

LIBRARY MANAGEMENT SYSTEM

ABSTRACT

A college library management is a project that manages and stores books information electronically according to students needs. The system helps both students and library manager to keep a constant track of all the books available in the library. It allows both the admin and the student to search for the desired book. It becomes necessary for colleges to keep a continuous check on the books issued and returned and even calculate fine. This task if carried out manually will be tedious and includes chances of mistakes. These errors are avoided by allowing the system to keep track of information such as issue date, last date to return the book and even fine information and thus there is no need to keep manual track of this information which thereby avoids chances of mistakes. Thus this system reduces manual work to a great extent allows smooth flow of library activities by removing chances of errors in the details.

TABLE OF CONTENTS

CHAPTER NO.

TITLE

ABSTRACT

LIST OF FIGURES

LIST OF TABLES

LIST OF ABBREVIATIONS

1

INTRODUCTION

1.1 OVERVIEW

1.2 PURPOSE

1.3 SCOPE

2

OVERALL DESCRIPTION

2.1 PRODUCT PERSPECTIVE

2.2 PRODUCT FUNCTIONS

3

SPECIFIC REQUIREMENTS

3.1 FUNCTIONAL REQUIREMENTS

3.2 NON FUNCTIONAL REQUIREMENTS

3.3 SOFTWARE REQUIREMENTS

4	SYSTEM DESIGN
	4.1 SYSTEM ARCHITECTURE
	4.2 FLOW DIAGRAM
	4.2.1 ADMIN LOGIN
	4.2.2 BOOK BORROW
	4.2.3 BOOK SEARCH
	4.3 USE CASE DIAGRAM
	4.4 MODULE DESCRIPTION
5	EXPERIMENTAL RESULTS
	5.1 SCREEN SHOTS WITH CAPTIONS
6	TESTING
	6.1 TEST DESIGN
7	CONCLUSION AND FUTURE WORK
	7.1 CONCLUSION

LIST OF FIGURES

FIGURE NO.	FIGURE NAME
4.2	Data Flow Diagram
4.2.1	Admin Login
4.2.2	Book Borrow
4.2.3	Book Search
4.3	Use Case Diagram
5.1.1	Login Page
5.1.2	Main Page
5.1.3	Book Maintenance Page
5.1.4	Book Maintenance page
5.1.5	Author Page
5.1.6	Location Rack
5.1.7	Add Book
5.1.8	Issue Book
5.1.9	Issue Book Details
5.1.10	Fine Amount

LIST OF TABLES

TABLE NO.	TABLE NAME
6.1.1	Login Form
6.1.2	Book Entry Form
6.1.3	User Account Form
6.1.4	Book Issue Form
6.1.5	Book Return Form

LIST OF ABBREVIATIONS

ACRONYMS

DBSA

OPAC

ISBN

HTML

CSS

DOM

RAM

ABBREVIATIONS

Database System Administration

Online Public Access Catalog

International Standard Book Number

Hypertext Markup Language

Cascading Style Sheets

Document Object Model

Random Access Memory

CHAPTER 1

INTRODUCTION

1.1 OVERVIEW:

Library management is a sub-discipline of institutional management that focuses on specific issues faced by libraries and library management professionals. Library management encompasses normal management tasks as well as intellectual freedom, anti-censorship, and fundraising tasks. Issues faced in library management frequently overlap those faced in management of non-profit organizations. Library Management System is an application that portrays library system which could be generally small or medium in size. It is used by the librarian to categorically manage the library by the virtue of using a computerized system where he/she can record various transactions like issue of books, return of books, addition of new books, addition of new students etc. Books and user maintenance modules are also included in this system which would keep track of the users using the library and also a detailed description about the books a library contains. With this computerized system there will be no loss of book record or member record which generally happens when a non-computerized system is used.

1.2 PURPOSE:

The main purpose of this project is to develop a computerized system that will manage the activities in the library thereby providing easy access of library usage for the librarian and users of the library, it will also help librarians keep track of library information etc. This system will also provide electronic means of storage and help librarians keep track of library information.

The objectives are:

- i. Designing a computerized library management system which would help evacuate the problem faced in manual library.
- ii. Implementing the system.
- iii. Evaluating and testing the performance of the system

1.3 SCOPE:

Project product to be produced is a Library Management System which will automate the major library operations. The first subsystem is the registration of the users to the system to keep track of authorized users to the system. The second subsystem is the registration of newbooks into the library management system to know when new books are brought into the library. The third subsystem is a borrower and return of books which is the major area needed by the user. There are three end users for the Library Management System. The end users are the admin, users and members.

CHAPTER 2

OVERALL DESCRIPTION

2.1 PRODUCT PERSPECTIVE:

The library management system is a desktop based application system used by an administrator (Librarian) as an alternative means of record keeping of the books stored in the library. It has the following features.

- i. The administrator registers the applicant with their name as the first and last name, matriculation number, department etc. and a username is being suggested by the user alongside a login password which is to be used for log in by the registered user
- ii. An applicant is allowed to log into the system with his name and generated password which is given at the point of registration.
- iii. The administrator goes into the report to view the details of a particular user.

2.2 PRODUCT FUNCTIONS:

- SIGN UP - Students can register in the platform.
 - LOGIN - Students can login from this page.
 - DASHBOARD - In this page Books Details and Issued Details can be displayed.
 - AUTHOR – In this page Authors details and their book name was displayed.
 - LOCATION RACK – In this page Location of each books is mentioned.
 - BOOK – Book details is displayed.
 - ADD BOOK – Book can be added.
 - ISSUED BOOKS – Issued Books can be displayed.
 - ISSUE BOOK – Books can be issued.
 - LOGOUT – Can be logout from the page.
-

CHAPTER 3

SPECIFIC REQUIREMENTS

3.1 FUNCTIONAL REQUIREMENTS:

DATABASE MANAGEMENT:

Maintain database integrity and keep track of all students information records. This is done by using Firebase. They can able to view every student's details in which they have a access.

USER:

To access the page, users need to have a login ID. Create a new ID to register as a new user. Users can update their information on the platform. Capable of assessing every books and getting each books as rent for the period of time.

SIGN UP:

If user wants to look for the books first need to sign up the page. Once they registered their data is stored in the database.

LOGIN:

If user is already registered, then the page need to be accessed by their User ID for log in purpose and User can able to view the Book details.

RENT:

If user wants to rent a book, they can able to rent for the period of time and return to the management.

ISSUED BOOKS:

Management can view the details of the issued books.

3.2 NON FUNCTIONAL REQUIREMENTS:

- Security.
- Performance.
- Reusability.
- Scalability.
- Extensibility.

3.3 SOFTWARE REQUIREMENTS:

Operating System Windows NT, Windows 98, Windows XP.

Language : Java 2 Runtime Environment.

Database MS Access 2007.

CHAPTER 4

SYSTEM DESIGN

4.1 SYSTEM ARCHITECTURE

REACT.JS

ReactJS tutorial provides basic and advanced concepts of ReactJS. Currently, ReactJS is one of the most popular JavaScript front-end libraries which has a strong foundation and a large community.

ReactJS is a declarative, efficient, and flexible JavaScript library for building reusable UI components. It is an open-source, component-based front end library which is responsible only for the view layer of the application. It was initially developed and maintained by Facebook and later used in its products like WhatsApp & Instagram.

Our ReactJS tutorial includes all the topics which help to learn ReactJS. These are ReactJS Introduction, ReactJS Features, ReactJS Installation, Pros and Cons of ReactJS, ReactJS JSX, ReactJS Components, ReactJS State, ReactJS Props, ReactJS Forms, ReactJS Events, ReactJS Animation and many more.

The main objective of ReactJS is to develop User Interfaces (UI) that improves the speed of the apps. It uses virtual DOM (JavaScript object), which improves the performance of the app.

FIREBASE:

Firebase is a Backend-as-a-Service, and it is a real-time database which is basically designed for mobile applications. This tutorial is designed in such a way that we can easily understand or can perform the service of Firebase in a very efficient way.

Firebase can be used for Android, iOS, Web, or Unity. In this tutorial, we perform Firebase services for Android. So, it is essential to have basic knowledge of Android Studio. A good understanding of basic JAVA and XML is required that allows us to understand the concept of Firebase better.

Firebase manages real-time data in the database. So, it easily and quickly exchanges the data to and from the database. Hence, for developing mobile apps such as live streaming, chat messaging, etc., we can use Firebase.

Firebase allows syncing real-time data across all devices - iOS, Android, and Web - without refreshing the screen.

Firebase provides integration to Google Advertising, AdMob, Data Studio, BigQuery, DoubleClick, Play Store, and Slack to develop our apps with efficient and accurate management and maintenance.

Everything from databases, analytics to crash reports are included in Firebase. So, the app development team can stay focused on improving the user experience.

TAILWIND CSS:

Tailwind CSS can be used to make websites in the fastest and the easiest way.

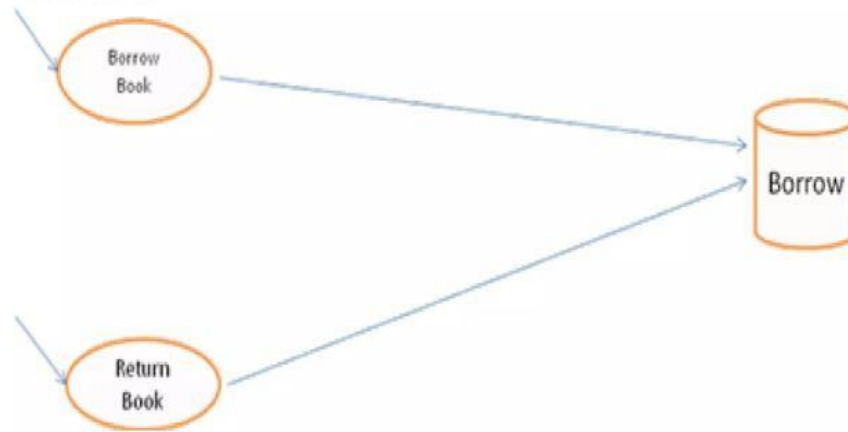
Tailwind CSS is basically a utility-first CSS framework for rapidly building custom user interfaces. It is a highly customizable, low-level CSS framework that gives you all of the building blocks you need to build bespoke designs without any annoying opinionated styles you have to fight to override.

The beauty of this thing called tailwind is it doesn't impose design specification or how your site should look like, you simply bring tiny components together to construct a user interface that is unique. What Tailwind simply does is take a 'raw' CSS file, processes this CSS file over a configuration file, and produces an output.

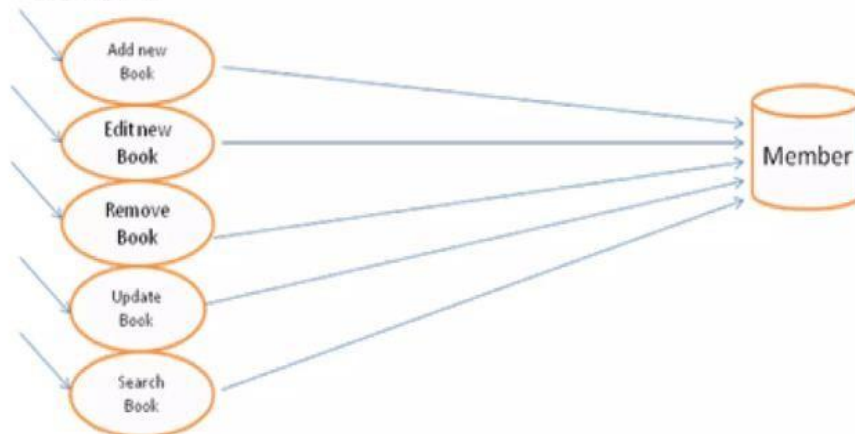
- Faster UI building process
- It is a utility-first CSS framework which means we can use utility classes to build custom designs without writing CSS as in traditional approach.
- Minimum lines of Code in CSS file.
- We can customize the designs to make the components.
- Makes the website responsive.
- Makes the changes in the desired manner.
- CSS is global in nature and if make changes in the file the property is changed in all the HTML files linked to it. But with the help of Tailwind CSS we can use utility classes and make local changes.

4.2 DATA FLOW DIAGRAM:

- Level 1

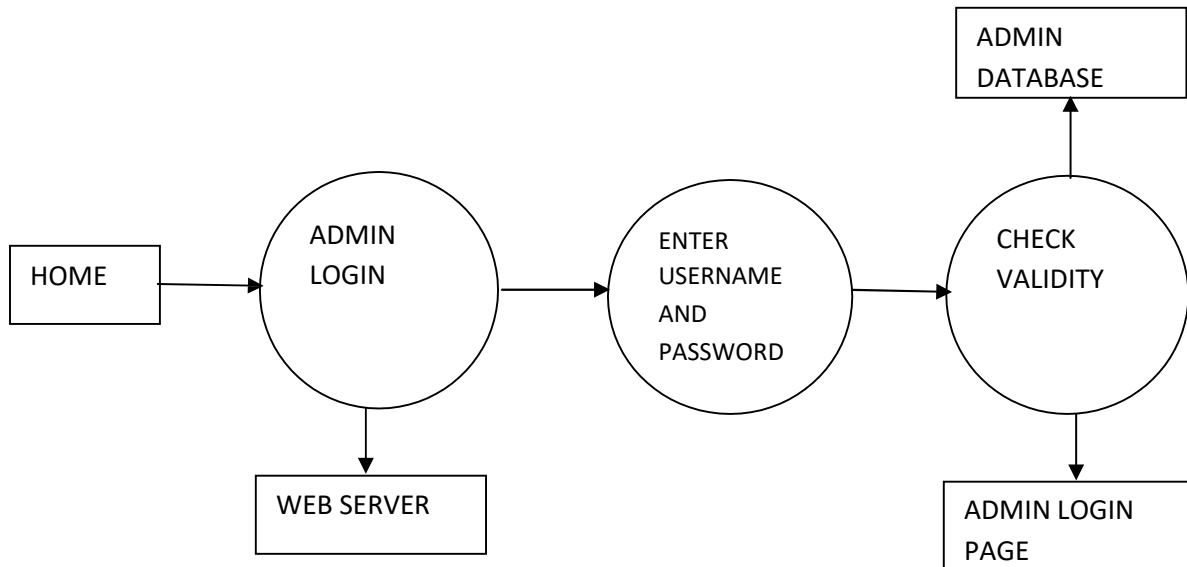


- Level 1



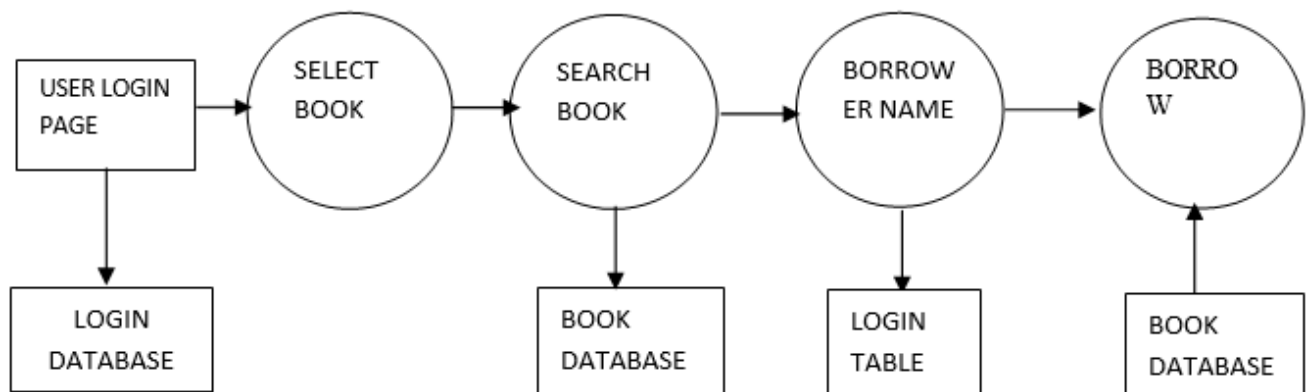
4.2.1 Admin Login:

After entering to the home page of the website, librarian can choose the ADMIN LOGIN option where they are asked to enter username and password, and if he/she is a valid user then a login page will be displayed.



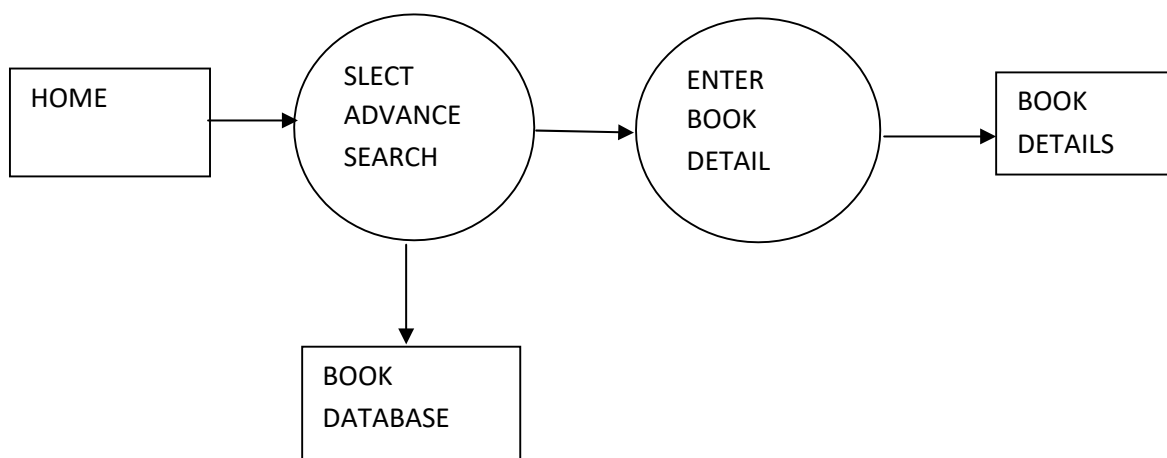
4.2.2 Book Borrow:

The book borrow Data Flow Diagram is the one where after entering USER LOGIN page he/she can select a book borrow option where after entering the book detail, he/she can select the book borrow option and if the maximum no of books borrowed limit is not crossed then a book can be borrowed. A certain user is entitled to borrow three maximum books at a time else the user cannot borrow more than. In the borrowing of books a user will be prompt with the due date.

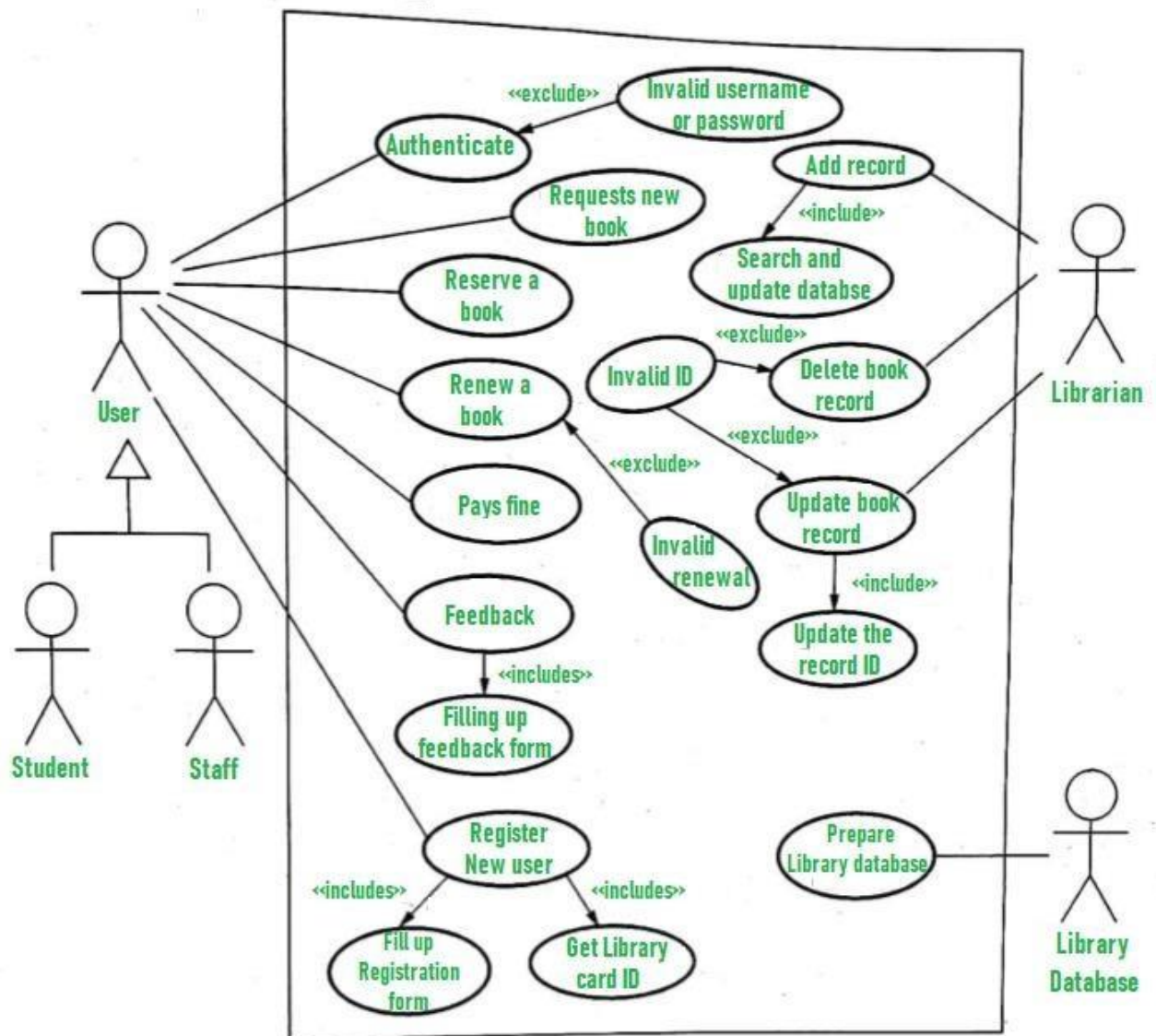


4.2.3 Book Search:

After the home page login there will be an option of the book search where after entering book detail like author name, publication, book name etc. book details will be displayed.



4.3 USE CASE DIAGRAM:



4.4 MODULES

The system categories and follows these modules to implement

Login component

1. Administrator (Head office manager)
2. Librarian
3. User

Administrator Component

1. Administrator

Librarian Manager Component

1. Librarian Manager

Student Component

1. Books Details
2. Issue Details

MODULES DESCRIPTION:-

User: Using login id and password user can use Library online where users can search for books and renew books online. They can recommend for new books by just sending messages to the librarian from anywhere in the college. They can view the issue and return dates of any book and due they have to pay.

Registration: In the Registration module, user has to register himself by supplying his personal information which gets stored in a database which is used as a backend. By registering himself, user will get his login id and Password so that he can access Library online. Separate Register form should be designed for separate user (Student, Faculty, Librarian) and separate login has to be provided for each user. For example, if the users are students then student id should be SH001.

Librarian: Librarian is a person who manages the Library. Librarian has the permission that he can access the database. There are some tasks which are performed by the Librarian like:

- Addition of a new book.
- Modification of the book.
- Deletion of the book.
- Searching of the book.
- Managing User

CHAPTER 5

EXPERIMENTAL RESULTS:

5.1 SCREENSHOTS WITH CAPTIONS:

Normal level user

1. Login Page

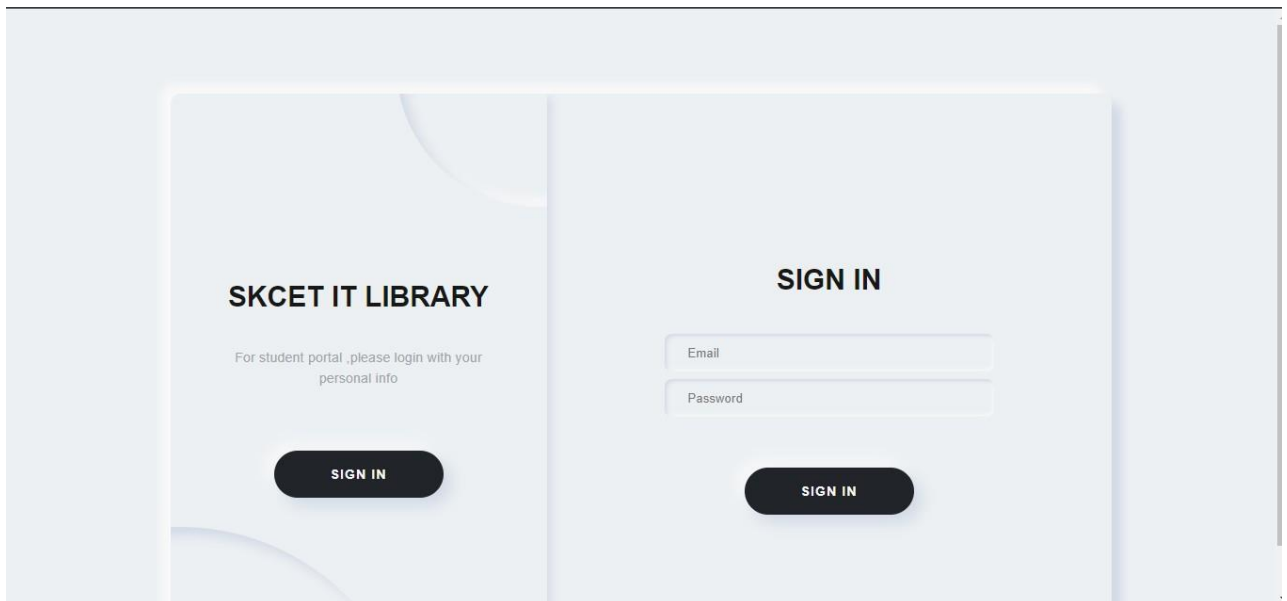


Fig 5.1.1 The login page for librarian and admin. The form is designed ins a colorful interface and is used by the librarian and admin which can be considered as backend. The login interface is designed with ID and password textbox.

2. Main Page

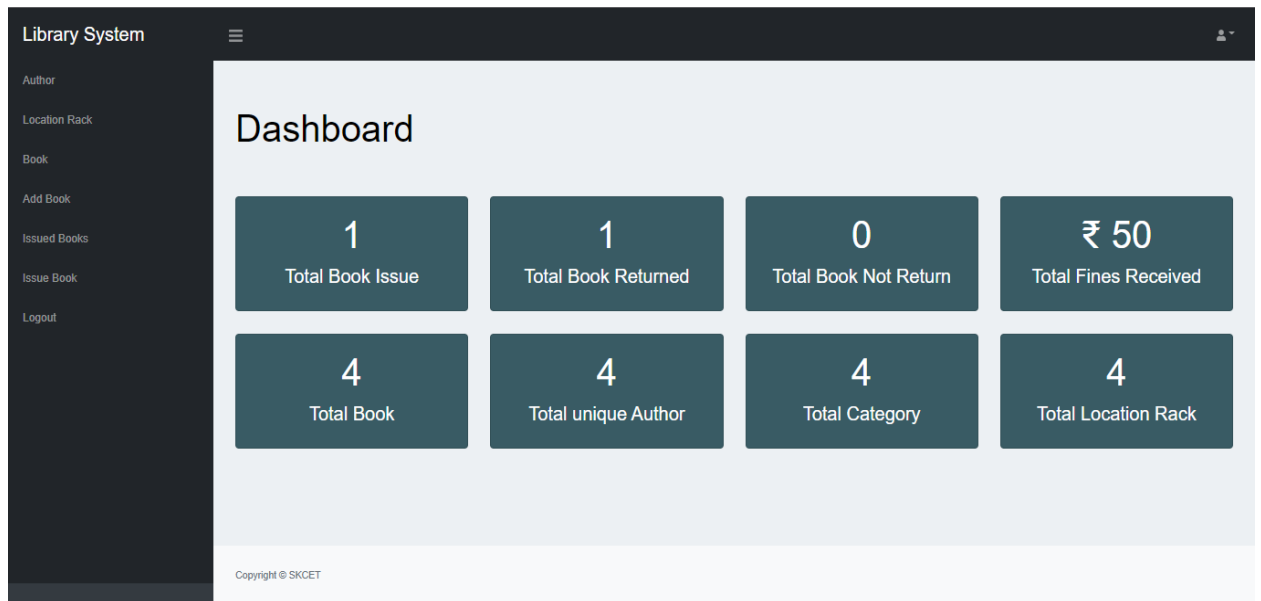


Fig 5.1.2 The main page for library system. In this page we have Total book issue and total book returned , total book not returned , total fine amount received , total available unique authors , unique category, total books location and total book present in the library.

3. Book Maintenance Page

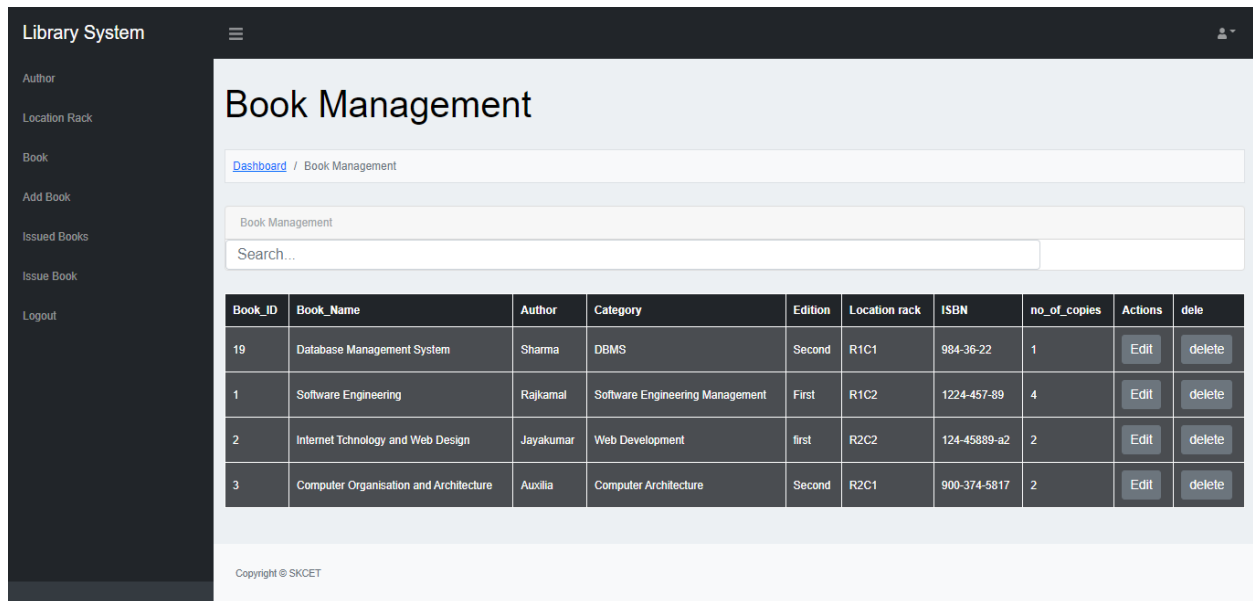


Fig 5.1.3 The book details can be updated and a particular book can also be edited.

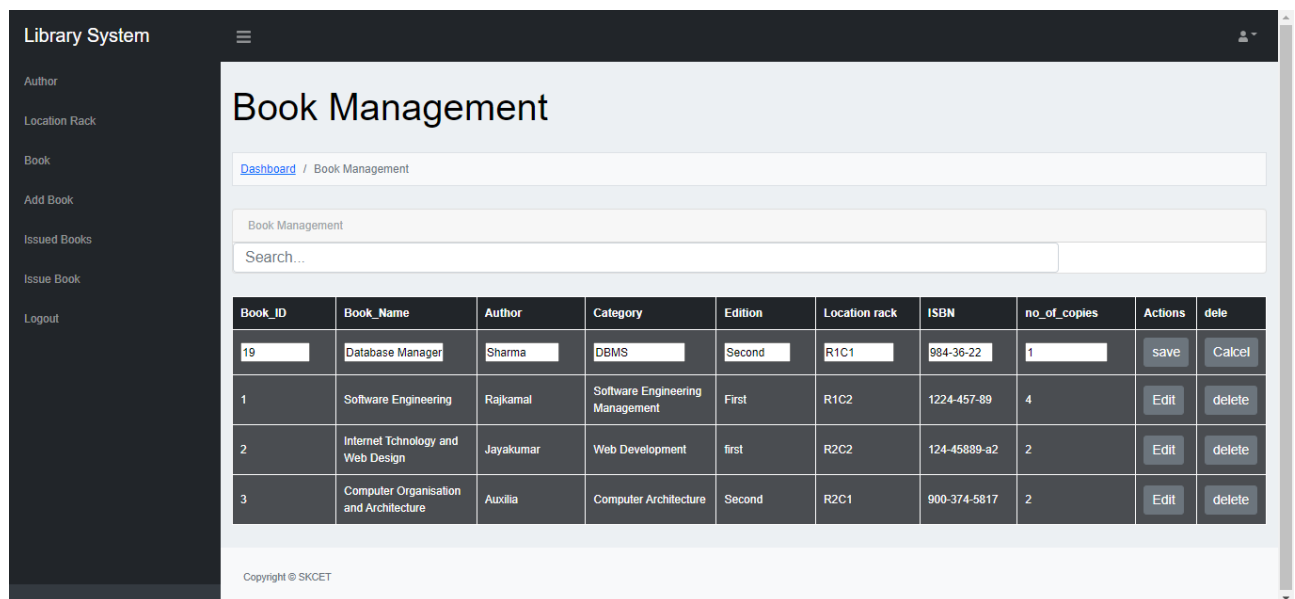


Fig 5.1.4 While clicking the edit button the base dynamically changes like above after editing the details of the book and while clicking the save button the details of the book dynamically changes. If you click the save button by mistake then you can cancel the process.

The main feature here is the search box .We can search the book by their name .the page dynamically changes every time when you change the text in search box.

4. Author

The screenshot shows the 'Author' management page in a 'Library System' web application. On the left is a dark sidebar with navigation links: Author, Location Rack, Book, Add Book, Issued Books, Issue Book, and Logout. The main content area has a header 'Author' and a breadcrumb 'Dashboard / Author Management'. Below the header is a search bar with the placeholder 'Author' and a 'Search' button. A table displays the list of authors with columns 'Book Name' and 'Author Name'. The table contains four rows of data. At the bottom, there is a copyright notice 'Copyright © SKCET'.

Book Name	Author Name
Database Management System	Sharma
Software Engineering	Rajkumar
Internet Technology and Web Design	Jayakumar
Computer Organisation and Architecture	Audilia

Fig 5.1.5 The author page has the list of all unique author names in library. There is a search box, If we search an author in search box the page dynamically changes and displays the results for the text.

5. Location rack

The screenshot shows the 'Location Rack' management page in the same 'Library System' web application. The sidebar is identical to the previous page. The main content area has a header 'Location Rack' and a breadcrumb 'Dashboard / Location Rack Management'. Below the header is a search bar with the placeholder 'Location Rack' and a 'Search...' button. A table displays the list of location racks with columns 'Book Name' and 'Location rack'. The table contains four rows of data. At the bottom, there is a copyright notice 'Copyright © SKCET'.

Book Name	Location rack
Database Management System	R1C1
Software Engineering	R1C2
Internet Technology and Web Design	R2C2
Computer Organisation and Architecture	R2C1

Fig 5.1.6 The location rack has all the details of rack in the library. Here there is a search box, If we search, the page dynamically changes and display the results for the text you have entered.

6 Add Book

The screenshot shows the 'Add Book' form within the 'Book Management' section of the 'Library System'. The left sidebar contains links for Author, Location Rack, Book, Add Book, Issued Books, Issue Book, and Logout. The main content area has a breadcrumb trail: Dashboard / Book Management / Add Book. The form includes input fields for Book Name, Author Name, Select Category, Select Location Rack, Book ISBN Number, No. of Copy (with a value of 0), Book ID, and Book Edition. A green 'Add' button is located at the bottom right of the form.

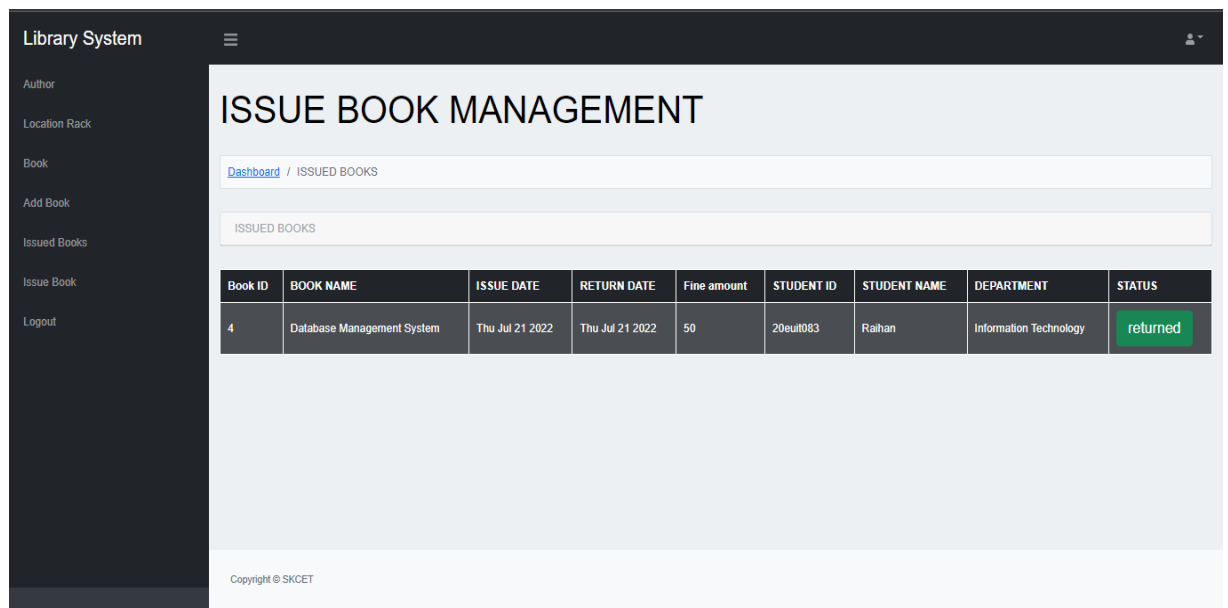
Fig 5.1.7 In the book management page the admin can add a book to the library by giving the details of the book . After entering all the details of the book click ADD button and the book details will be added.

7 Issue book

The screenshot shows the 'Issue Book' form within the 'Book Details and Student Details' section of the 'Library System'. The left sidebar contains links for Author, Location Rack, Book, Add Book, Issued Books, Issue Book, and Logout. The main content area has a breadcrumb trail: Dashboard / Issue Book Management / Issue New Book. The form includes input fields for Book Name, Book ID, Roll No., Student Name, and Department. A green 'Issue' button is located at the bottom right of the form.

Fig 5.1.8 To issue a book to the student, the admin has to enter the ISBN NO. and details of the book and the student can click ISSUE button then the details are added on the issue book details page.

8 Issue book details



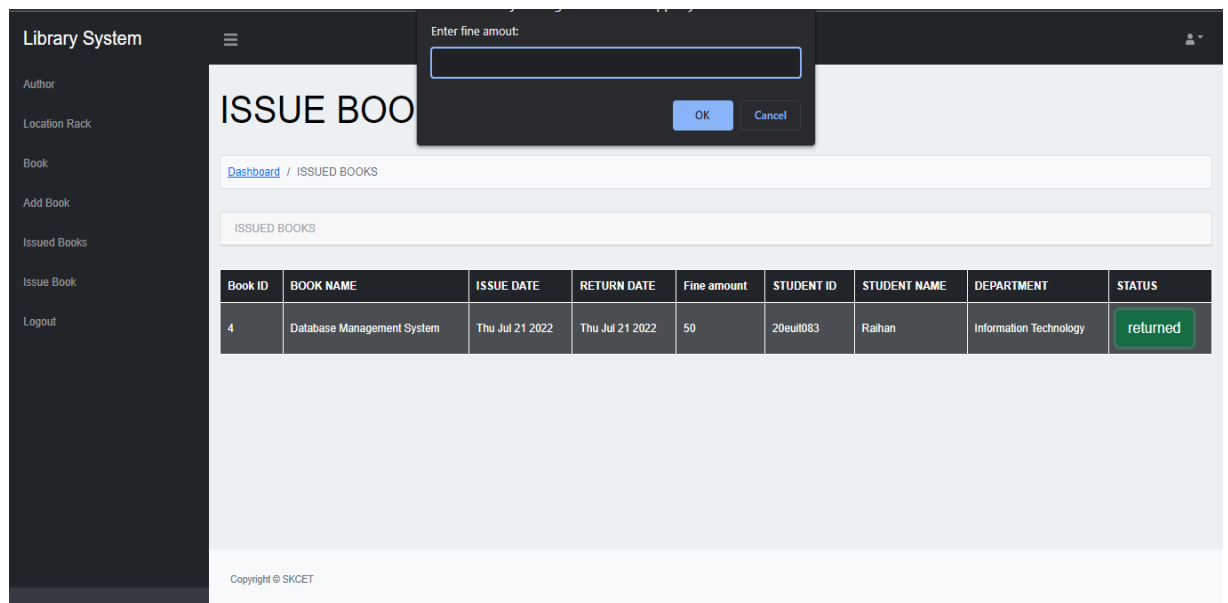
The screenshot shows the 'Library System' interface with a sidebar menu on the left containing: Author, Location Rack, Book, Add Book, Issued Books, Issue Book, and Logout. The main content area is titled 'ISSUE BOOK MANAGEMENT' and includes a breadcrumb trail 'Dashboard / ISSUED BOOKS'. Below this is a search bar labeled 'ISSUED BOOKS'. A table displays the following data:

Book ID	BOOK NAME	ISSUE DATE	RETURN DATE	Fine amount	STUDENT ID	STUDENT NAME	DEPARTMENT	STATUS
4	Database Management System	Thu Jul 21 2022	Thu Jul 21 2022	50	20euit083	Raihan	Information Technology	returned

At the bottom of the page, it says 'Copyright © SKCET'.

Fig 5.1.9 The admin can see the status of the book here whether the book has been returned or not.

9 Fine amount



This screenshot is similar to Fig 5.1.9 but includes a modal dialog box titled 'Enter fine amount:'. The dialog has a text input field and two buttons: 'OK' and 'Cancel'. The table below the dialog shows the same data as in Fig 5.1.9:

Book ID	BOOK NAME	ISSUE DATE	RETURN DATE	Fine amount	STUDENT ID	STUDENT NAME	DEPARTMENT	STATUS
4	Database Management System	Thu Jul 21 2022	Thu Jul 21 2022	50	20euit083	Raihan	Information Technology	returned

The sidebar and footer are identical to the previous figure.

Fig 5.1.10 After the student has returned the book the admin can change the status of the book. The admin can also assign the fine amount.

CHAPTER 6

TESTING

Testing is a process of executing a program with the intent of finding an error. Testing is a crucial element of software quality assurance and presents ultimate review of specification, design and coding.

System Testing is an important phase. Testing represents an interesting anomaly for the software. Thus a series of testing are performed for the proposed system before the system is ready for user acceptance testing.

A good test case is one that has a high probability of finding an as undiscovered error. A successful test is one that uncovers an as undiscovered error.

Testing Objectives:

- Testing is a process of executing a program with the intent of finding an error
- A good test case is one that has a probability of finding an as yet undiscovered error
- A successful test is one that uncovers an undiscovered error

Testing Principles:

- All tests should be traceable to end user requirements
 - Tests should be planned long before testing begins
 - Testing should begin on a small scale and progress towards testing in large
 - Exhaustive testing is not possible
 - To be most effective testing should be conducted by a independent third party
-

6.1 TEST DESIGN:

6.1.1

LOGIN FORM:

SL.No	Test Case	Excepted Result	Test Result
1	Enter valid name and password & click on login button	Software should display main window	Successful
2	Enter invalid	Software should not display main window	successful

6.1.2

BOOK ENTRY FORM:

SL.No	Test Case	Excepted Result	Test Result
1	On the click of ADD button	At first user have to fill all fields with proper data , if any Error like entering text data instead of number or entering number instead of text..is found then it gives proper message otherwise Adds Record To the Database	successful
2.	On the Click of DELETE Button	This deletes the details of book by using Accession no.	Successful
3.	On the Click of UPDATE Button	Modified records are Updated in database by clicking UPDATE button.	Successful
4.	On the Click of SEARCH Button	Displays the Details of book for entered Accession no. Otherwise gives proper Error message.	Successful
5.	On the Click of CLEAR Button	Clears all fields	Successful
6.	On the Click of EXIT button	Exit the current book details form	successful
7.	On the Click of NEXT button	Display the next form	successful

6.1.3

USER ACCOUNT FORM:

SL.No	Test Case	Excepted Result	Test Result
1	On the click of ADD button	At first user have to fill all fields with proper data , if any Error like entering text data instead of number or entering number instead of text..is found then it gives proper message otherwise Adds Record To the Database	successful
2.	On the Click of DELETE Button	This deletes the details of student by using Register no.	Successful
3.	On the Click of UPDATE Button	Modified records are Updated in database by clicking UPDATE button.	Successful
4.	On the Click of SEARCH Button	Displays the Details of book for entered Register no. Otherwise gives proper Error message.	Successful
5.	On the Click of CLEAR Button	Clears all fields	Successful
6.	On the Click of EXIT button	Exit the current book details form	successful

6.1.4

BOOK ISSUE FORM:

SL.No	Test Case	Excepted Result	Test Result
1	On the click of ADD button	At first user have to fill all fields with proper data ,if the accession number book is already issued then it will giving proper msg.	successful
2.	On the Click of DELETE Button	This deletes the details of book by using Register no.	Successful
3.	On the Click of UPDATE Button	Modified records are Updated in database by clicking UPDATE button.	Successful
4.	On the Click of SEARCH Button	Displays the Details of issued book..Otherwise gives proper Error message.	Successful
5.	On the Click of CLEAR Button	Clears all fields	Successful
6.	On the Click of EXIT button	Exit the current book details form	successful

6.1.5

BOOK RETURN FORM:

SL.No	Test Case	Excepted Result	Test Result
1	On the click of ADD button	At first user have to fill all fields with proper data , if any Error like entering text data instead of number or entering number instead of text..is found then it gives proper message otherwise Adds Record To the Database	successful
2.	On the Click of DELETE Button	Which deletes the details of book by using Register no.	Successful
3.	On the Click of UPDATE Button	Modified records are Updated in database by clicking UPDATE button.	Successful
4.	On the Click of SEARCH Button	Displays the Details of returned book ... Otherwise gives proper Error message.	Successful
5.	On the Click of CLEAR Button	Clears all fields	Successful
6.	On the Click of EXIT button	Exit the current book details form	successful
7.	On the Click of NEXT button	Display the next form	successful

CHAPTER - 7

CONCLUSION

7.1 CONCLUSION

This website provides a computerized version of library management system which will benefit the students as well as the staff of the library. It makes entire process online where student can search books, staff can generate reports and do book transactions. It also has a facility for student login where student can login and can see status of books issued as well request for book or give some suggestions. It has a facility of teacher's login where teachers can add lectures notes and also give necessary suggestion to library and also add info about workshops or events happening in our college or nearby college in the online notice board.

RAHUL M.S,

SRI KRISHNA COLLEGE OF ENGINEERING AND TECHNOLOGY.
