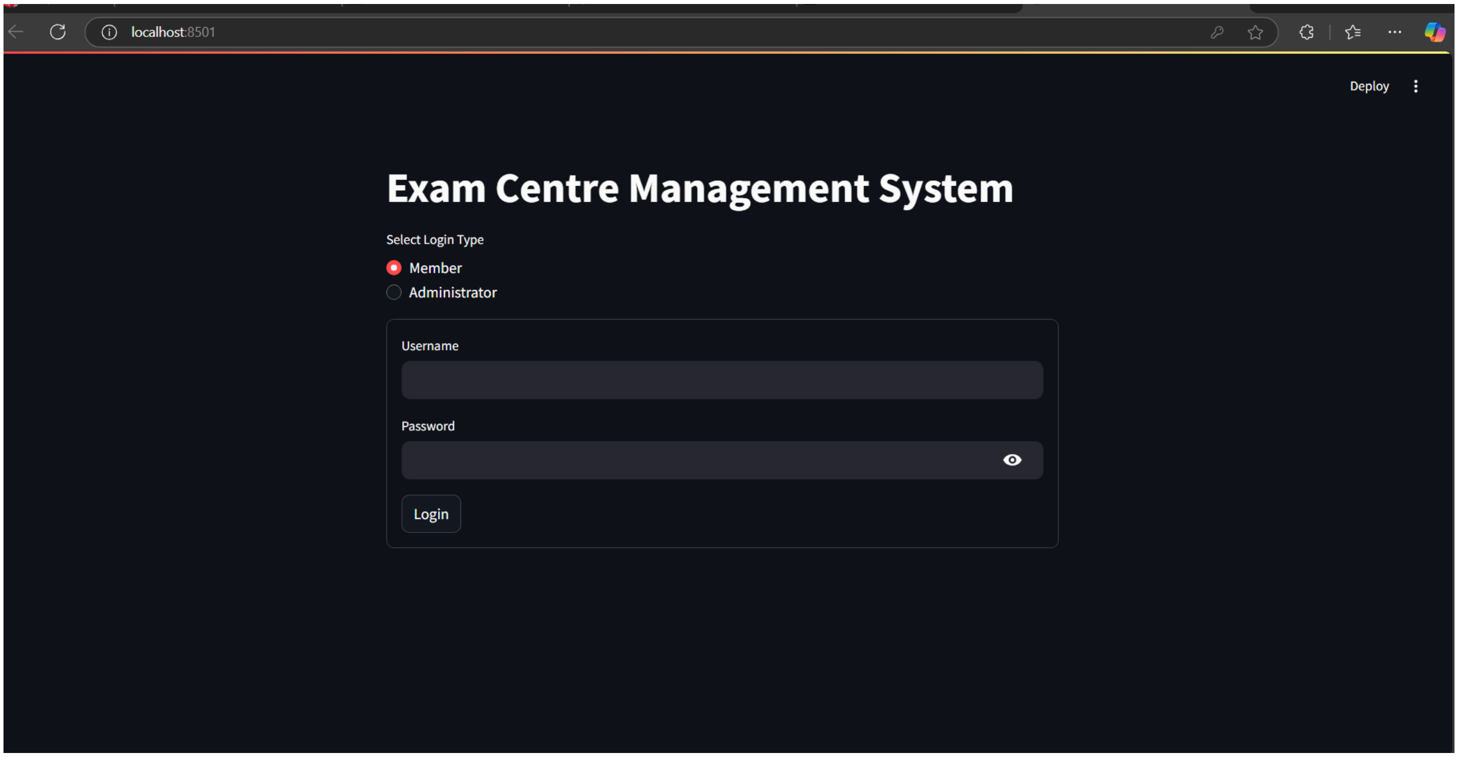
6.Screenshots of Test Output

1. Main Structure:

- The application uses a single-page architecture managed by main() function
- It maintains user state using Streamlit's session state (st.session_state)
- Two main portals: Admin Portal and Member Portal
- Login page as the entry point.

2. Login Page (login_page()):

- Clean title "Exam Centre Management System"
- Radio button to select user type (Member/Administrator)
- Simple form with:
  - Username input
  - Password input (masked)
  - Login button
- Success/Error messages for login attempts



Exam Centre Management System

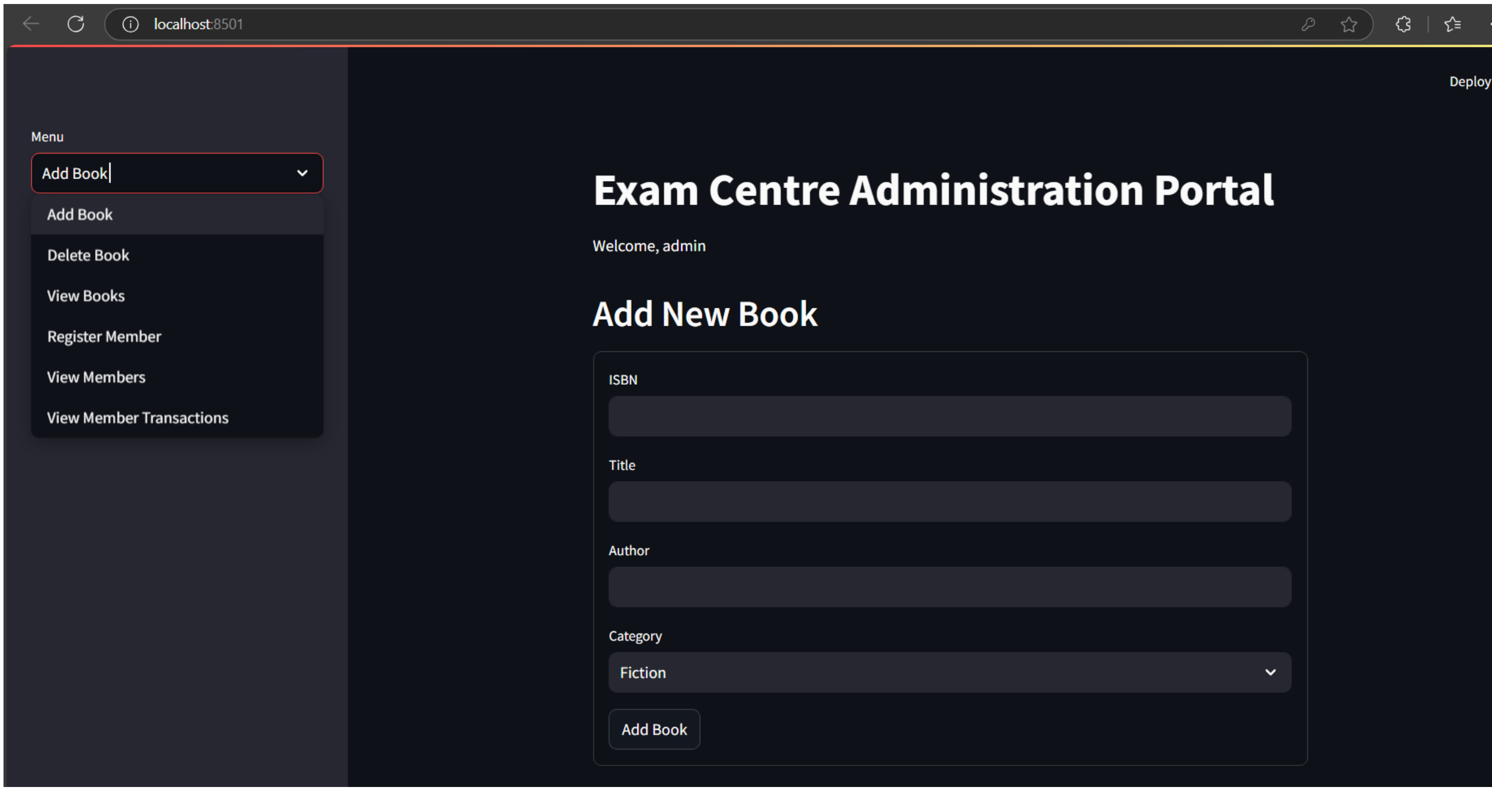
Select Login Type

● Member

○ Administrator

3 Admin Portal (admin_portal()):

- Sidebar menu with options:
  - Add Book
  - Delete Book
  - View Books
  - Register Member
  - View Members
  - View Member Transactions
- Each menu option has its own section with relevant forms and tables
- Logout button in sidebar



Exam Centre Administration Portal

Welcome, admin

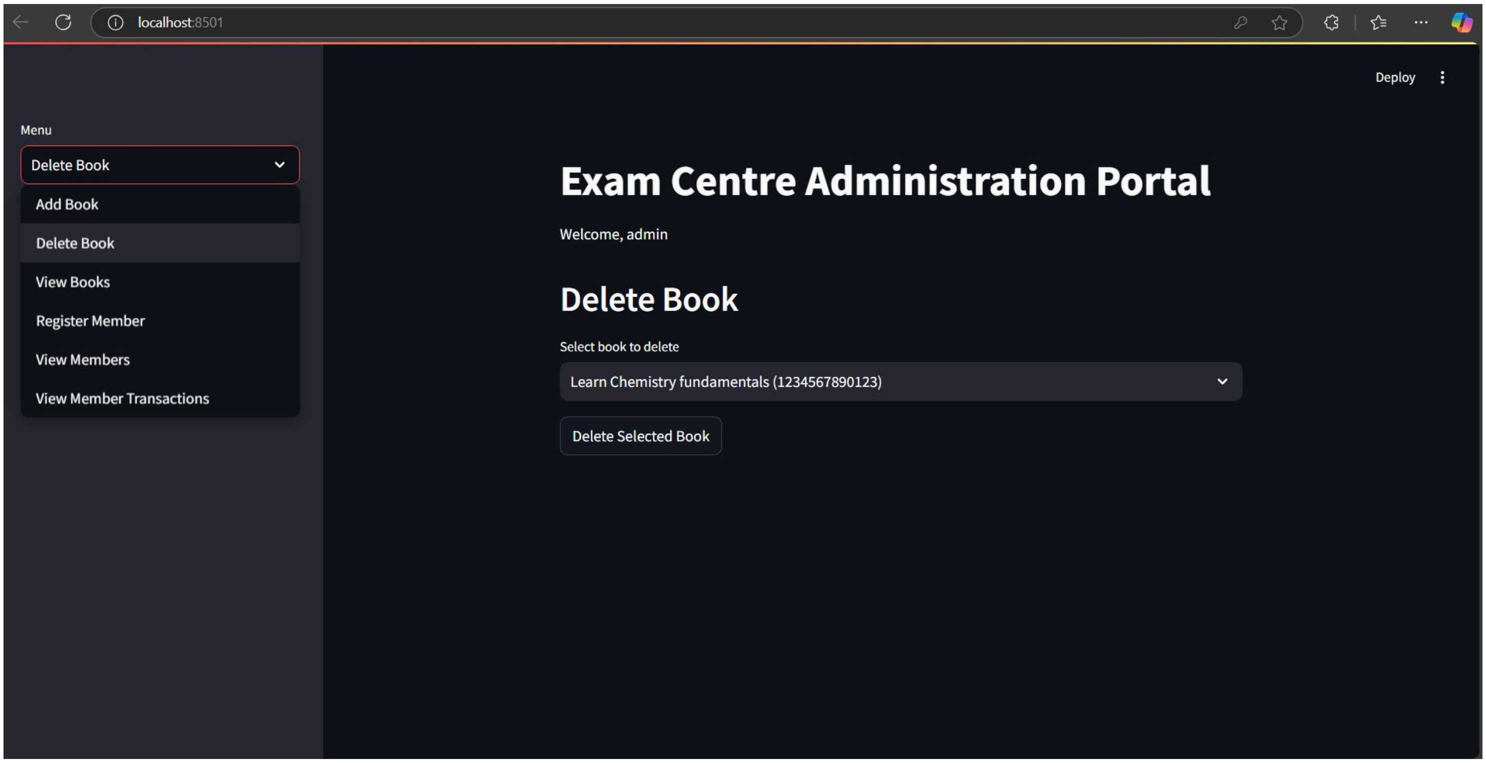
Add New Book

ISBN

Title

Author

Category: Fiction

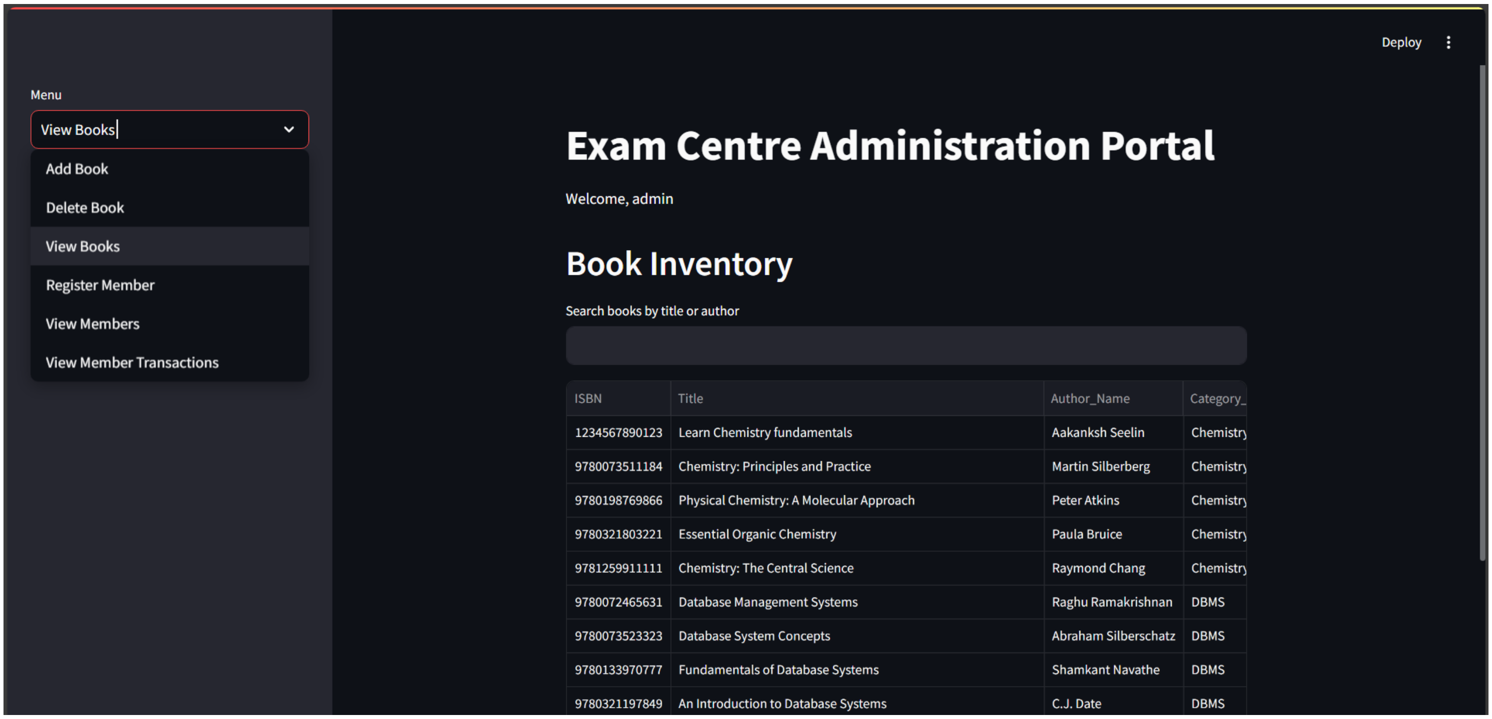


Exam Centre Administration Portal

Welcome, admin

Delete Book

Select book to delete: Learn Chemistry fundamentals (1234567890123)



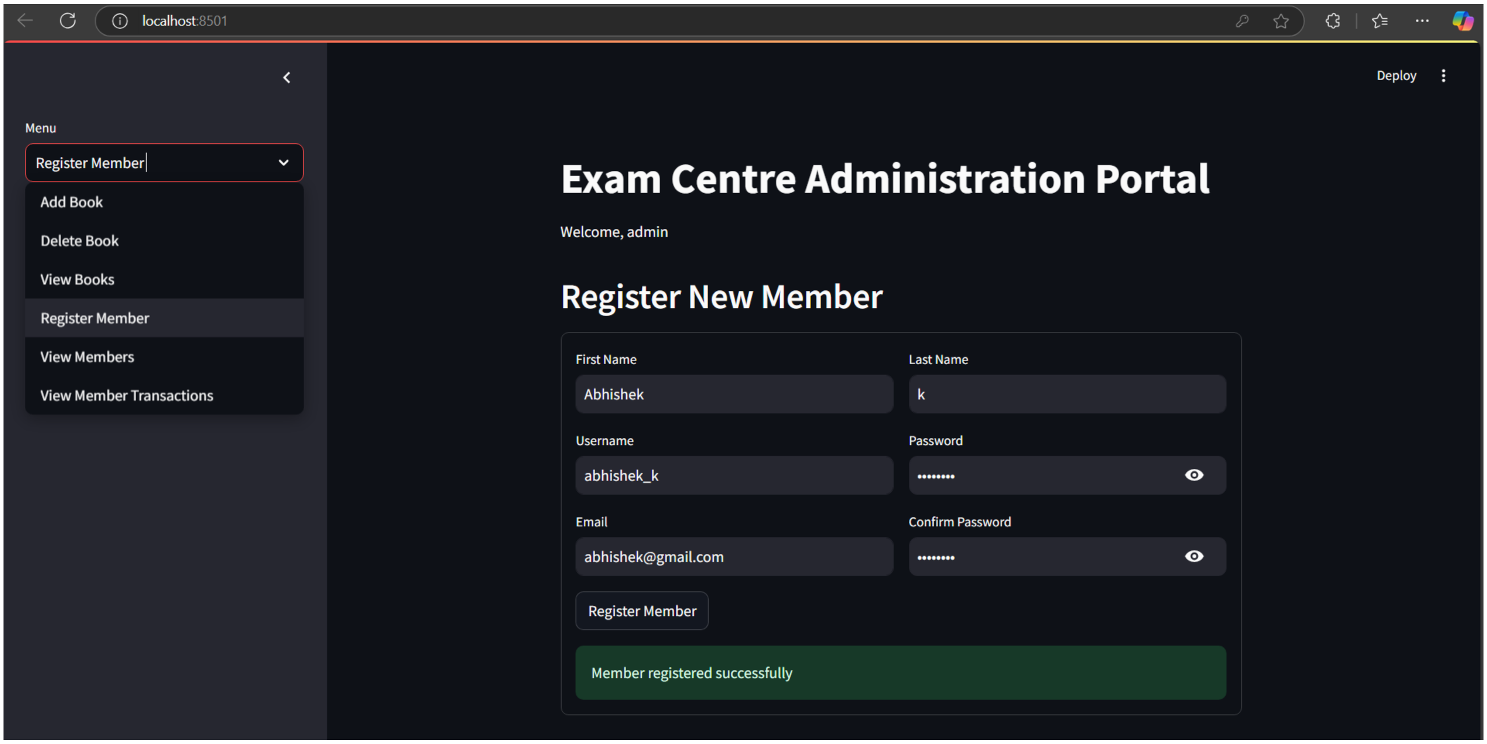
Exam Centre Administration Portal

Welcome, admin

Book Inventory

Search books by title or author

ISBN	Title	Author_Name	Category_
1234567890123	Learn Chemistry fundamentals	Aakanksh Seelin	Chemistry
9780073511184	Chemistry: Principles and Practice	Martin Silberberg	Chemistry
9780198769866	Physical Chemistry: A Molecular Approach	Peter Atkins	Chemistry
9780321803221	Essential Organic Chemistry	Paula Bruice	Chemistry
9781259911111	Chemistry: The Central Science	Raymond Chang	Chemistry
9780072465631	Database Management Systems	Raghu Ramakrishnan	DBMS
9780073523323	Database System Concepts	Abraham Silberschatz	DBMS
9780133970777	Fundamentals of Database Systems	Shamkant Navathe	DBMS
9780321197849	An Introduction to Database Systems	C.J. Date	DBMS



Exam Centre Administration Portal

Welcome, admin

Register New Member

First Name: Abhishek

Last Name: k

Username: abhishek_k

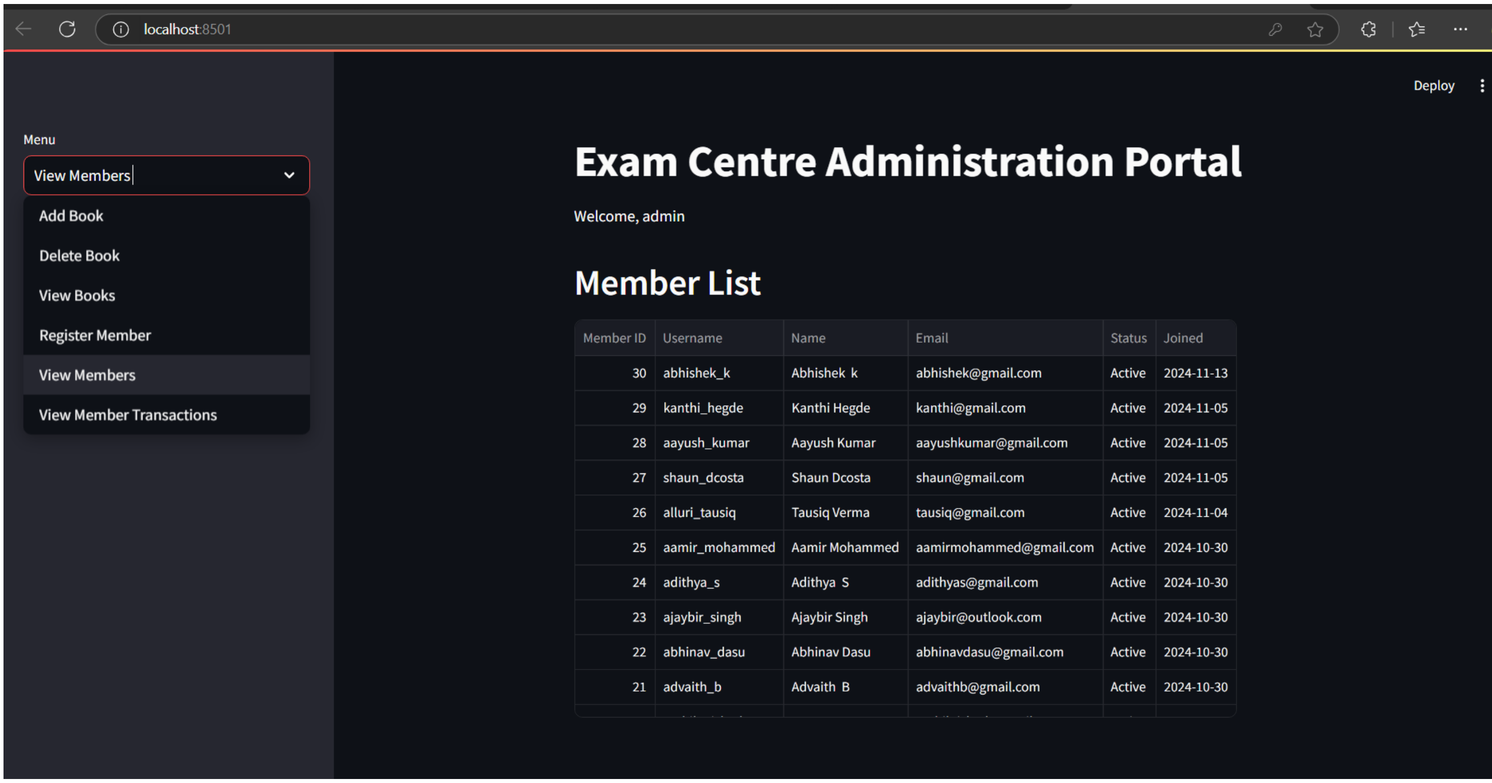
Password: ••••••••

Email: abhishek@gmail.com

Confirm Password: ••••••••

Register Member

Member registered successfully

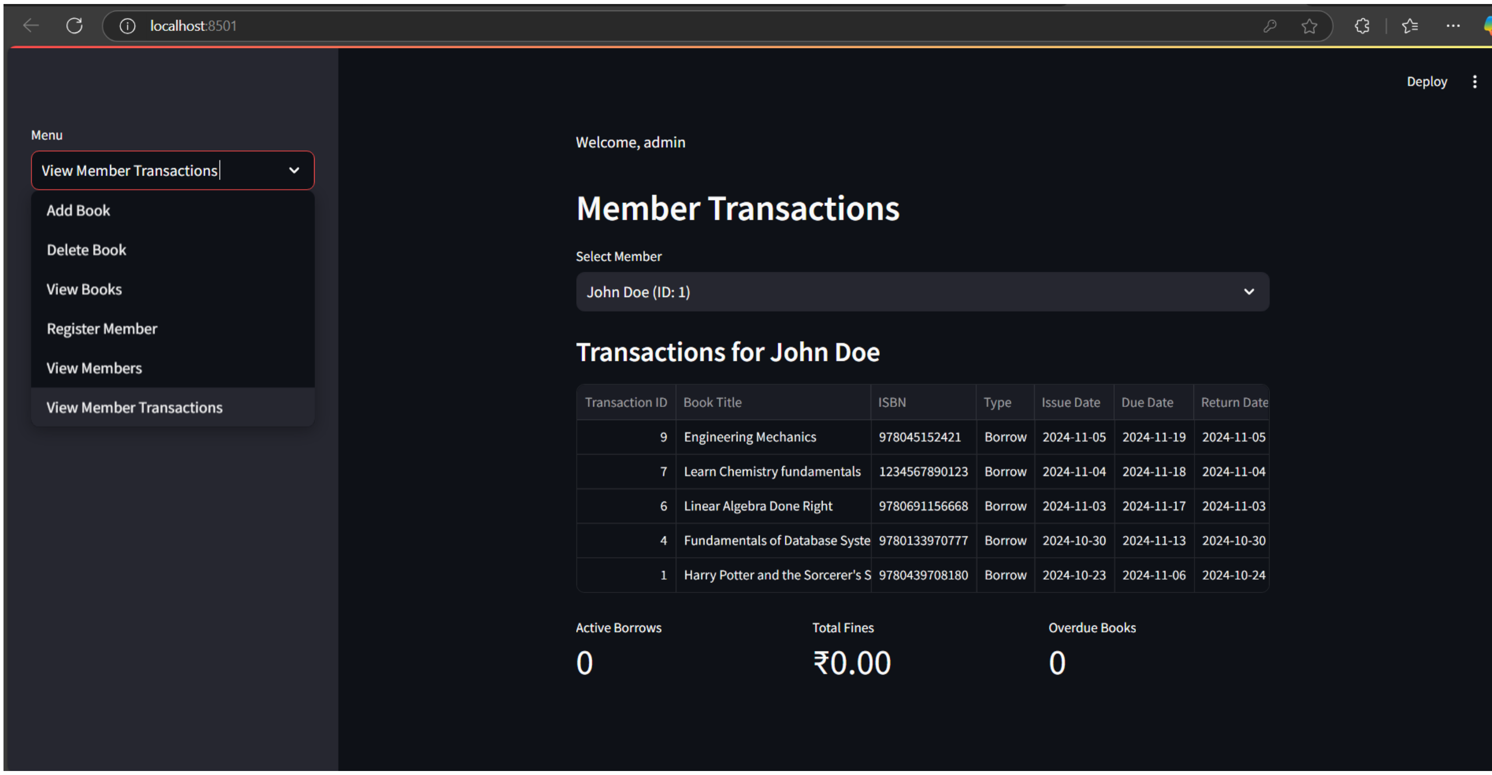


Exam Centre Administration Portal

Welcome, admin

Member List

Member ID	Username	Name	Email	Status	Joined
30	abhishek_k	Abhishek k	abhishek@gmail.com	Active	2024-11-13
29	kanthi_hegde	Kanthi Hegde	kanthi@gmail.com	Active	2024-11-05
28	aayush_kumar	Aayush Kumar	aayushkumar@gmail.com	Active	2024-11-05
27	shaun_dcosta	Shaun Dcosta	shaun@gmail.com	Active	2024-11-05
26	alluri_tausiq	Tausiq Verma	tausiq@gmail.com	Active	2024-11-04
25	aamir_mohammed	Aamir Mohammed	aamirmohammed@gmail.com	Active	2024-10-30
24	adithya_s	Adithya S	adithyas@gmail.com	Active	2024-10-30
23	ajaybir_singh	Ajaybir Singh	ajaybir@outlook.com	Active	2024-10-30
22	abhinav_dasu	Abhinav Dasu	abhinavdasu@gmail.com	Active	2024-10-30
21	advaith_b	Advaith B	advaithb@gmail.com	Active	2024-10-30



Welcome, admin

Member Transactions

Select Member

John Doe (ID: 1)

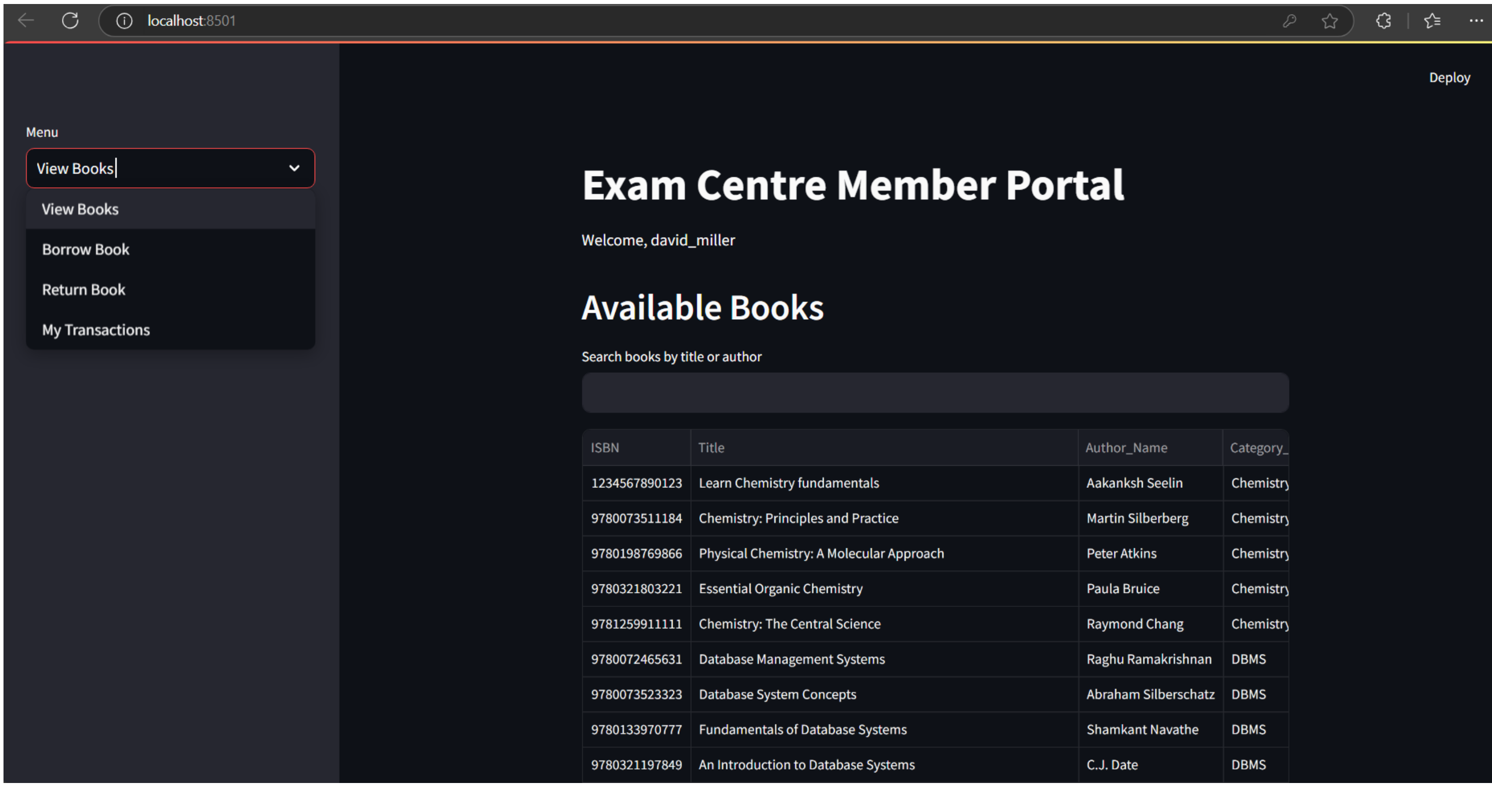
Transactions for John Doe

Transaction ID	Book Title	ISBN	Type	Issue Date	Due Date	Return Date
9	Engineering Mechanics	978045152421	Borrow	2024-11-05	2024-11-19	2024-11-05
7	Learn Chemistry fundamentals	1234567890123	Borrow	2024-11-04	2024-11-18	2024-11-04
6	Linear Algebra Done Right	9780691156668	Borrow	2024-11-03	2024-11-17	2024-11-03
4	Fundamentals of Database Syste	9780133970777	Borrow	2024-10-30	2024-11-13	2024-10-30
1	Harry Potter and the Sorcerer's S	9780439708180	Borrow	2024-10-23	2024-11-06	2024-10-24

Active Borrows	Total Fines	Overdue Books
0	₹0.00	0

4. Member Portal (member_portal()):

- Sidebar menu with options:
  - View Books
  - Borrow Book
  - Return Book
  - My Transactions
- Each section has appropriate forms and data displays
- Logout button in sidebar



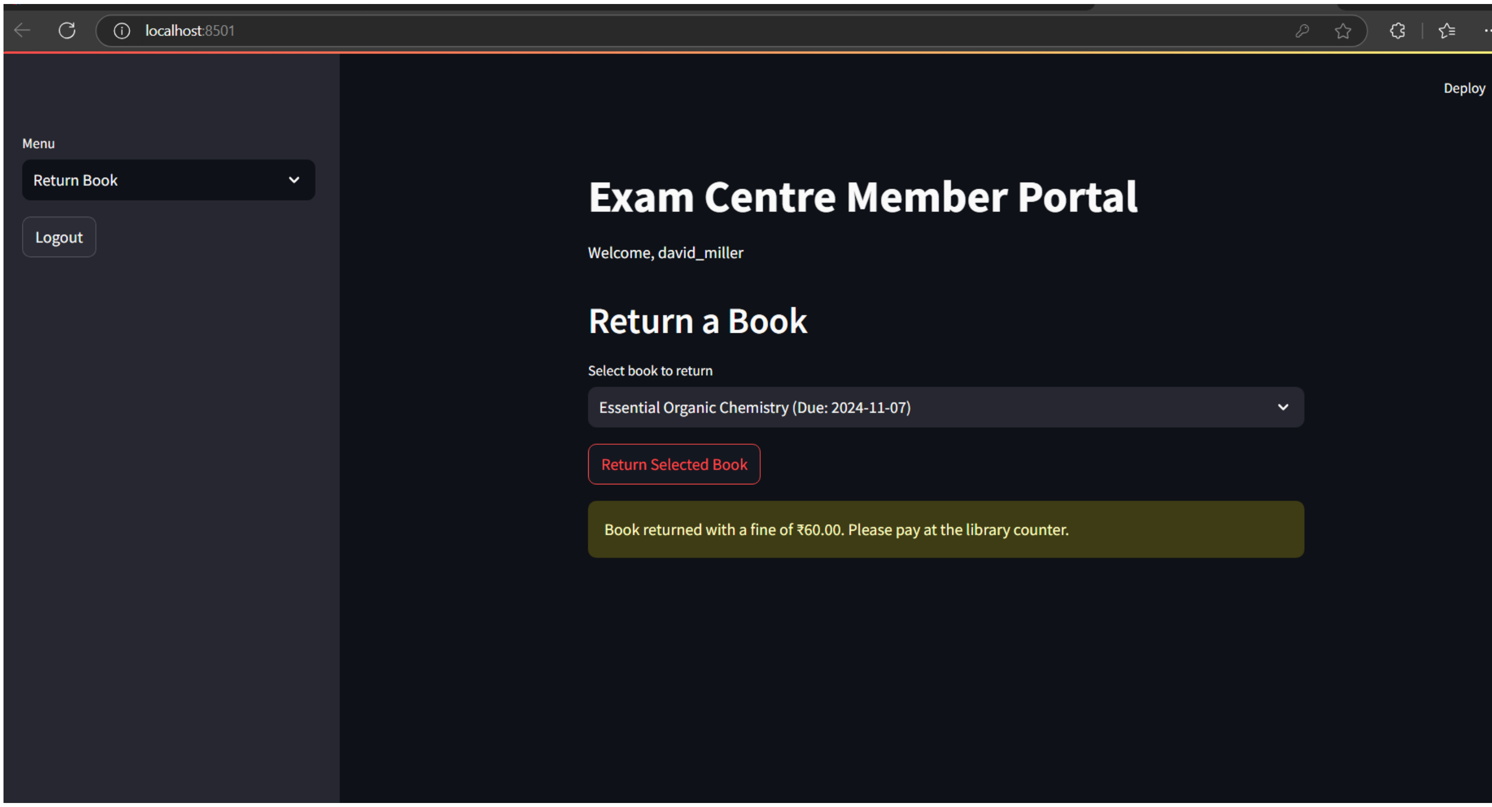
Exam Centre Member Portal

Welcome, david_miller

Available Books

Search books by title or author

ISBN	Title	Author_Name	Category_
1234567890123	Learn Chemistry fundamentals	Aakanksh Seelin	Chemistry
9780073511184	Chemistry: Principles and Practice	Martin Silberberg	Chemistry
9780198769866	Physical Chemistry: A Molecular Approach	Peter Atkins	Chemistry
9780321803221	Essential Organic Chemistry	Paula Bruice	Chemistry
9781259911111	Chemistry: The Central Science	Raymond Chang	Chemistry
9780072465631	Database Management Systems	Raghu Ramakrishnan	DBMS
9780073523323	Database System Concepts	Abraham Silberschatz	DBMS
9780133970777	Fundamentals of Database Systems	Shamkant Navathe	DBMS
9780321197849	An Introduction to Database Systems	C.J. Date	DBMS



Exam Centre Member Portal

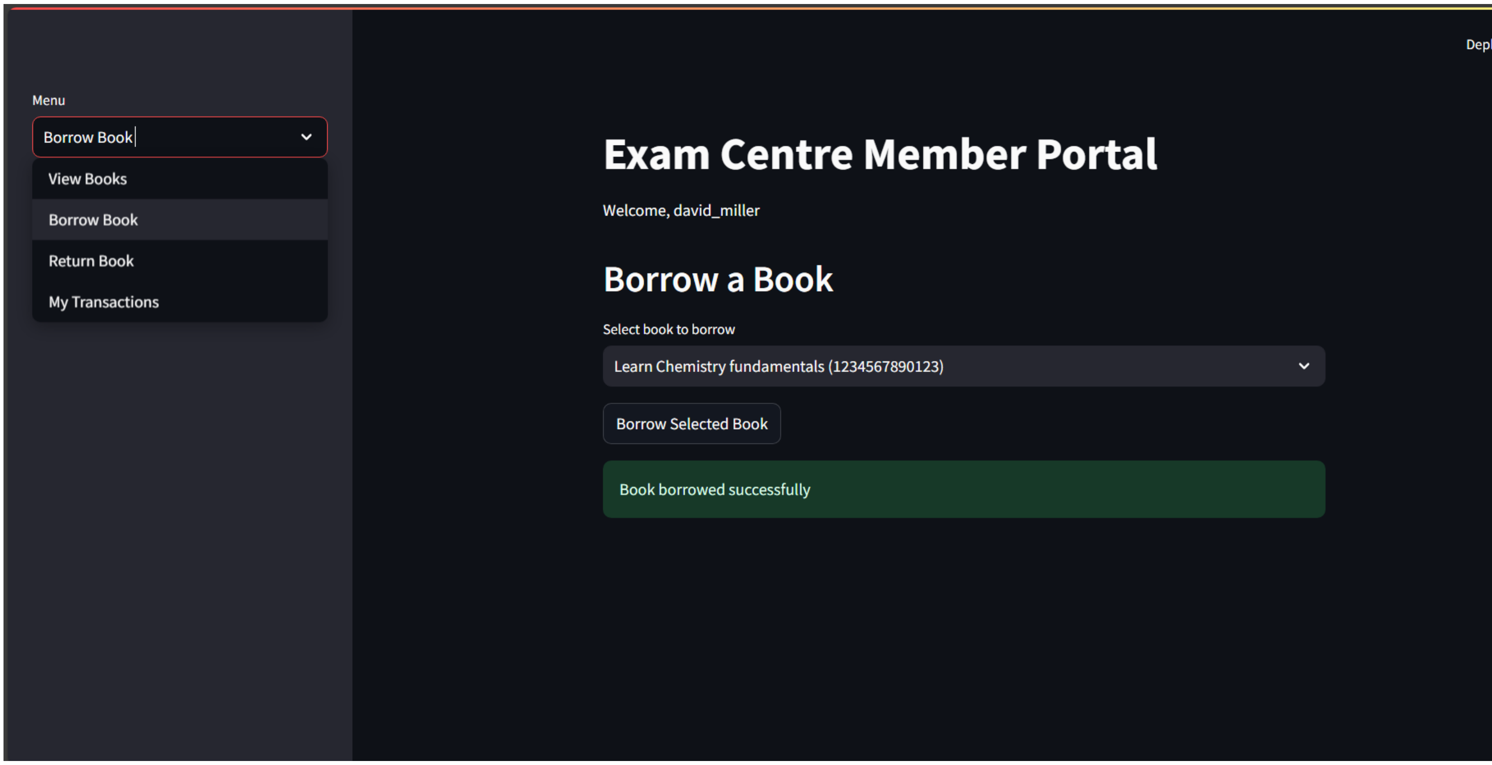
Welcome, david_miller

Return a Book

Select book to return

Essential Organic Chemistry (Due: 2024-11-07)

Book returned with a fine of ₹60.00. Please pay at the library counter.



Exam Centre Member Portal

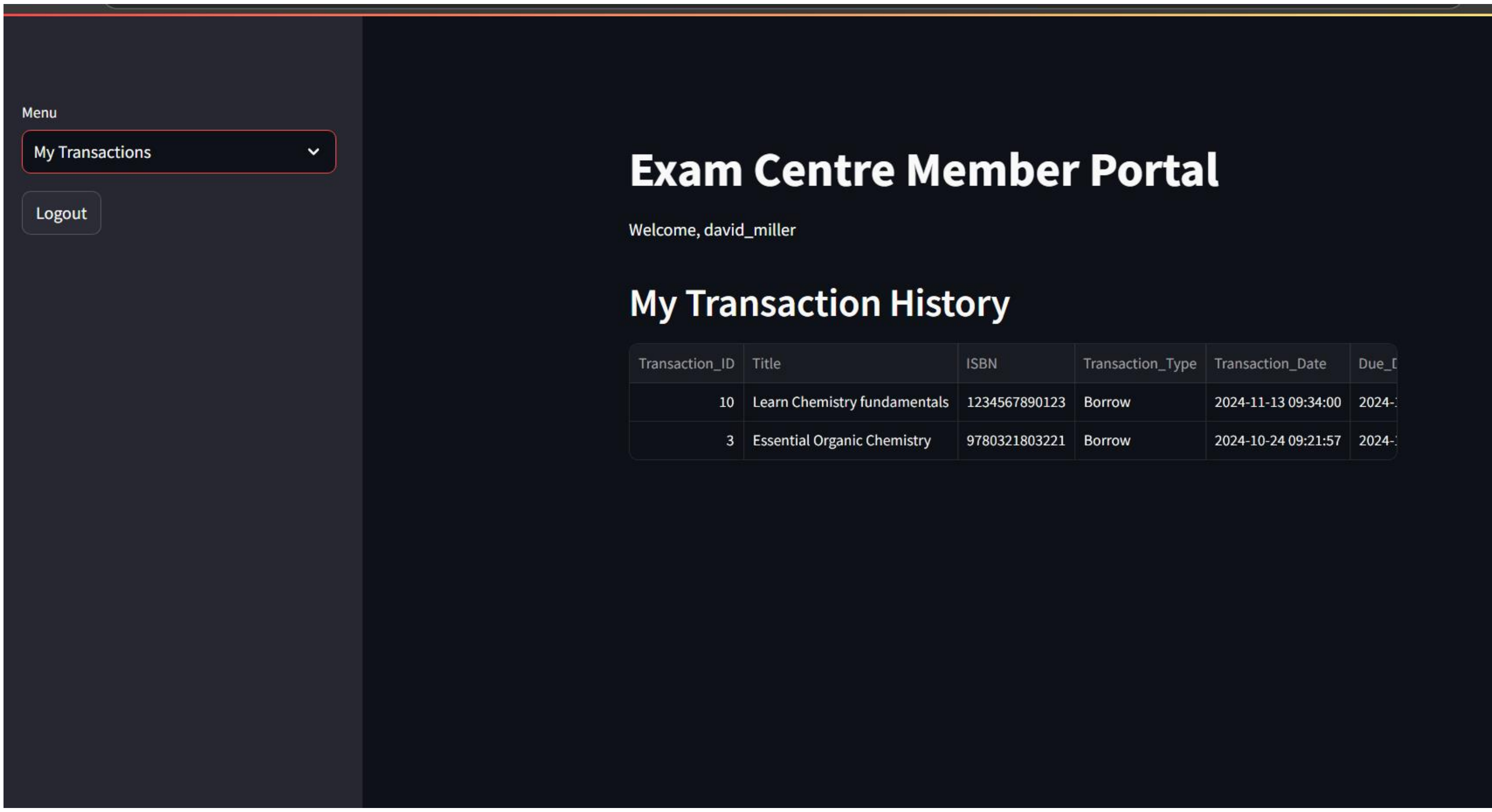
Welcome, david_miller

Borrow a Book

Select book to borrow

Learn Chemistry fundamentals (1234567890123)

Book borrowed successfully



Exam Centre Member Portal

Welcome, david_miller

My Transaction History

Transaction_ID	Title	ISBN	Transaction_Type	Transaction_Date	Due_[
10	Learn Chemistry fundamentals	1234567890123	Borrow	2024-11-13 09:34:00	2024-:
3	Essential Organic Chemistry	9780321803221	Borrow	2024-10-24 09:21:57	2024-: