

E-Library Management System

Project thesis submitted in partial fulfillment of major project for VIII Semester
B. Tech in Computer Science and Engineering

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Certificate

This is to certify that the project thesis entitled E-Library Management System being submitted

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In partial fulfillment for the major project in Computer Science and Engineering to the Jawaharlal Nehru Technological University Kakinada, Kakinada is a record of bonafide work carried out under my guidance and supervision. The results embodied in this project thesis have not been submitted to any other University or Institute for the award of any Degree or Diploma.

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ABSTRACT

E-Library Management System is an application for assisting both the librarian in managing the books in a college library and the student in finding out the availability of books, knowing their deadlines and dues over the books. This system provides a set of functionalities such as add/update members, add/update books, issue the books, retrieve the books, generate timely warnings for book submissions through email, generating and collecting fines in case of late submissions through payment gateways.

E-Library Management System is a full-stack web application, its development includes the establishment and maintenance of back-end Django framework supported with MySQL database, designing and creating front-end UI interface using HTML, CSS, JavaScript and Bootstrap, and hosting the web application in any suitable server.

TABLE OF CONTENTS

1. INTRODUCTION.....	1
2. LITERATURE SURVEY.....	2
2.1 EXISTING SYSTEM.....	2
2.2 PROPOSED SYSTEM.....	2
3. SYSTEM ANALYSIS.....	3
3.1 NON-FUNCTIONAL REQUIREMENTS.....	3
3.1.1 PRODUCT REQUIREMENTS.....	3
3.1.2 ORGANISATIONAL REQUIREMENTS.....	3
3.2 FUNCTIONAL REQUIREMENTS.....	3
3.3 SOFTWARE REQUIREMENTS.....	4
3.4 HARDWARE REQUIREMENTS.....	4
3.5 TECHNOLOGY STACK.....	5
4. SYSTEM DESIGN.....	10
4.1 ACTIVITY DIAGRAM.....	10
4.2 UML DIAGRAMS.....	11
4.2.1 USECASE DIAGRAM.....	11
4.2.2 CLASS DIAGRAM.....	12
4.3 DATABASE DIAGRAM.....	13
5. CODING TEMPLATE.....	14
5.1 VIEW FUNCTIONS.....	14
5.2 JAVASCRIPT FUNCTIONS.....	16
6. TESTING.....	17
6.1 UNIT TESTING.....	17
6.2 INTEGRATION TESTING.....	21
7. IMPLEMENTATION & ERROR HANDLING.....	22
8. CONCLUSION & FUTURE SCOPE.....	45
9. REFERENCES.....	46

1. INTRODUCTION

E-Library Management System that offers many flexible and convenient features, allowing librarians and library users to minimize time and maximize efficiency. Due to computerized information it reduces the risk of paperwork such as file lost and file damaged

Features of E-Library Management System:

1. Add/Update members
2. Add/Update books
3. Issue the books
4. Retrieve the books
5. Generate timely warnings for book submissions through email
6. Generating fines and collecting payments in case of late submissions through payment gateways.

2. LITERATURE SURVEY

2.1 EXISTING SYSTEM:

- In early days, libraries are managed manually. It required lot of time to record or to retrieve the details.
- The Librarians who have to record the details must perform their job very carefully. Security of information is very less.
- Maintenance of Library catalogue and arrangement of the books to the catalogue is very complex task.
- All the operations must be performed in perfect manner for the maintenance of the library or else it will result in the failure of the entire system.

2.2 PROPOSED SYSTEM:

To solve the inconveniences as mentioned in the existing system, an Online Library is proposed.

The proposed system contains the following features:

- Each member will have his account through which he can access the information he needs.
- Book details like authors, number of copies totally maintained by library, present available number of books, etc. all this information can be made handy.
- Regarding the members designation, a number of books were issued.
- Issue dates and returns of each member are maintained separately and fine charged if there is any delay in returning the book.
- Administrator can add, update the books.
- Time consuming is low, gives accurate results, reliability can be improved with the help of security.

3. SYSTEM ANALYSIS

3.1 NON-FUNCTIONAL REQUIREMENTS

3.1.1 PRODUCT REQUIREMENTS

- **EFFICIENCY REQUIREMENT**

When a library management system will be implemented, librarians and users will easily access libraries as searching and book transactions will be much faster.

- **RELIABILITY REQUIREMENT**

The system should accurately perform the member validation, report generation, book transaction and search queries.

- **USABILITY REQUIREMENT**

The system is designed for a user-friendly environment so that students and staff of the library can perform the various tasks easily and in an effective way.

3.1.2 ORGANIZATIONAL REQUIREMENTS

- **IMPLEMENTATION REQUIREMENTS**

In implementing the whole system, it uses HTML, CSS, JavaScript, Bootstrap in front end with Python as server-side scripting language which will be used for database connectivity and the backend i.e., the database part is developed using MySQL.

3.2 FUNCTIONAL REQUIREMENTS

- User Login System
- Issue/Submit Book

- Search Student Profile
- View Profile
- Search Book
- Make Payment
- Send Notifications
- Reset Password
- Add, Delete or Update Books
- Generate Fines
- Provide OTP Service

3.3 SOFTWARE REQUIREMENTS

- Git - collaborating and version controlling tool
- Python - 3.6.x
- Pip - python package manager
- Virtualenv (venv) - python virtual environment module
- Django - python based backend framework
- Requests - python http request module
- Mysqclient - mysql driver for database connectivity
- Xampp - fullstack web development tool
- Visual Studio code - project code editor
- Chrome browser - for testing the web pages

3.4 HARDWARE REQUIREMENTS

- 1 GB RAM
- 1 CPU CORE
- 24 GB memory of SSD or HDD

3.5 TECHNOLOGY STACK and TOOLS USED

- **HTML and TEMPLATE LANGUAGE**

HTML is used to create electronic documents (called pages) that are displayed on the World Wide Web. Each page contains a series of connections to other pages called hyperlinks. Every web page you see on the Internet is written using one version of HTML code or another. The Template Language is a kind of mark-up language used to create html pages dynamically. The syntax of template language is { % YOUR CODE % }. The syntax for every structure in template language is almost similar to that of Python language except every open tag is enclosed with an end tag. It can be easily read over the Internet.



- **CSS (Cascading Style Sheet)**

CSS is the language for describing the presentation of Web pages, including colors, layout, and fonts. It allows one to adapt the presentation to different types of devices, such as large screens, small screens, or printers. CSS is independent of HTML and can be used with any XML-based markup language.



- **JAVASCRIPT**

JavaScript is a text-based programming language used both on the client-side and server-side that allows you to make web pages interactive. Where HTML and CSS are languages that give structure and style to web pages, JavaScript gives web pages interactive elements that engage a user.



- **BOOTSTRAP**

Bootstrap is used for developing a responsive and mobile friendly website. It includes HTML and CSS based design templates for typography, forms, buttons, tables, navigation, and many others. It can also use JavaScript plug-ins. It facilitates you to create responsive designs.



Bootstrap

- DJANGO

Django is an extremely popular and fully featured server-side web framework, written in Python. It can run on any platform. Django includes various helping task modules and libraries which can be used to handle common Web development tasks. Django takes care of user-authentication, content administration etc.



- MySQL

MySQL is a relational database management system based on SQL – Structured Query Language. The most common use for MySQL however, is for the purpose of a web database.



- **GIT and GITHUB**

Git is a free and open source distributed version control system designed to handle everything from small to very large projects with speed and efficiency. Git is software for tracking changes in any set of files, usually used for coordinating work among programmers collaboratively developing source code during software development.

GitHub is a Git repository hosting service, but it adds many of its own features. While Git is a command line tool, GitHub provides a Web-based graphical interface. It also provides access control and several collaboration features, such as a wikis and basic task management tools for every project.

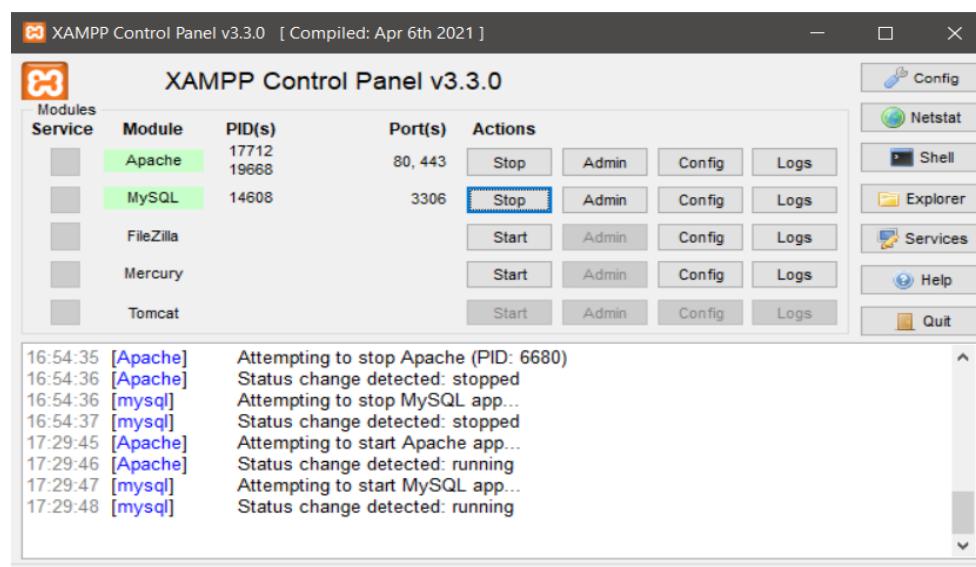


- XAMPP

XAMPP is a free and open-source cross-platform web server solution stack package developed by Apache Friends, consisting mainly of the Apache HTTP Server, MariaDB database, and interpreters for scripts written in the PHP and Perl programming languages. Originally the MySQL is the supporting database, but it was replaced by MariaDB database. Although, it was replaced XAMPP still supports MySQL server. In view of the project, XAMPP server is used for hosting the database server.

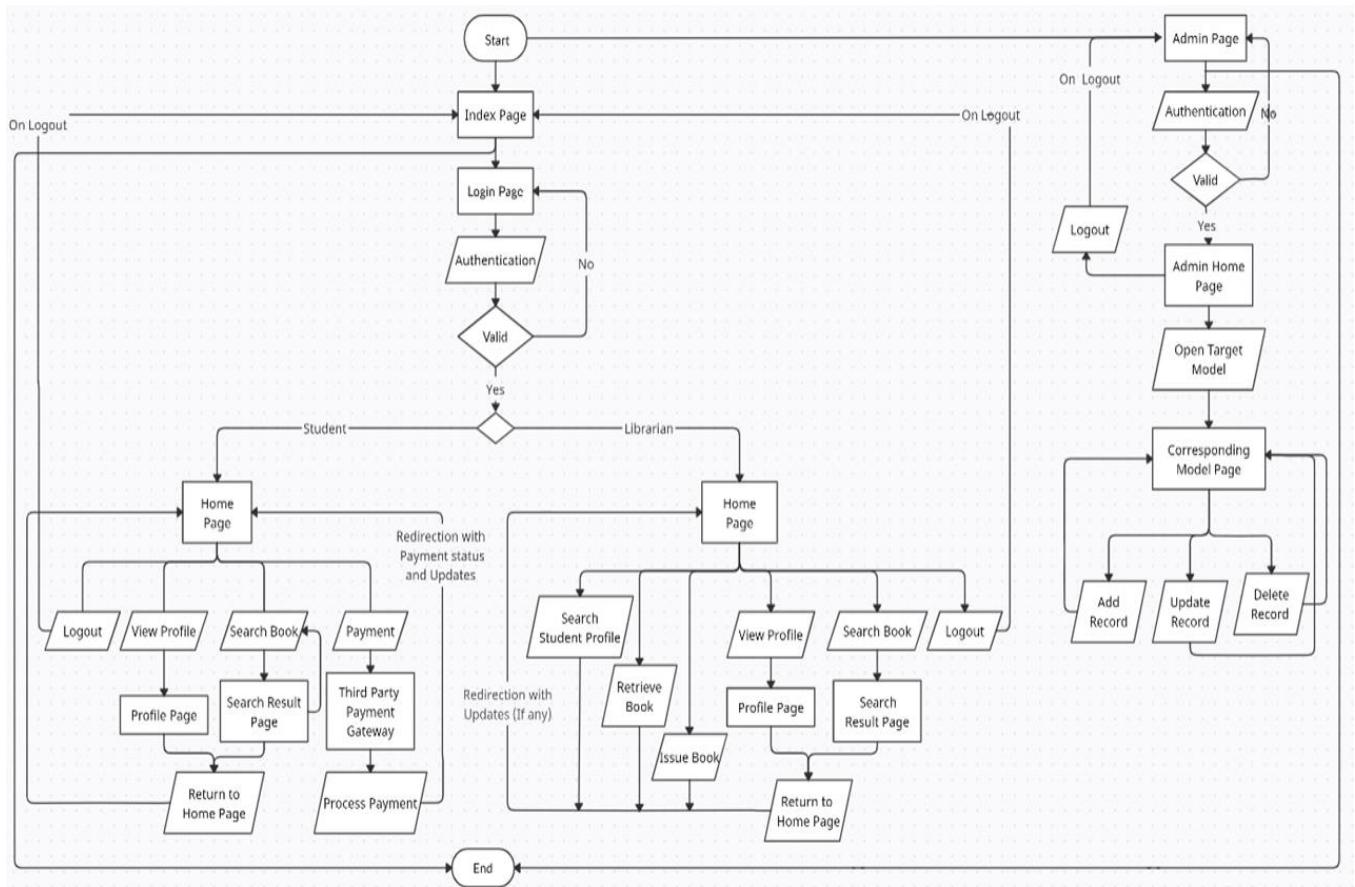


XAMPP



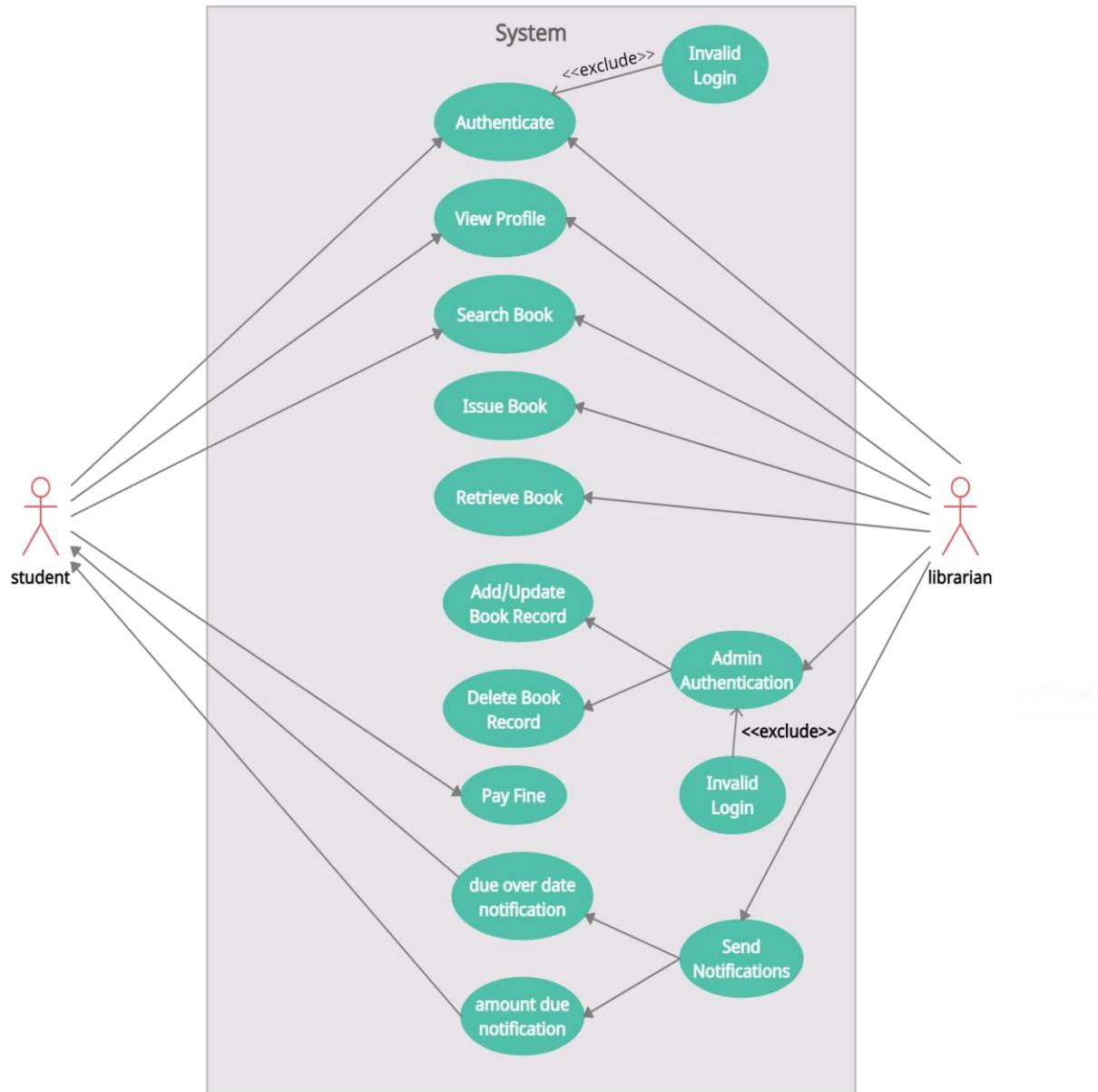
4. SYSTEM DESIGN

4.1. ACTIVITY DIAGRAM

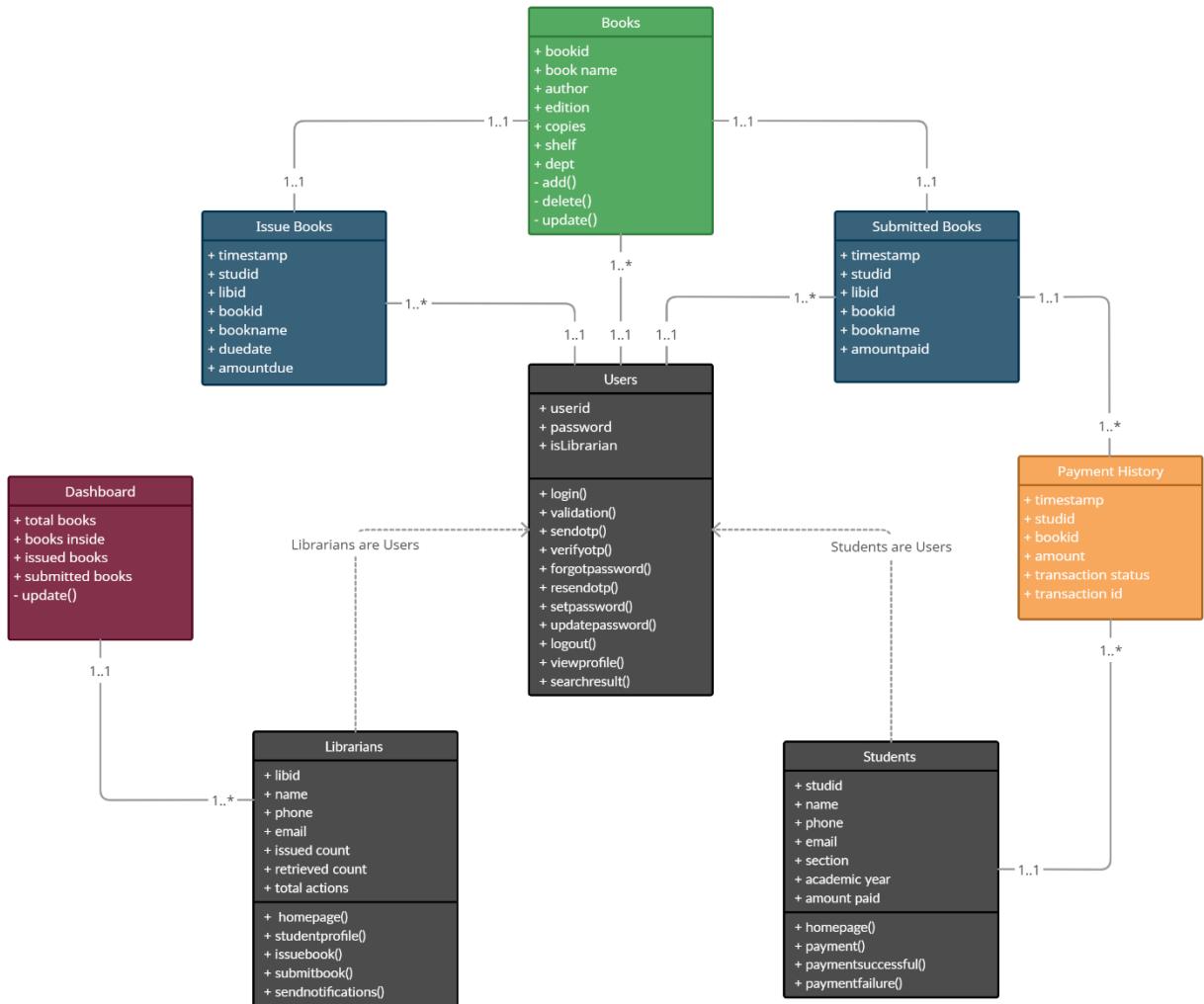


4.2 UML DIAGRAMS

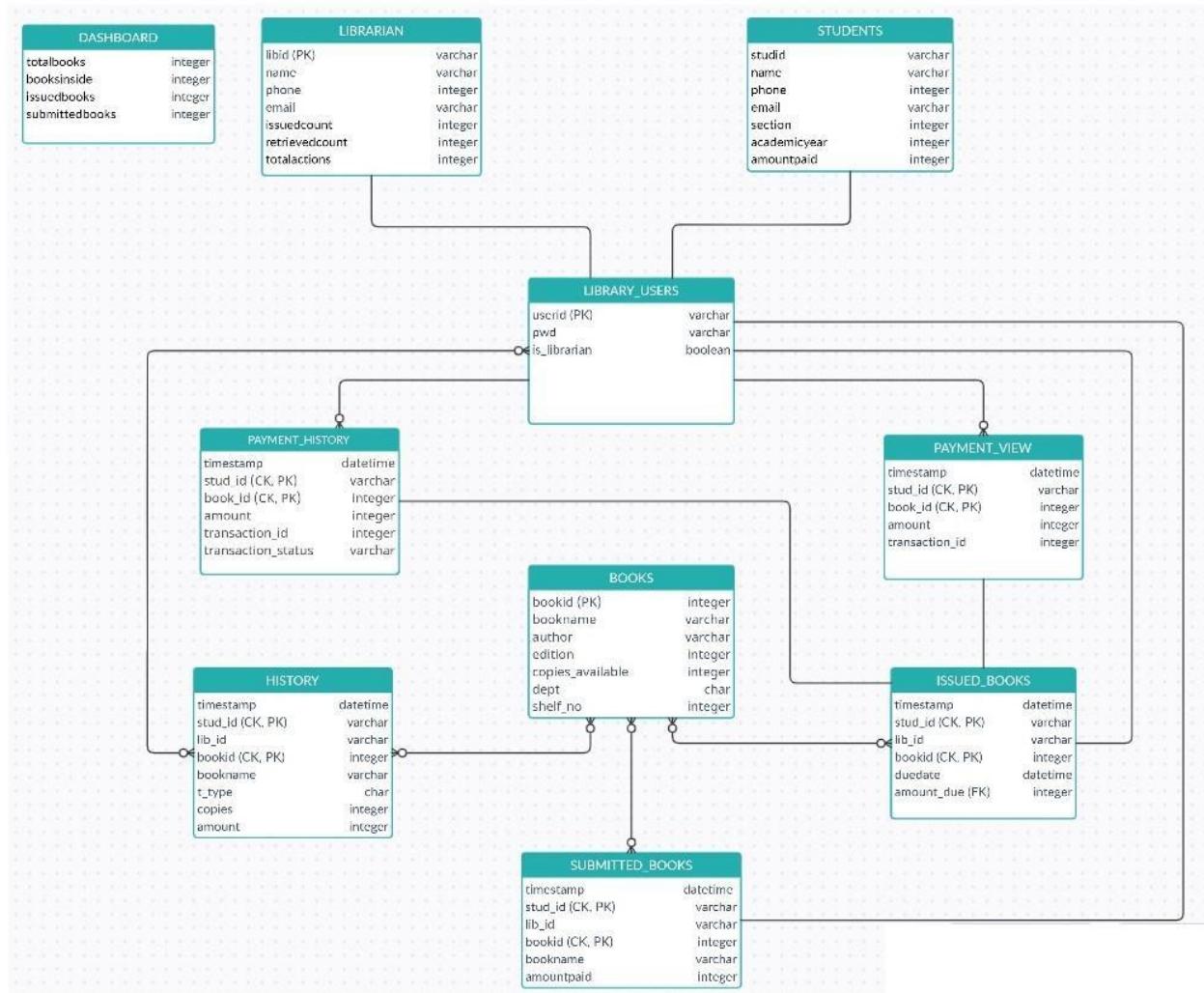
4.2.1 USE CASE DIAGRAM



4.2.2 CLASS DIAGRAM



4.3 DATABASE DIAGRAM



5. CODING TEMPLATE

5.1 VIEW FUNCTIONS

- **USERS APP:**
 - Login View, used to clear session cache (if any) and lands on the login page.
 - Validation View, used to validate the user input credentials received from the login page and validate them against the data stored in the database, and redirect to their homepage based on their category, i.e., Student or Librarian.
 - Forgot Password View, used to redirect to forgot password page where a form waits for an already registered user to input the user id and later changes to the form maintained to receive the OTP sent to the user registered mobile number.
 - Send OTP View, used to send the OTP to the registered mobile number.
 - Verify OTP View, used to verify the OTP entered at forgot password page and upon successful verification moves to set password page.
 - Resend OTP View, used to request for new OTP once again, enabled for every interval of 30 seconds.
 - Set Password View, used to display the page containing form to set the password and submit it reset the password in the backend.
 - Update Password View, is called through submit option from the form in the set password page and successfully updates password in the backend against the current user.

- View Profile View, used to redirect to the profile page with all their details from the backend database.
 - Search Result View, used to process the keyword received from the search bar and displays the results of the matching book information in the form of tables.
 - Logout View used to get the user land back on to the login page with a goodbye message.
- STUDENT APP:
 - Home Page View, used to display the student homepage with all the updated data relevant to the individual student.
 - Payment View, used to get the user's cart and payment page upon a single click from the pay button in the student home page.
 - Payment Successful View, used to update the payment information in payment view and payment history tables back in the database and redirect to the home page with respective "success" message.
 - Payment Failure View, used to update the payment information in the payment history table back in the database and redirects to the home page with a respective "failure" message.
- LIBRARIAN APP:
 - Home Page View, used to display the librarian homepage with all the updated data from the action history of issues and submits.
 - Student Profile View, used to display the student information in the librarian home page to review the student identity and perform action as per their request.

- Issue Book View, used to process the issue book form data and update the database accordingly and display the librarian homepage with accurate updated data.
- Submit Book View, used to process the submit book form data and update the database accordingly and display the librarian homepage with accurate updated data.
- Send Notifications View, used to send the notifications to the students via email regarding their tentative dates of submissions and remembrance of fines (if any).

5.2 JAVASCRIPT FUNCTIONS

- Callfun, is a function used to update the source of the image tag for the profile image displayed anywhere throughout the website in case of error on loading the image.
- UpdateSecs and Countdown Timer are coupled functions which work together to update the timer message in forgot password page and calls the fadeInButton function to emerge the resend button.
- FadeInButton, used to change the display style of the resend button and make it appear on to forgot password page later.

6. TESTING

Testing is the process of detecting errors. Testing performs a very crucial role for quality assurance and for ensuring the reliability of the software. The results of testing are used later on during maintenance also.

PURPOSE OF TESTING

The aim of the system testing process was to determine all defects in our project. The program was subjected to a set of test inputs and various observations were made and based on these observations it will be decided whether the program behaves as expected or not. Our Project went through two levels of testing

6.1 Unit testing

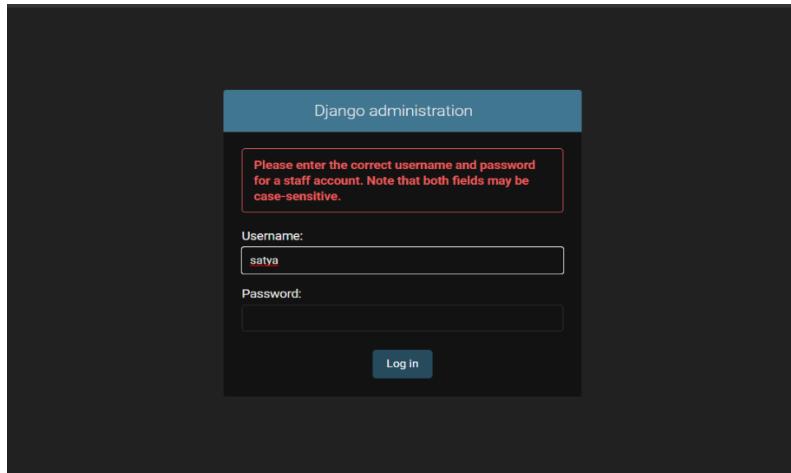
6.2 Integration testing

6.1 UNIT TESTING

Unit testing is undertaken when a module has been created and successfully reviewed. In order to test a single module we need to provide a complete environment i.e. besides the module we would require

1. Testing admin login form - This form is used for login of administrator of the system. In this we enter the username and password if both are correct administration page will open otherwise if any of data is wrong it will get redirected back to the login page and again ask for username and password.

The following picture shows, how the django administrative app responds to the unauthorized user attempts to login as admin.



2. Student account addition - In this section the admin can verify student details from student academic info and then only add student details to main library database it contains add and delete buttons if user click add button data will be added to student database and if he clicks delete button the student data will be deleted.

The following picture shows the list of students in the student's table. In clicking the add student's button, the admin can simply add the student.

The following picture shows the action of adding user data into their respective tables by the admin.

Django administration

WELCOME, SATYA. VIEW SITE / CHANGE PASSWORD / LOG OUT

Home > Student > Studentss > Add students

AUTHENTICATION AND AUTHORIZATION

- Groups [+ Add](#)
- Users [+ Add](#)

LIBRARIAN

- Dashboards [+ Add](#)
- Librarians [+ Add](#)

STUDENT

- Studentss [+ Add](#)

USERS

- Bookss [+ Add](#)
- Historys [+ Add](#)
- Issued_books [+ Add](#)
- Library_users [+ Add](#)
- Payment_histories [+ Add](#)
- Payment_views [+ Add](#)
- Submitted_books [+ Add](#)

Add students

Studid: [+ Add](#)

Name:

Phone:

Email:

Section:

Academic year:

Amount paid:

[Save and add another](#) [Save and continue editing](#) [SAVE](#)

3. Book Addition - Admin can enter details of book and can add the details to the main book table.

The following picture shows the list of books in the books table. In clicking the add books button, the admin can simply add the details of new book title.

Django administration

WELCOME, SATYA. VIEW SITE / CHANGE PASSWORD / LOG OUT

Home > Users > Bookss

AUTHENTICATION AND AUTHORIZATION

- Groups [+ Add](#)
- Users [+ Add](#)

LIBRARIAN

- Dashboards [+ Add](#)
- Librarians [+ Add](#)

STUDENT

- Studentss [+ Add](#)

USERS

- Bookss [+ Add](#)
- Historys [+ Add](#)
- Issued_books [+ Add](#)
- Library_users [+ Add](#)
- Payment_histories [+ Add](#)
- Payment_views [+ Add](#)
- Submitted_books [+ Add](#)

Select books to change

Action: Go 0 of 100 selected

<input type="checkbox"/> BOOKS
<input type="checkbox"/> 3005
<input type="checkbox"/> 3004
<input type="checkbox"/> 3003
<input type="checkbox"/> 3002
<input type="checkbox"/> 3001
<input type="checkbox"/> 6014
<input type="checkbox"/> 6006
<input type="checkbox"/> 6005
<input type="checkbox"/> 6004
<input type="checkbox"/> 6002
<input type="checkbox"/> 4009
<input type="checkbox"/> 4005
<input type="checkbox"/> 4004
<input type="checkbox"/> 1019
<input type="checkbox"/> 3006
<input type="checkbox"/> 7024

[ADD BOOKS +](#)

The following picture shows the action of adding new book data into books table by the admin.

Django administration

WELCOME, SATYA. VIEW SITE / CHANGE PASSWORD / LOG OUT

Home > Users > Books > Add books

AUTHENTICATION AND AUTHORIZATION	
Groups	+ Add
Users	+ Add
LIBRARIAN	
Dashboards	+ Add
Librarians	+ Add
STUDENT	
Studentss	+ Add

« **USERS**

Books	
Books	+ Add
History	+ Add
Issued_books	+ Add
Library_users	+ Add
Payment_histories	+ Add
Payment_views	+ Add
Submitted_books	+ Add

Add books

BookId:

Bookname:

Author:

Edition:

Copies:

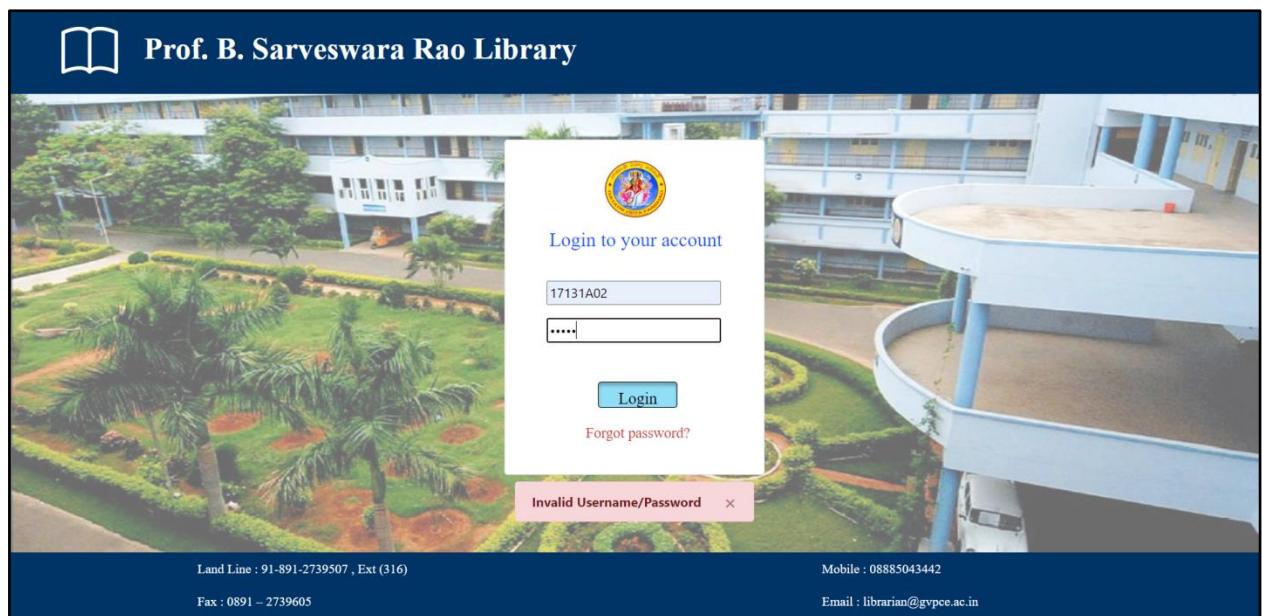
Shelf:

Dept:

[Save and add another](#) [Save and continue editing](#) **SAVE**

4. Test for Student login Form - This form is used for login of Student. In this we enter the library id, username and password if all these are correct student login page will open otherwise if any of data is wrong it will get redirected back to the login page and again ask for library id, username and password.

The following picture shows, how the system handles invalid credential errors when the unauthorized user attempts to login into the library system.



6.2 INTEGRATION TESTING

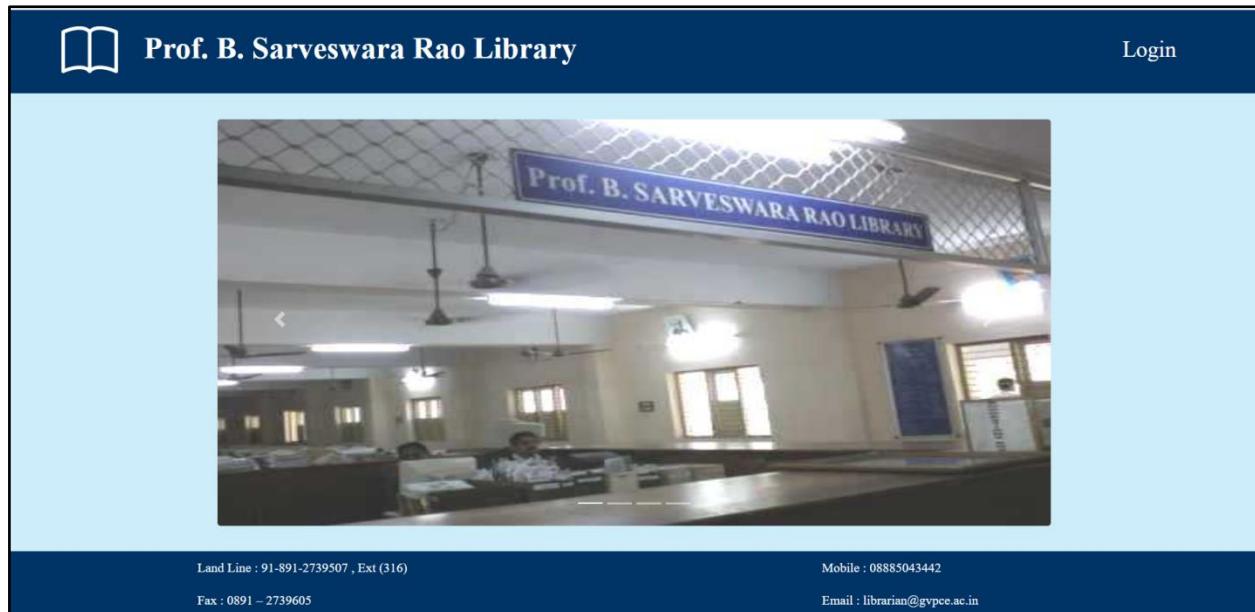
In this type of testing we test various integration of the project module by providing the input. The primary objective is to test the module interfaces in order to ensure that no errors are occurring when one module invokes the other module.

The context of this project, integration testing can't be explained under a single header. So, look into implementation and error handling section for more error cases in the system and how they are handled by the system itself.

7. IMPLEMENTATION & ERROR HANDLING

- Once you open up the browser and enter the following URL, the index page will be displayed.

URL - <http://127.0.0.1:8000/>

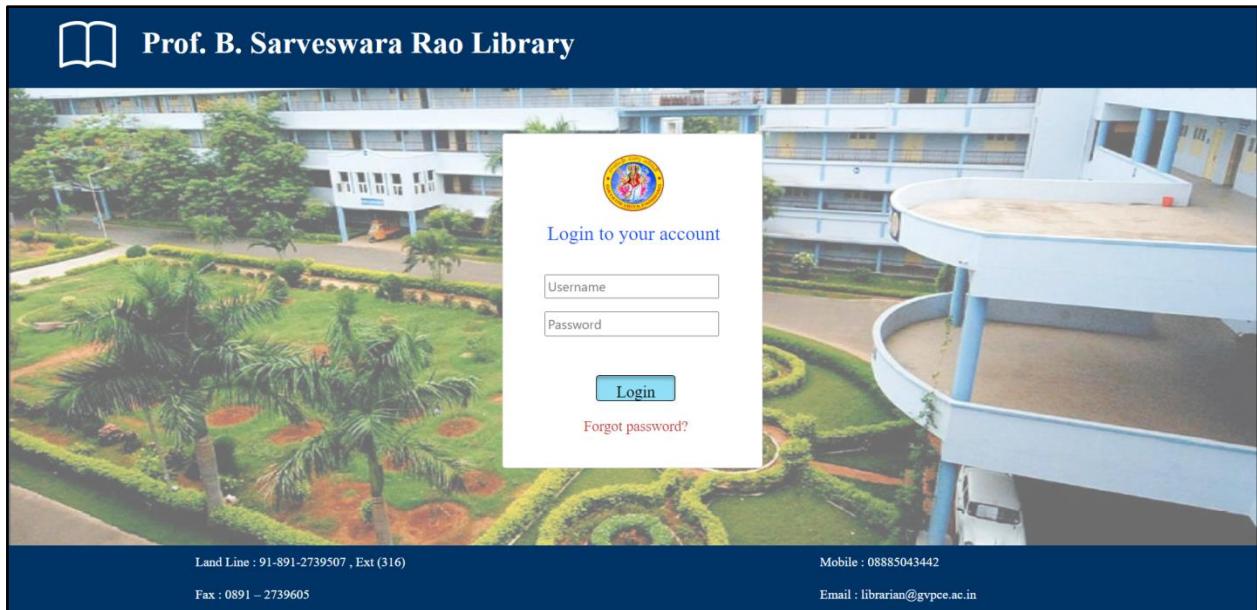


- After Scrolling down through the index page, you will find a table containing the library stats.

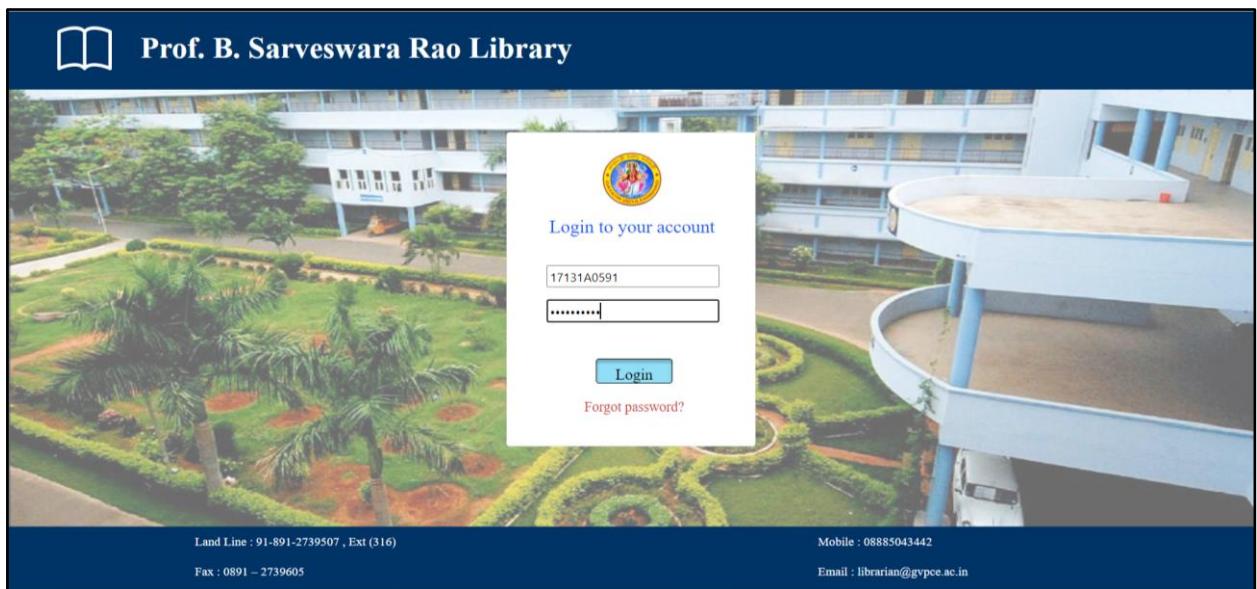
Library Collection			
S No	BRANCH	TITLES	VOLUMES
1	CHEMICAL ENGINEERING	1483	3463
2	CIVIL ENGINEERING	1878	8709
3	COMPUTER SCIENCE ENGINEERING	3028	11693
4	INFORMATION TECHNOLOGY	2041	6671
5	MECHANICAL ENGINEERING	2810	11101
6	ELECTRICAL & ELECTRONICS ENGINEERING	2204	7078
7	ELECTRONICS AND COMMUNICATIONS ENGINEERING	2724	12822

Land Line : 91-891-2739507 , Ext (316) Mobile : 08885043442
Fax : 0891 – 2739605 Email : librarian@gvpce.ac.in

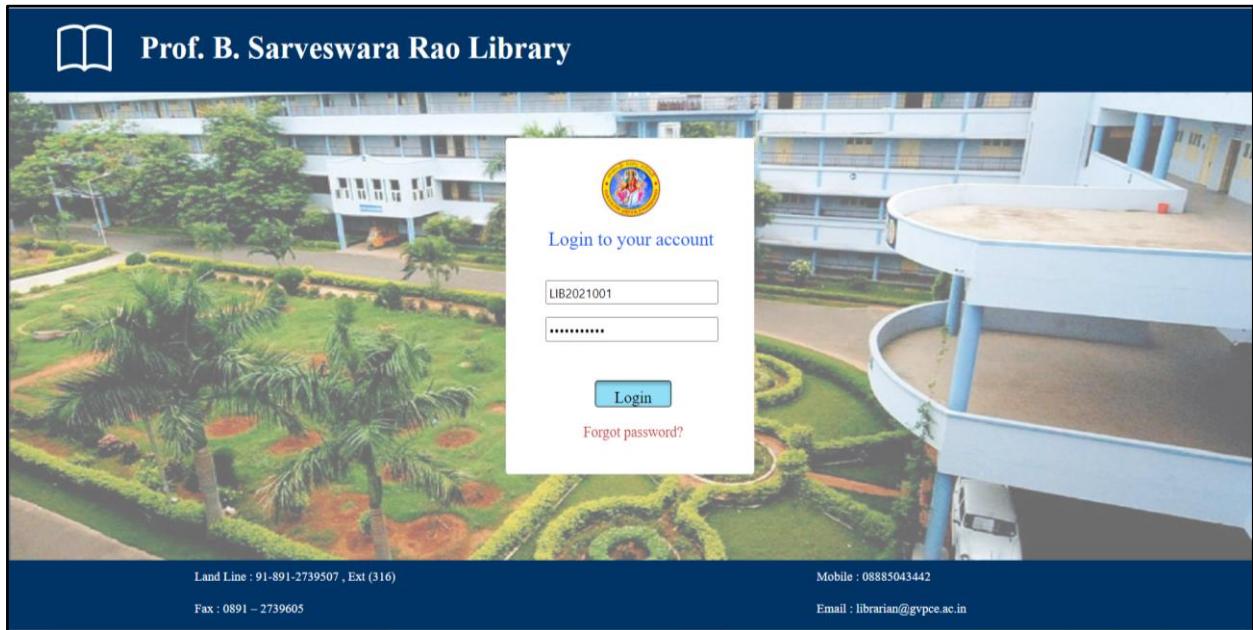
- On clicking the login button in the index page, you will be redirected to the login page.



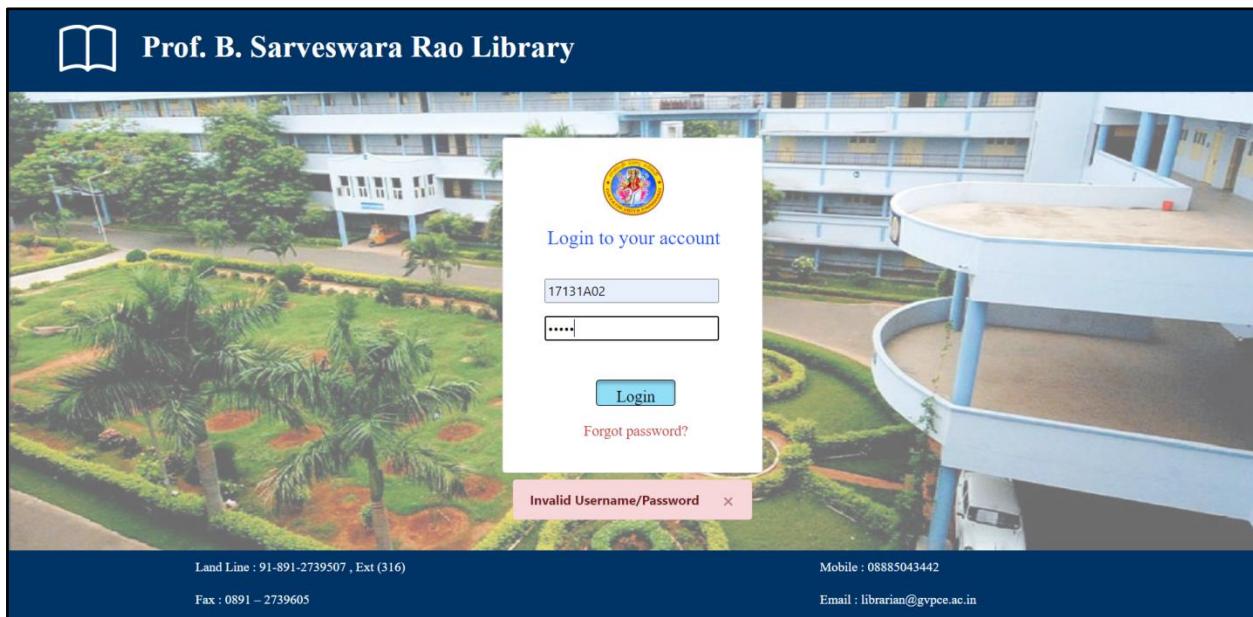
- The Login form waits for the user to enter the user credentials and get authorized. The following picture illustrates the student entering his/her credentials into the login form.



- This picture illustrates the action of librarian entering his/her login credentials into the login form.



- If the user enters the invalid username/password in the login form, upon validating he will be redirected to the login page with an error message stating “Invalid Username/Password”.



- Post successful validation, user will be redirected to their home page based on the kind of user they were. The following picture shows the librarian home page.

Prof. B. Sarveswara Rao Library

LIB2021001 Logout

Book Issue

Enter Roll No
Enter Book ID
Issue

Book Retrieval

Enter Roll No
Enter Book ID
Submit

Transactions

Time Stamp	Librarian ID	Student Roll no	Book ID	Book Name	Copies Available	Type
June 25, 2021, 7:51 p.m.	LIB2021002	17131A0591	2009	Renewable Energy Sources and Emerging Technologies	6	Submit
June 25, 2021, 7:05 p.m.	LIB2021002	17131A05B6	5002	Introduction to Computers	3	Issue

Dashboard

82939
Total Books

82937
Books Inside

7
Books Issued

5
Books Submitted

Land Line : 91-891-2739507 , Ext (316)
Mobile : 08885043442
Fax : 0891 – 2739605
Email : librarian@gvpce.ac.in

- Explaining the librarian home page.

Search Profile – When librarian wants to search the details of particular student, he can use the search profile bar.

Search Book – This search bar helps the user to find out the details of the book like number of copies available, branch it belongs to, edition and the shelf number.

Book Issue – Librarian can issue a book to students, by entering the student id and the book id in the Book issue form.

Book Retrieval – Librarian can retrieve a book from students, by entering the student id and the book id in the Book retrieval form.

Transactions – The recent 10 actions that have been performed are displayed.

Dashboard – It helps the librarian to keep an eye on the amount of books in the library.

- The picture below shows the student home page.

Book ID	Book Name	Book Issue Date	Due Date	Amount	Paynow
1007	Strength of Materials	June 25, 2021, 6:56 p.m.	June 25, 2021	15.0	<button>Paynow</button>

Time Stamp	Book ID	Book Name	Copies Available	Type	Amount
June 25, 2021, 7:51 p.m.	2009	Renewable Energy Sources and Emerging Technologies	6	Submit	21.00
June 25, 2021, 7:02 p.m.	5002	Introduction to Computers	3	Submit	0.00
June 25, 2021, 7:02 p.m.	5002	Introduction to Computers	4	Submit	0.00
June 25, 2021, 7:01 p.m.	5002	Introduction to Computers	2	Issue	0.00
June 25, 2021, 7 p.m.	2009	Renewable Energy Sources and Emerging Technologies	5	Issue	0.00

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Fax : 0891 – 2739605 Email : librarian@gvpce.ac.in

- Explaining the librarian home page.

Search Book – This search bar helps the user to find out the details of the book like number of copies available, branch it belongs to, edition and the shelf number.

Active Books – This is table consisting of all the active books had by the student. The number of active books can't be more than three.

Transactions – This table shows the list of past 10 transactions, i.e., taking or submitting the books including the time stamp and also the amount paid as fine per each book before submitting.

Actions of Librarian:

- Issuing books** – When a librarian is requested to issue a book by the student, the librarian verifies the student identity by searching their profile with the help of search profile bar and later enters the student ID and book ID in the Book issue form and issues it.

- The following picture shows the action of librarian searching for student profile through search profile bar. This shows the student profile which is showed in the later image below.

 Prof. B. Sarveswara Rao Library LIB2021001 Logout

<input type="text" value="17131A0591"/>	<input type="button" value="Search"/>	<input type="text" value="Search Book"/>	<input type="button" value="Search"/>																							
Book Issue		Book Retrieval		Dashboard																						
<input type="text"/> <input type="text"/> <input type="button" value="Issue"/>		<input type="text"/> <input type="text"/> <input type="button" value="Submit"/>		82939 Total Books 82934 Books Inside 10 Books Issued 5 Books Submitted																						
Transactions																										
<table border="1"> <thead> <tr> <th>Time Stamp</th> <th>Librarian ID</th> <th>Student Roll no</th> <th>Book ID</th> <th>Book Name</th> <th>Copies Available</th> <th>Type</th> </tr> </thead> <tbody> <tr> <td>June 30, 2021, 2:56 p.m.</td> <td>LIB2021001</td> <td>17131A0591</td> <td>4010</td> <td>Engineering Electromagnetics</td> <td>4</td> <td>Submit</td> </tr> <tr> <td>June 30, 2021, 2:50 p.m.</td> <td>LIB2021001</td> <td>17131A0591</td> <td>4010</td> <td>Engineering Electromagnetics</td> <td>3</td> <td>Issue</td> </tr> </tbody> </table>						Time Stamp	Librarian ID	Student Roll no	Book ID	Book Name	Copies Available	Type	June 30, 2021, 2:56 p.m.	LIB2021001	17131A0591	4010	Engineering Electromagnetics	4	Submit	June 30, 2021, 2:50 p.m.	LIB2021001	17131A0591	4010	Engineering Electromagnetics	3	Issue
Time Stamp	Librarian ID	Student Roll no	Book ID	Book Name	Copies Available	Type																				
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Land Line : 91-891-2739507 , Ext (316)			Mobile : 08885043442																							
Fax : 0891 – 2739605			Email : librarian@gvpce.ac.in																							

 Prof. B. Sarveswara Rao Library LIB2021001 Logout

<input type="text" value="17131A0591"/>	<input type="button" value="Search"/>	<input type="text" value="Search Book"/>	<input type="button" value="Search"/>													
Student Profile				Dashboard												
 Name : KARI VIJAYA Roll Number : 17131A0591 <table border="1"> <thead> <tr> <th>Book ID</th> <th>Issue Date</th> <th>Due Date</th> <th>Amount Due</th> </tr> </thead> <tbody> <tr> <td>5004</td> <td>June 30, 2021, 2:47 p.m.</td> <td>July 15, 2021</td> <td>0</td> </tr> <tr> <td>2007</td> <td>June 30, 2021, 2:50 p.m.</td> <td>June 29, 2021</td> <td>1.5</td> </tr> </tbody> </table>				Book ID	Issue Date	Due Date	Amount Due	5004	June 30, 2021, 2:47 p.m.	July 15, 2021	0	2007	June 30, 2021, 2:50 p.m.	June 29, 2021	1.5	82939 Total Books 82934 Books Inside 10 Books Issued 5 Books Submitted
Book ID	Issue Date	Due Date	Amount Due													
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Land Line : 91-891-2739507 , Ext (316)			Mobile : 08885043442													
Fax : 0891 – 2739605			Email : librarian@gvpce.ac.in													

- The following picture depicts the issuing book action in the librarian home page.

 Prof. B. Sarveswara Rao Library

LIB2021001 Logout

<input style="width: 100%; height: 25px; border: 1px solid #ccc; border-radius: 5px; margin-bottom: 5px;" type="text" value="Search Profile"/> 🔍	<input style="width: 100%; height: 25px; border: 1px solid #ccc; border-radius: 5px; margin-bottom: 5px;" type="text" value="Search Book"/> 🔍																						
Book Issue <div style="border: 1px solid #ccc; padding: 5px; width: fit-content; margin-bottom: 5px;"> <input type="text" value="17131A0591"/> <input type="text" value="7001"/> Issue </div>	Book Retrieval <div style="border: 1px solid #ccc; padding: 5px; width: fit-content; margin-bottom: 5px;"> <input type="text" value="Enter Roll No"/> <input type="text" value="Enter Book ID"/> Submit </div>	Dashboard <div style="border: 1px solid #ccc; padding: 10px; background-color: #e0f2fd;"> <p>82939 Total Books</p> <p>82934 Books Inside</p> <p>10 Books Issued</p> <p>5 Books Submitted</p> </div>																					
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- On successful issuing, the transaction is listed in the transactions table below as shown in the picture below.

 Prof. B. Sarveswara Rao Library

LIB2021001 Logout

<input style="width: 100%; height: 25px; border: 1px solid #ccc; border-radius: 5px; margin-bottom: 5px;" type="text" value="Search Profile"/> 🔍	<input style="width: 100%; height: 25px; border: 1px solid #ccc; border-radius: 5px; margin-bottom: 5px;" type="text" value="Search Book"/> 🔍																						
Book Issue <div style="border: 1px solid #ccc; padding: 5px; width: fit-content; margin-bottom: 5px;"> <input type="text" value="Enter Roll No"/> <input type="text" value="Enter Book ID"/> Issue </div>	Book Retrieval <div style="border: 1px solid #ccc; padding: 5px; width: fit-content; margin-bottom: 5px;"> <input type="text" value="Enter Roll No"/> <input type="text" value="Enter Book ID"/> Submit </div>	Dashboard <div style="border: 1px solid #ccc; padding: 10px; background-color: #e0f2fd;"> <p>82939 Total Books</p> <p>82933 Books Inside</p> <p>10 Books Issued</p> <p>4 Books Submitted</p> </div>																					
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<small>Land Line : 91-891-2739507 , Ext (316)</small> <small>Mobile : 08885043442</small> <small>Fax : 0891 – 2739605</small> <small>Email : librarian@gvpce.ac.in</small>																							

- If any errors while issuing, they are shown right above the transactions, as shown in the picture below.

 Prof. B. Sarveswara Rao Library

LIB2021001 Logout

Search Profile Search Book

Book Issue

17131A0591
5004
Issue

Book Retrieval

Enter Roll No
Enter Book ID
Submit

Dashboard

82939 Total Books
82935 Books Inside
8 Books Issued
4 Books Submitted

Transactions

Time Stamp	Librarian ID	Student Roll no	Book ID	Book Name	Copies Available	Type
June 30, 2021, 2:47 p.m.	LIB2021001	17131A0591	5004	Fundamentals of Computers	4	Issue

Land Line : 91-891-2739507 , Ext (316) Mobile : 08885043442
Fax : 0891 – 2739605 Email : librarian@gvpce.ac.in

- The above picture shows the error, which occurs when the student tries to take the same book again which he/she already possessed.

 Prof. B. Sarveswara Rao Library

LIB2021001 Logout

Search Profile Search Book

Book Issue

17131A0591
3003
Issue

Book Retrieval

Enter Roll No
Enter Book ID
Submit

Dashboard

82939 Total Books
82933 Books Inside
10 Books Issued
4 Books Submitted

Transactions

Time Stamp	Librarian ID	Student Roll no	Book ID	Book Name	Copies Available	Type
June 30, 2021, 2:50 p.m.	LIB2021001	17131A0591	4010	Engineering Electromagnetics	3	Issue

Land Line : 91-891-2739507 , Ext (316) Mobile : 08885043442
Fax : 0891 – 2739605 Email : librarian@gvpce.ac.in

- The above picture shows the error, which occurs when the student tries to take the Books than the permitted count.

- **Retrieving books** – When a librarian is requested to retrieve a book by the student, the librarian verifies the student identity by searching their profile with the help of search profile bar and later enters the student ID and book ID in the Book retrieve form and submits it.
- The entire process is similar to issuing book in terms of verifying student profile and filling up the form, but this time the librarian uses the book retrieval form.
- The following picture depicts the retrieving book action in the librarian home page.

The screenshot shows the homepage of the Prof. B. Sarveswara Rao Library. At the top, there is a navigation bar with a logo, the library name, user ID (LIB2021001), and a Logout link. Below the navigation bar, there are two search bars: "Search Profile" and "Search Book". The main content area is divided into three sections: "Book Issue", "Book Retrieval", and "Dashboard". The "Book Retrieval" section contains fields for "Enter Roll No" (17131A0591) and "Enter Book ID" (7001), with a "Submit" button. The "Transactions" table below shows two entries. The "Dashboard" section displays statistics: 82939 Total Books, 82934 Books Inside, 10 Books Issued, and 5 Books Submitted. The footer provides contact information: Land Line : 91-891-2739507 , Ext (316), Mobile : 08885043442, Fax : 0891 - 2739605, Email : librarian@gvpce.ac.in.

Time Stamp	Librarian ID	Student Roll no	Book ID	Book Name	Copies Available	Type
June 30, 2021, 2:56 p.m.	LIB2021001	17131A0591	4010	Engineering Electromagnetics	4	Submit
June 30, 2021, 2:50 p.m.	LIB2021001	17131A0591	4010	Engineering Electromagnetics	3	Issue

- On successful retrieving, the transaction is listed in the transactions table below as shown in the picture below.

The screenshot shows the library's main interface. At the top, there is a navigation bar with a book icon, the library name "Prof. B. Sarveswara Rao Library", and user information "LIB2021001" and "Logout". Below the navigation bar are two search boxes: "Search Profile" and "Search Book", each with a magnifying glass icon.

Book Issue: Contains fields for "Enter Roll No" and "Enter Book ID", followed by a blue "Issue" button.

Book Retrieval: Contains fields for "Enter Roll No" and "Enter Book ID", followed by a blue "Submit" button.

Transactions: A table showing library activity. The first row (highlighted with an orange border) is for a book issue on July 2, 2021, at 9:43 p.m. The second row is for a book retrieval on June 29, 2021, at 8:44 p.m.

Time Stamp	Librarian ID	Student Roll no	Book ID	Book Name	Copies Available	Type
July 2, 2021, 9:43 p.m.	LIB2021001	17131A0591	7001	Physical Chemistry	4	Submit
June 29, 2021, 8:44	LIB2021001	17131A0591	7001	Physical Chemistry	3	Issue

Dashboard: Shows statistics: Total Books (82939), Books Inside (82934), Books Issued (10), and Books Submitted (5).

Bottom footer: Land Line : 91-891-2739507 , Ext (316), Mobile : 08885043442, Fax : 0891 – 2739605, Email : librarian@gvpce.ac.in

- If any errors while issuing, they are shown right above the transactions, as shown in the picture below.

This screenshot is similar to the one above but shows an error message. In the "Book Retrieval" section, the "Enter Book ID" field contains "6001" and the "Submit" button is highlighted in blue. A red error message box appears above the transactions table, stating "Book is not taken by this User" with a close button.

Transactions: The table shows a single entry for a book retrieval on June 30, 2021, at 2:50 p.m.

Time Stamp	Librarian ID	Student Roll no	Book ID	Book Name	Copies Available	Type
June 30, 2021, 2:50 p.m.	LIB2021001	17131A0591	4010	Engineering Electromagnetics	3	Issue

Dashboard: Shows statistics: Total Books (82939), Books Inside (82933), Books Issued (10), and Books Submitted (4).

Bottom footer: Land Line : 91-891-2739507 , Ext (316), Mobile : 08885043442, Fax : 0891 – 2739605, Email : librarian@gvpce.ac.in

- The above picture shows the error, when the student tries to submit any book other than the one, he lent from the library.

The screenshot shows the library's homepage with three main sections: Book Issue, Book Retrieval, and Dashboard. The Book Issue section contains fields for Roll No and Book ID, with a blue 'Issue' button. The Book Retrieval section shows a book with ID 17131A0591 and ID 2007, with a blue 'Submit' button. A pink warning box in the center states 'Book has 1.5 Rs. of fine to pay!' with an 'X'. The Dashboard on the right displays statistics: 82939 Total Books, 82933 Books Inside, 10 Books Issued, and 4 Books Submitted. The footer provides contact information: Land Line: 91-891-2739507, Ext (316); Mobile: 08885043442; Fax: 0891 - 2739605; Email: librarian@gvpce.ac.in.

- The above picture shows the error, when the student tries to submit the book that has some due amount in terms of fine, without paying it.

- Viewing Personal Profile** – On the librarian home page, there is link to view his profile page through the identification number displayed in the header. On clicking it, the librarian to their profile, which will look like this in the picture below.

The screenshot shows the librarian's profile page titled 'PROFILE'. It features a placeholder for a profile picture and a table with the following data:

Name	K RAVI
User ID	LIB2021001
Email ID	lib2021001@gvpce.ac.in
Number Of Books Issued	10
Number Of Books Retrieved	5
Total number of Actions	15

At the bottom, there are two buttons: 'Return to home page' and 'Send Mail Notifications'. The footer provides contact information: Land Line: 91-891-2739507, Ext (316); Mobile: 08885043442; Fax: 0891 - 2739605; Email: librarian@gvpce.ac.in.

Actions of Student:

- **Paying Fines** – If the student is subjected to any fine for any book, then whenever the student is willing to pay, they will reach out to the payment action through the paynow button which appears for every individual book row in the Active Books table.

The screenshot shows a library management system interface. At the top, there is a header with a logo, the library name "Prof. B. Sarveswara Rao Library", a user ID "17131A0591", and a "Logout" link. Below the header is a search bar labeled "Search Book" with a magnifying glass icon. The main content area is divided into two sections: "Active Books" and "Transactions".

Active Books

Book ID	Book Name	Book Issue Date	Due Date	Amount	Paynow
7001	Physical Chemistry	July 8, 2021, 12:56 p.m.	July 23, 2021	0	<button>Paynow</button>
2007	Elements of Engineering Electromagnetic	June 23, 2021, 4:30 p.m.	July 8, 2021	1.5	<button>Paynow</button>

Transactions

Time Stamp	Book ID	Book Name	Copies Available	Type	Amount
July 9, 2021, 4:30 p.m.	2007	Elements of Engineering Electromagnetic	3	Issue	0.00
July 8, 2021, 1:07 p.m.	7010	Electronic Devices and Circuits	4	Submit	16.50
July 8, 2021, 1:01 p.m.	5002	Introduction to Computers	4	Submit	0.00
July 8, 2021, 12:57 p.m.	5002	Introduction to Computers	3	Issue	0.00

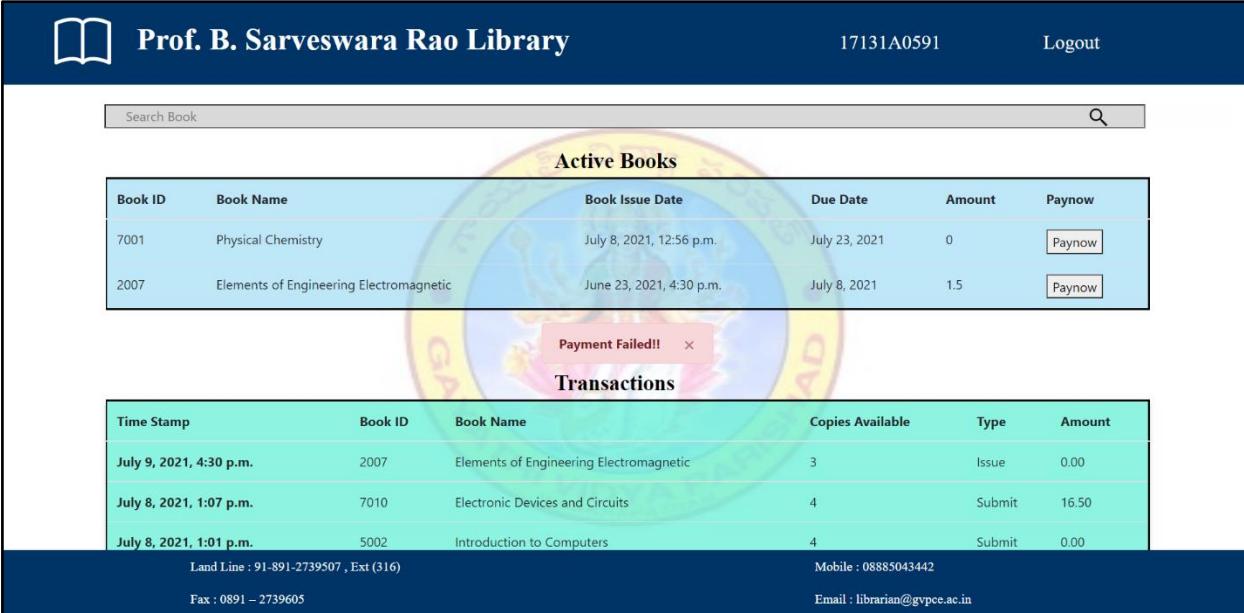
At the bottom of the page, there are contact details: Land Line : 91-891-2739507 , Ext (316), Fax : 0891 – 2739605, Mobile : 08885043442, Email : librarian@gvpce.ac.in

- The following picture illustrates the payment action in case of paying fines for books.

The screenshot shows a payment confirmation page. The title at the top is "Welcome 17131A0591, Your Cart Payment Details". Below the title is a table titled "Your Cart Details" containing the following information:

Your Cart Details	
User ID	17131A0591
Book ID	2007
Amount	1.50
<button>Success</button>	<button>Failure</button>

- On clicking success, the payment action is considered as a success and on clicking failure, the payment action is considered as a failure. In either of the cases, the user is redirected to their homepage with the payment status message.
- The following picture, illustrates the payment failure action by the student. In case of failure payment, no data is updated in the backend.



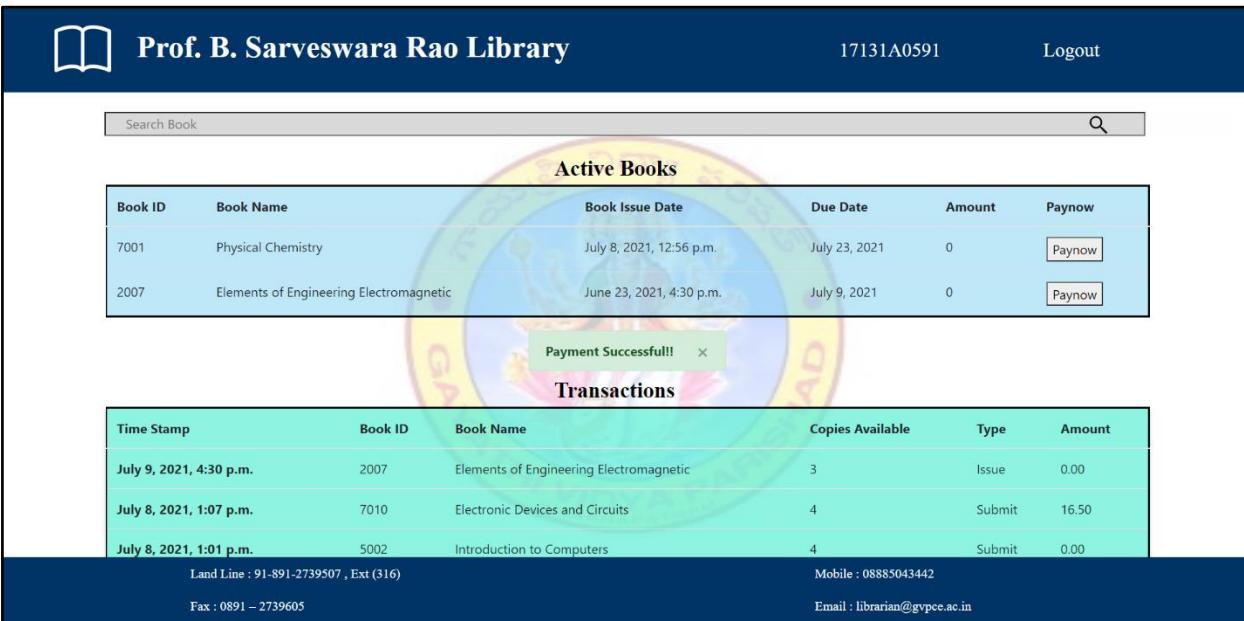
Active Books

Book ID	Book Name	Book Issue Date	Due Date	Amount	Paynow
7001	Physical Chemistry	July 8, 2021, 12:56 p.m.	July 23, 2021	0	<button>Paynow</button>
2007	Elements of Engineering Electromagnetic	June 23, 2021, 4:30 p.m.	July 8, 2021	1.5	<button>Paynow</button>

Transactions

Time Stamp	Book ID	Book Name	Copies Available	Type	Amount
July 9, 2021, 4:30 p.m.	2007	Elements of Engineering Electromagnetic	3	Issue	0.00
July 8, 2021, 1:07 p.m.	7010	Electronic Devices and Circuits	4	Submit	16.50
July 8, 2021, 1:01 p.m.	5002	Introduction to Computers	4	Submit	0.00

Land Line : 91-891-2739507 , Ext (316) Mobile : 08885043442
Fax : 0891 – 2739605 Email : librarian@gvpce.ac.in



Active Books

Book ID	Book Name	Book Issue Date	Due Date	Amount	Paynow
7001	Physical Chemistry	July 8, 2021, 12:56 p.m.	July 23, 2021	0	<button>Paynow</button>
2007	Elements of Engineering Electromagnetic	June 23, 2021, 4:30 p.m.	July 9, 2021	0	<button>Paynow</button>

Transactions

Time Stamp	Book ID	Book Name	Copies Available	Type	Amount
July 9, 2021, 4:30 p.m.	2007	Elements of Engineering Electromagnetic	3	Issue	0.00
July 8, 2021, 1:07 p.m.	7010	Electronic Devices and Circuits	4	Submit	16.50
July 8, 2021, 1:01 p.m.	5002	Introduction to Computers	4	Submit	0.00

Land Line : 91-891-2739507 , Ext (316) Mobile : 08885043442
Fax : 0891 – 2739605 Email : librarian@gvpce.ac.in

- The above picture, illustrates the payment success action by the student against the particular book. You can observe, on successful transaction the book information is slightly changed, i.e., the amount due is changed to Rs. 0 and the due date is changed to the current date.
- If the payment fine is greater than Rs. 0, only then the student is redirected to the payments page. Otherwise, the student will be restrained in the home page itself.
- **Viewing Personal Profile** – If the student wishes to visit his personal profile page, then the student can simply click on their identification number on their homepage. Then they will be redirected to the student profile page. The student profile page is shown below for reference.

📖 Prof. B. Sarveswara Rao Library
 17131A0591
Logout

PROFILE



Name	KARI VIJAYA
Roll Number	17131A0591
Email ID	17131a0591@gvpce.ac.in
Phone Number	7013537287
Academic Year	2017-2021
Section	2
Amount Paid till now 1.50	

[Return to home page](#)

Land Line : 91-891-2739507 , Ext (316)
Mobile : 08885043442

Fax : 0891 – 2739605
Email : librarian@gvpce.ac.in

Common Actions for Both Librarian and Student:

- **Search Books** – For any user, there is search bar for books in their home pages. This search book bar allows any user to search books through their names by giving any matching part of it as search keyword.
- The following picture shows the action of searching the books by a librarian, and the later shows the same action by the student.

The screenshot shows the homepage of the library system. At the top, there is a search bar with the placeholder "Search Profile" and a search icon. To its right is another search bar with the text "MATH ALGO" and a search icon. Below these are three main sections: "Book Issue" (with fields for Roll No and Book ID, and a blue "Issue" button), "Book Retrieval" (with fields for Roll No and Book ID, and a blue "Submit" button), and "Dashboard". The Dashboard section displays statistics: 82939 Total Books, 82934 Books Inside, 10 Books Issued, and 5 Books Submitted. At the bottom, contact information is provided: Land Line : 91-891-2739507 , Ext (316), Mobile : 08885043442, Fax : 0891 – 2739605, Email : librarian@gvpce.ac.in.

This screenshot shows the library homepage from the perspective of a student. The search bar at the top contains the text "math algo". Below the search bar are two sections: "Active Books" and "Transactions". The "Active Books" section lists two books: "Fundamentals of Computers" (Book ID 5004) and "Elements of Engineering Electromagnetic" (Book ID 2007). The "Transactions" section lists four entries: a submission of "Engineering Electromagnetics" (Book ID 4010) on June 30, 2021, 2:47 p.m.; an issue of "Engineering Electromagnetics" (Book ID 4010) on June 30, 2021, 2:50 p.m.; an issue of "Elements of Engineering Electromagnetic" (Book ID 2007) on June 30, 2021, 2:50 p.m.; and an issue of "Fundamentals of Computers" (Book ID 5004) on June 30, 2021, 2:47 p.m. At the bottom, contact information is provided: Land Line : 91-891-2739507 , Ext (316), Mobile : 08885043442, Fax : 0891 – 2739605, Email : librarian@gvpce.ac.in.

- The following image shows the results of query search in the search results page, as per the keywords given for query search by the user.

Search Book

Book ID	Book Name	Author Name	Edition	Copies Available	Shelf	Dept
5006	Discrete Mathematical Structures with Applications to Computer Science	J.P Tremblay	0	7	11	CSE
5008	Discrete Mathematics for Computer Science	Kenneth Bogart	1	9	11	CSE
5009	Introduction to Design and Analysis of Algorithms A strategic approach	R.C.T.Lee	2	2	11	CSE
5010	Data structures and Algorithm Analysis in C++	Allen Weiss	2	3	11	CSE

[Return to home page](#)

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Fax : 0891 – 2739605 Email : librarian@gvpce.ac.in

- The search result page is also provided with the same functionality to search books through the search bar and get back results in the same page. The following image shows the above stated action.

COMPUTER SCIENCE

Book ID	Book Name	Author Name	Edition	Copies Available	Shelf	Dept
5001	Fundamentals of Computers	Reema Thareja	1	1	11	CSE
5002	Introduction to Computers	Peter Norton	7	3	11	CSE
5004	Fundamentals of Computers	E.Balagurusamy	1	4	11	CSE
5005	Fundamentals of computers	V. Raja Raman	6	6	11	CSE
5006	Discrete Mathematical Structures with Applications to Computer Science	J.P Tremblay	0	7	11	CSE
5008	Discrete Mathematics for Computer Science	Kenneth Bogart	1	9	11	CSE
6016	Digital Signal Processing ? A Computer Based Approach	Sanjit K. Mitra	4	5	13	IT

[Return to home page](#)

Land Line : 91-891-2739507 , Ext (316) Mobile : 08885043442
Fax : 0891 – 2739605 Email : librarian@gvpce.ac.in

- Incase of no matchable keywords, it results in displaying a message in the search result page stating “No matching books found to your query”. The following two images describes the action stated above.
- The following picture shows the action done by the Librarian and later by the student in their respective homepages.

Prof. B. Sarveswara Rao Library

LIB2021001 Logout

Book Issue

Enter Roll No
Enter Book ID
Issue

Book Retrieval

Enter Roll No
Enter Book ID
Submit

Dashboard

82939
Total Books

82934
Books Inside

10
Books Issued

5
Books Submitted

Transactions

Time Stamp	Librarian ID	Student Roll no	Book ID	Book Name	Copies Available	Type
June 30, 2021, 2:56 p.m.	LIB2021001	17131A0591	4010	Engineering Electromagnetics	4	Submit
June 30, 2021, 2:50 p.m.	LIB2021001	17131A0591	4010	Engineering Electromagnetics	3	Issue

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Prof. B. Sarveswara Rao Library

17131A0591 Logout

Active Books

Book ID	Book Name	Book Issue Date	Due Date	Amount	Paynow
5004	Fundamentals of Computers	June 30, 2021, 2:47 p.m.	July 15, 2021	0	Paynow
2007	Elements of Engineering Electromagnetic	June 30, 2021, 2:50 p.m.	June 30, 2021	13.5	Paynow

Transactions

Time Stamp	Book ID	Book Name	Copies Available	Type	Amount
June 30, 2021, 2:56 p.m.	4010	Engineering Electromagnetics	4	Submit	0.00
June 30, 2021, 2:50 p.m.	4010	Engineering Electromagnetics	3	Issue	0.00
June 30, 2021, 2:50 p.m.	2007	Elements of Engineering Electromagnetic	3	Issue	0.00
June 30, 2021, 2:47 p.m.	5004	Fundamentals of Computers	4	Issue	0.00

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- The following image is the result of unmatched keywords given by the user in the search result page.



Search Book

Sorry, No books found for your query search. X[Return to home page](#)

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- **Logging out from their Accounts** – If the user (librarian/student) wishes no longer to stay logged in, then simply by clicking the logout button in the top right corner of the header. After they logged out successfully, they will be redirected to the login page with good bye message stating “You have been logged out successfully”.



Login to your account

 Username Password[Login](#)[Forgot password?](#)You have been logged out successfully!! X

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- **Resetting Password** – This action is also common feature for any user which allows them to reset their password for their accounts via simple

OTP authentication. When the user clicks on the forgot password link in the login page, they will be redirected to forgot password page. There in the forgot password page, a form waits for the user to enter their identification number in the text box, to get the OTP or One Time Password.

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- Incase of invalid User ID, the user is restrained in the forgot password page itself with an error message stating “Invalid User ID”.

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- On successful verification of User ID, the user will receive an OTP on their registered mobile number and the page is updated to the following state.

Prof. B. Sarveswara Rao Library

Login

Enter OTP and Verify

Enter OTP

Verify OTP

Resend OTP option appears in 28s.

OTP sent successfully on your registered mobile number. ×

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- The forgot password page is updated to take input the OTP from the user and also to request OTP again through resend OTP button which appears after an interval of 30 seconds. The following image shows the state of the page with resend OTP button and verify OTP button.

Prof. B. Sarveswara Rao Library

Login

Enter OTP and Verify

879910

Verify OTP

Resend OTP

OTP sent successfully on your registered mobile number. ×

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- For some reason, if the user wishes for a new OTP through resend OTP button, the user is sent with another OTP and the page updates to the following state.

The screenshot shows a web page titled "Prof. B. Sarveswara Rao Library". At the top right is a "Login" link. Below the title is a form titled "Enter OTP and Verify" containing an input field labeled "Enter OTP" and a blue "Verify OTP" button. Below the button, text says "Resend OTP option appears in 27s.". A green success message at the bottom states "OTP re-sent successfully on your registered mobile number!!" with a close button. At the bottom of the page, contact information is listed: Land Line : 91-891-2739507 , Ext (316), Fax : 0891 – 2739605, Mobile : 08885043442, Email : librarian@gvpce.ac.in.

- On entering the OTP, and clicking the verify OTP button, the user entered OTP is verified. If the user entered OTP is incorrect, then the page updates to show an error message as shown in the picture below.

The screenshot shows a web page titled "Prof. B. Sarveswara Rao Library". At the top right is a "Login" link. Below the title is a form titled "Enter OTP and Verify" containing an input field labeled "Enter OTP" and a blue "Verify OTP" button. Below the button, text says "Resend OTP option appears in 24s.". A red error message at the bottom states "Invalid OTP!" with a close button. At the bottom of the page, contact information is listed: Land Line : 91-891-2739507 , Ext (316), Fax : 0891 – 2739605, Mobile : 08885043442, Email : librarian@gvpce.ac.in.

- On successful validation the user is redirected to the set password page which contains a form to enter password and re-enter password for security reasons.

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- In case of mismatch between the new password and re-entered password, the user is restrained in the set password page itself with an error message as shown below.

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On successful action, i.e., when both the new password and re-entered password is matched, the user will be redirected to their homepage.

7. CONCLUSION & FUTURE SCOPE

This website provides a computerized version of the library management system which will benefit the students as well as the staff of the library. As the process is entirely online, a lot of paper work will be reduced, manual errors will be reduced significantly, time taken for each and every action performed by both student and librarian will be greatly reduced. Thus, it helps in revolutionizing the old practice of card system in the libraries.

In future, many more features such as online lectures video tutorials can be added by teachers as well as online assignments submission facility, a feature of group chat where students can discuss various issues of engineering can be added to this project thus making it more interactive, more user friendly and this project fulfills every user need in the best way possible.

8. REFERENCES

- Django documentation

<https://docs.djangoproject.com/en/3.2/>

- Git commands

<https://dzone.com/articles/top-20-git-commands-with-examples>

- Django cs50 Tutorial

<https://youtu.be/ZjAMRnCu-84>

- Bootstrap documentation

<https://getbootstrap.com/>

- Stack overflow

<https://stackoverflow.com/>

- Two factor authentication

[Nikhilshirsath private blog on 2FA](#)

- w3 Schools

<https://www.w3schools.com/css/>

- freeCodeCamp

[Complete django tutorial](#)