

LIBRARY MANAGEMENT SYSTEM



A CourseProject Report

In partial fulfillment ofthe subject

Object-Oriented Programming through Java

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Submitted to



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**DEPARTMENT OF ELECTRONICS &
COMMUNICATION ENGINEERING**

S.R.ENGINEERING COLLEGE (A), ANANTHASAGAR, WARANGAL

(Affiliated to JNTUH, Accredited by NBA)

May, 2022.



DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

CERTIFICATE

This is to certify that the Minor Project Report entitled “ **LIBRARY MANAGEMENT SYSTEM**” is a record of bonafide work carried out by the student(s) **BANDARI SURAKSHITH , SHALVA DURGA PRASAD** bearing Roll No(s) **19K41A0407 , 19K41A0424** during the academic year 2019-20 in partial fulfillment of the award of the degree of *Bachelor of Technology* in *ELECTRONICS & COMMUNICATION ENGINEERING* by the Jawaharlal Nehru Technological University, Hyderabad.

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ACKNOWLEDGEMENT

We owe an enormous debt of gratitude to our project guide **Dr. K. RAVI CHYTANYA** for guiding us from the beginning through the end of the Capstone project with his intellectual advices and insightful suggestions. We truly value his consistent feedback on our progress, which was always constructive, encouraging and ultimately drove us to the right direction.

We express our thanks to **Dr. K. RAVI CHYTANYA** for his encouragement and support.

We wish to take this opportunity to express our sincere gratitude and deep sense of respect to our beloved Principal, **Dr. V. Mahesh**, for his continuous support and guidance to complete this project in the institute.

Finally, we express our thanks to all the teaching and non-teaching staff of the department for their suggestions and timely support.

ABSTRACT

With the advancement of technology, it is imperative to exalt all the systems into a user-friendly manner. The Library Management system (LMS) acts as a tool to transform traditional libraries into digital libraries. In traditional libraries, the students/user has to search for books which are hassle process and there is no proper maintenance of database about issues/fines. The overall progress of work is slow and it is impossible to generate a fast report. The librarians have to work allotted for arranging, sorting books in the book sells. At the same time, they have to check and monitor the lend/borrow book details with its fine. It is a tedious process to work simultaneously in different sectors. LMS will assist the librarians to work easily. The LMS supports the librarians to encounter all the issues concurrently. The users need not stand in a queue for a long period to return/borrow a book from the library. The single PC contains all the data's in it. The librarians have to assess the system and provide an entry in it. Through LMS the librarian can find the book in the bookshelves. The LMS is designed with the basic features such as librarian can add/view/update/delete books and students' details in it. Student can login to see availability of books and he can change the password and can check the dead line of borrowed book. The library management system is a window based application which is developed using Eclipse and the whole code is written using java. Thus our system contributes its new approach towards the digital library setup.

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CHAPTER 1

INTRODUCTION

A library is a place where a huge collection of books and resources are available which can be accessible by the users. It acts as a brain for the institutions. It enhances the dissemination of knowledge and spiritual civilization among the students. The tons of books and research works are captivating the students to improvise their knowledge in all perspectives. It guides the students to promote their views differently. This knowledge optimizes the student to achieve a better result in academic as well as personal skill development. Improvisation in technology causes the demand for developing a way to enhance the traditional library set up to digital one. Numerous tedious processes reduce the efficiency of the library. For example, it always needs manual support to do any activities in the traditional library. The count and details of books are scribbled in the paper for reference. Each data is fetched in the notebook for future citations. To examine any data then they have to refer the notebooks. At the same time while distributing the books to the students they have to enter into the notebook where they need to represent the book id, distribution and renewal date, and student id. The librarians/staff have to assign a tag for each book and provide an id for it. They have to align and arrange the books on the shelves and marked it. Missing or theft of the book builds a serious issue and confusion to the librarians. While collecting the book from the students they have to verify the penalties of the books. Therefore it causes a monotonous among the staff. Consequently, it builds an uninteresting among the student due to the slow progress of the staff. To evoke the library into the technological era, we presented a system called the Library Management system (LMS). It is an automatic system that reduces the work burden of the staff/librarians through a single click. It will manage, organize and oriented the library task.

The LMS supports the librarian to add/view/delete/update details from the library stock. Here we integrate all the library data into Text files using I/O streams. Preliminarily the librarian has to add student and book details into the database. After that he/she can view/delete/update those details through the Library Management system. On account of this, the user can access the library at any time. The librarians can assist the data without any confusion. If he/she accesses any user details then it shows username, id, book details, and penalty details. They no need to write it on paper for any references. The librarian can feel easy to handle the automatic system. It has more additional features such as librarian can maintain library records, student's history of penalties and issues. It always tracks the count of the book in the library and issued book details. This causes a flexible service for librarians and students. It is a user-friendly interface, so basic computer knowledge is enough to access the LMS. The system is a customizable and user-configurable one which

causes it to use in different organizations. We represent the LMS with Admin module. We built the LMS using Eclipse and the whole code is written in java.

This project provides an overview about the aim and objectives of the proposed system

1.1PROJECT AIMS AND OBJECTIVES

The project aims and objectives that will be achieved after completion of this project are discussed in this subchapter. The aims and objectives are as follows.

- Admin/librarian login page.
- Admin/librarian can add new member, new books and updating information.
- Admin/librarian can search books and issue books.
- Student login page where student can find books issued by him/her and date of return.
- A search column to search availability of books.
- List will be automatically updated.

1.2EXISTING SYSTEM VS PROPOSED SYSTEM

- Existing system has login for admin but the proposed system will have librarian's login as well as student login.
- Existing system doesn't have facility to see students issued books date of return whereas the proposed system provides where student can find books issued by him/her and date of return.
- Existing system doesn't have search column to see availability of books whereas the proposed system provides a search column to search availability of books.
- Existing system doesn't automatically generates defaulters list whereas the proposed system provides defaulters list automatically.
- Existing system has more paperwork whereas proposed system doesn't requires paperwork.

CHAPTER 2

LITERATURE SURVEY

Most of the research and writings on library management have focused on academic libraries and only recently has there been more interest in the administration of public libraries. The skill and style of public library managers – the directors, branch managers, and department and service managers who are leading these institutions – strongly affects the culture of a public library. Library staff looks to these managers to help them navigate through the rapid changes that are occurring in public libraries as these changes in technology, roles, and user expectations strongly alter their daily routines of public service. Contemporary library managers need a wider array of skills and attributes than their earlier and more traditional counterparts and will need to seek continual professional development to remain effective as public libraries transition into the twenty-first century. These managers will also need to distinguish between management and leadership skills and learn to identify and mentor leaders within their staff who can assist in the transition. This paper is a brief scan of the literature currently available on managing libraries and includes information on academic as well as public libraries due to the above-mentioned lack of public library material. Weiner reviewed the literature extant on leadership in academic libraries and surveyed materials on “recruitment, leadership potential identification, career development, roles and responsibilities, and characteristics and management style”

CHAPTER 3

DESIGN

3.1 SOFTWARE REQUIREMENTS AND HARDWARE REQUIREMENTS

This section describes the hardware and software requirements of the system

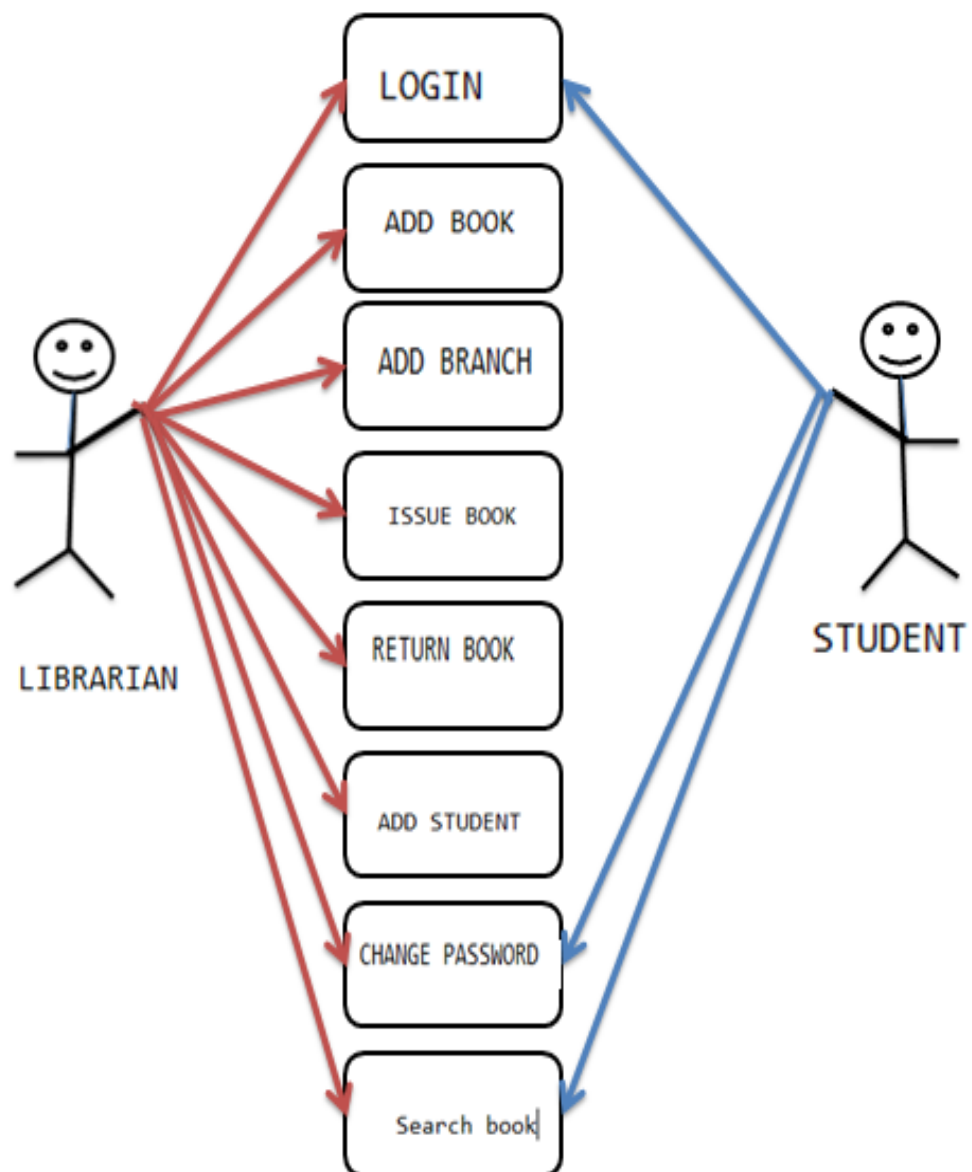
3.1.1 SOFTWARE REQUIREMENTS

- Operating System: Windows 10 is used as the operating system as it is stable and supports more features and it is more users friendly.
- Development tools and programming language: The whole project is developed using Eclipse IDE and the programming language used here is javaSE.

3.1.2 HARDWARE REQUIREMENTS

- Intel core i5 10th generation is used as a processor because it is faster.
- Ram 4 GB or above is used as it will provide fast reading and writing capabilities
- **Hard Disk** : 10GB or above
- **Input** : Keyboard and Mouse
- **Output** : Monitor or PC

3.2 UML diagram



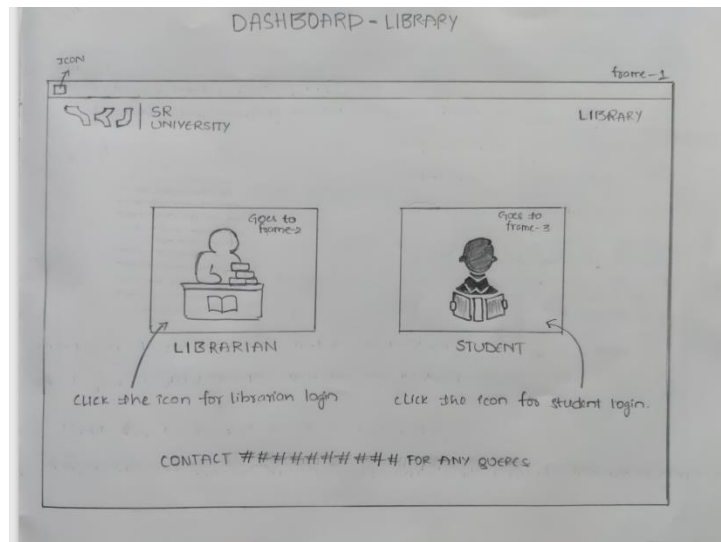


Fig 1:
Design diagram of the project

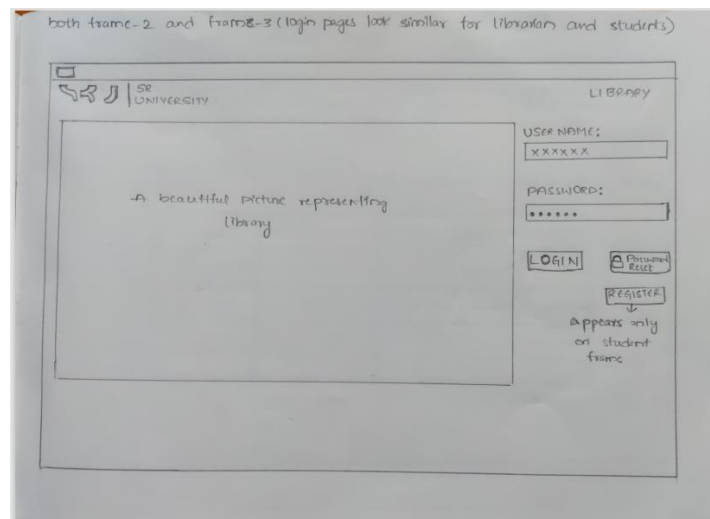


Fig 2

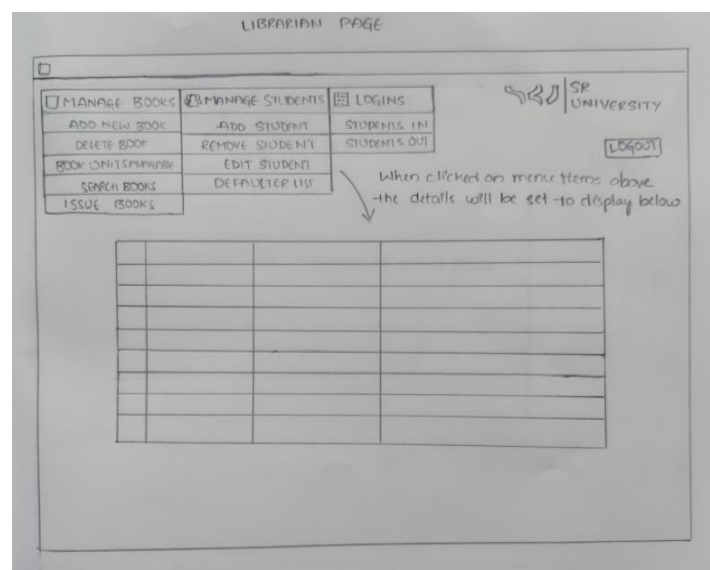


Fig 3:
Design diagram of the project

CHAPTER 4

IMPLEMENTATION

JFrame: The javax.swing.JFrame class is a type of container which inherits the java.awt.Frame class. JFrame works like the main window where components like labels, buttons, textfields are added to create a GUI.

Unlike Frame, JFrame has the option to hide or close the window with the help of setDefaultCloseOperation() method.

JLabel: The object of JLabel class is a component for placing text in a container. It is used to display a single line of read only text. The text can be changed by an application but a user cannot edit it directly. It inherits JComponent class.

JButton: The JButton class is used to create a labeled button that has platform independent implementation. The application result in some action when the button is pushed. It inherits AbstractButton class.

JComboBox: JComboBox is a part of Java Swing package. JComboBox inherits JComponent class. JComboBox shows a popup menu that shows a list and the user can select an option from that specified list. JComboBox can be editable or read- only depending on the choice of the programmer.

setBounds(): Moves and resizes this component. The new location of the top-left corner is specified by x and y, and the new size is specified by width and height.

setDefaultCloseOperation(): Sets the operation that will happen by default when the user initiates a "close" on this frame. You must specify one of the following choices:

- **DO_NOTHING_ON_CLOSE (defined in WindowConstants):** Don't do anything; require the program to handle the operation in the windowClosing method of a registered WindowListener object.
- **HIDE_ON_CLOSE (defined in WindowConstants):** Automatically hide the frame after invoking any registered WindowListener objects.
- **DISPOSE_ON_CLOSE (defined in WindowConstants):** Automatically hide and dispose the frame after invoking any registered WindowListener objects.
- **EXIT_ON_CLOSE (defined in WindowConstants):** Exit the application using the System exit method. Use this only in applications.

setLayout(): Sets the LayoutManager. Overridden to conditionally forward the call to the contentPane.

setVisible(): Shows or hides this Window depending on the value of parameter boolean b.

addActionListener():Adds an ActionListener to the button.

ActionListener():The listener interface for receiving action events. The class that is interested in processing an action event implements this interface, and the object created with that class is registered with a component, using the component's addActionListener method. When the action event occurs, that object's actionPerformed method is invoked.

actionPerformed():Invoked when an action occurs.

ActionEvent: A semantic event which indicates that a component-defined action occurred. This high-level event is generated by a component (such as a Button) when the component-specific action occurs (such as being pressed). The event is passed to every ActionListener object that registered to receive such events using the component's addActionListener method.

add():This method changes layout-related information, and therefore, invalidates the component hierarchy. If the container has already been displayed, the hierarchy must be validated thereafter in order to display the added component.

getContentPane():Returns the contentPane object for this frame.

removeAll():Removes all the components from this container. This method also notifies the layout manager to remove the components from this container's layout via the removeLayoutComponent method.

repaint(): Repaints this component.If this component is a lightweight component, this method causes a call to this component's paint method as soon as possible. Otherwise, this method causes a call to this component's update method as soon as possible.

addItem():Adds an item to the item list. This method works only if the JComboBox uses a mutable data model.

setText():Defines the single line of text this component will display. If the value of text is null or empty string, nothing is displayed.

File():Creates a new File instance by converting the given pathname string into an abstract pathname. If the given string is the empty string, then the result is the empty abstract pathname.

FileWriter(): Constructs a FileWriter given the File to write and a boolean indicating whether to append the data written, using the platform's default charset.

BufferedWriter():Creates a buffered character-output stream that uses a default-sized output buffer.

Overview of technology:

In this Project four text Documents are created for storing the data and retrieving. We created a Graphical user interface for library management.

Window1: In this window we used JButtons and JFrame and JLabel.

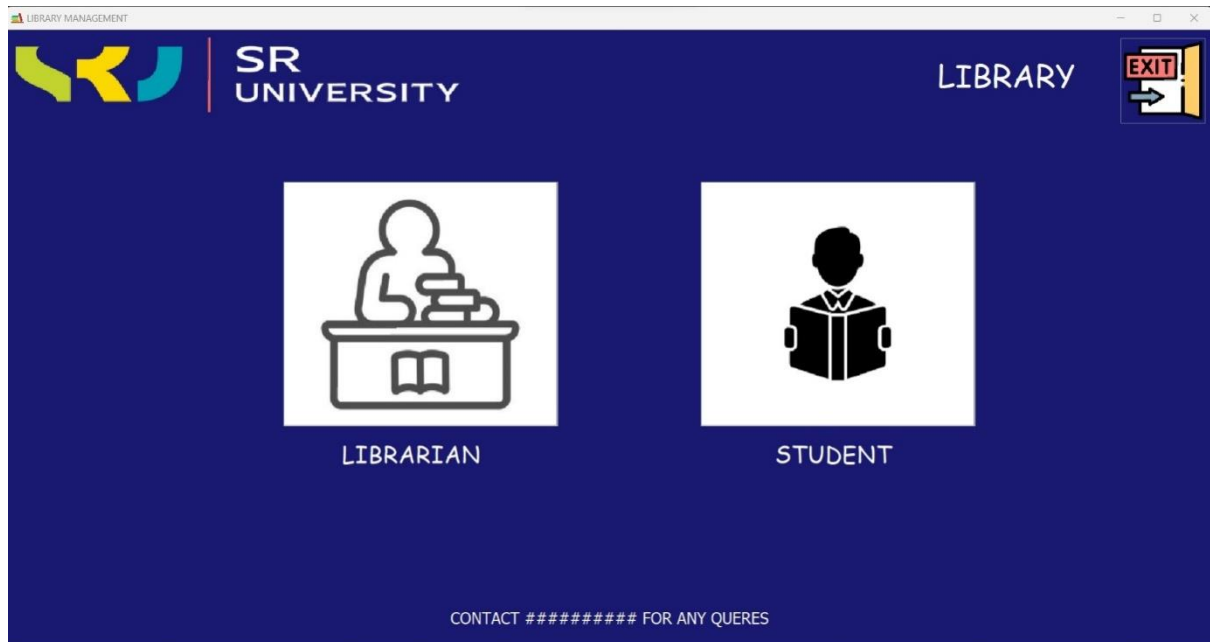


Fig 4: Window 1

By clicking on the logo embedded buttons, the user is directed to respective window.

Window2: In this window librarian logs into his data page

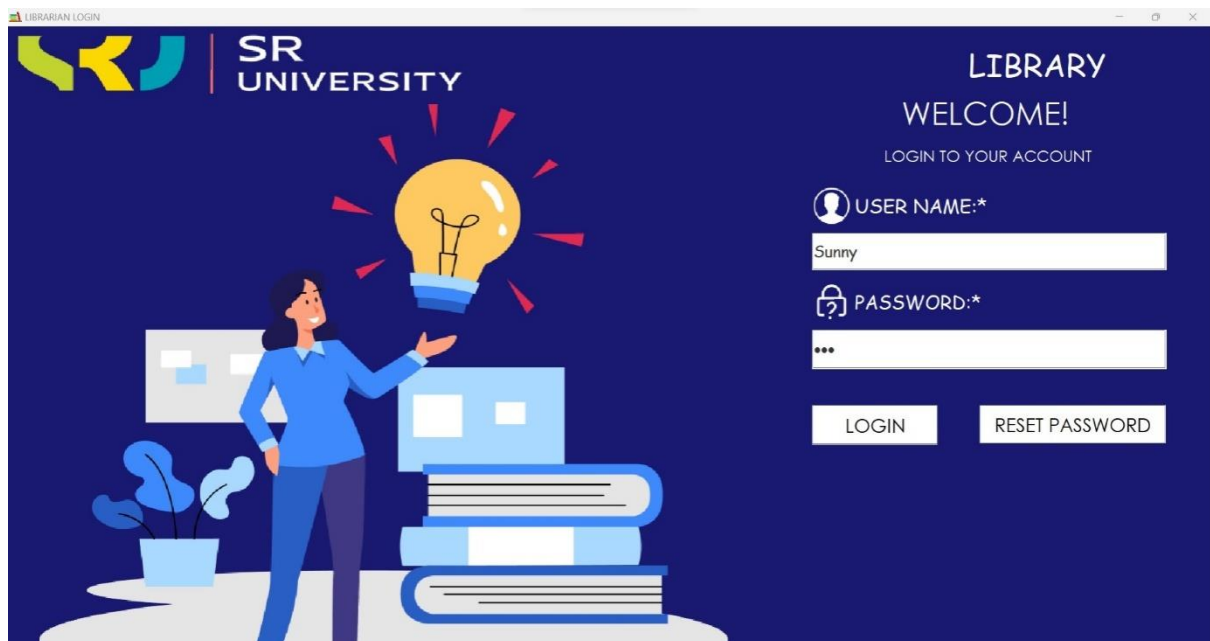


Fig5: window 2

JFormattedTextField and JPasswordField are used with combinations of JButton and JLabels

Window3: The librarian can reset his Username and Password in this page

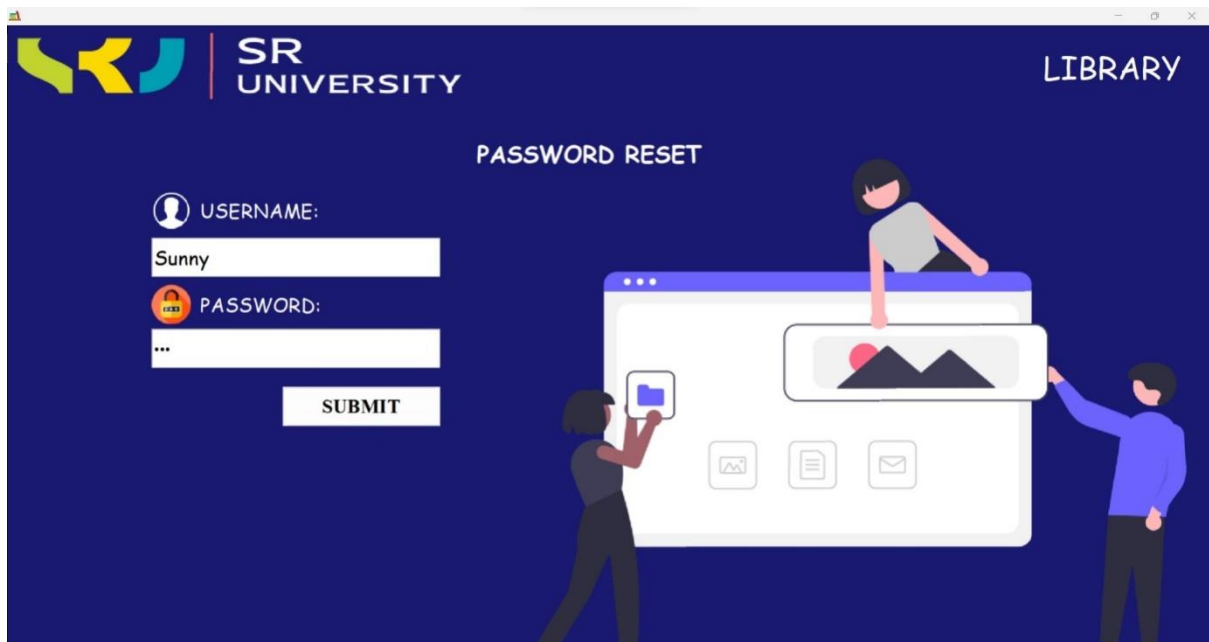
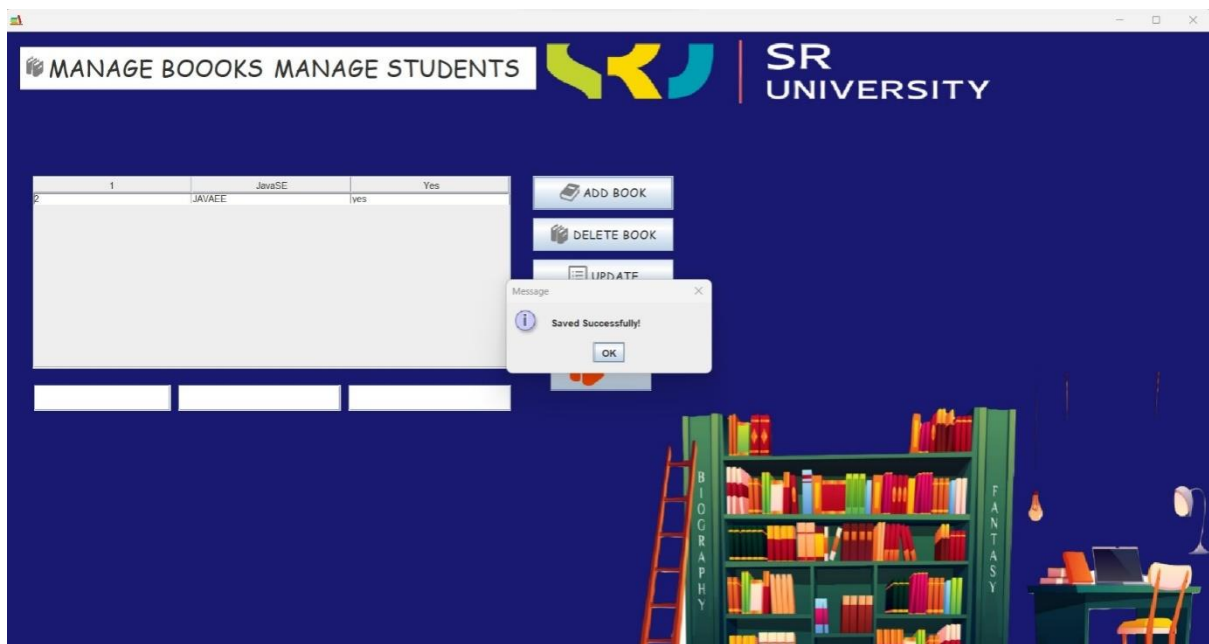


Fig6: window 3

Window4: It consists of menu respected to librarian where he can access all his data.



JMenuBar, JMenuItems and JButtons and JOptionPane are used in combination to save and access the data.

Fig7: window 4

Window5: Student can login into their menu for accessing the data of library.

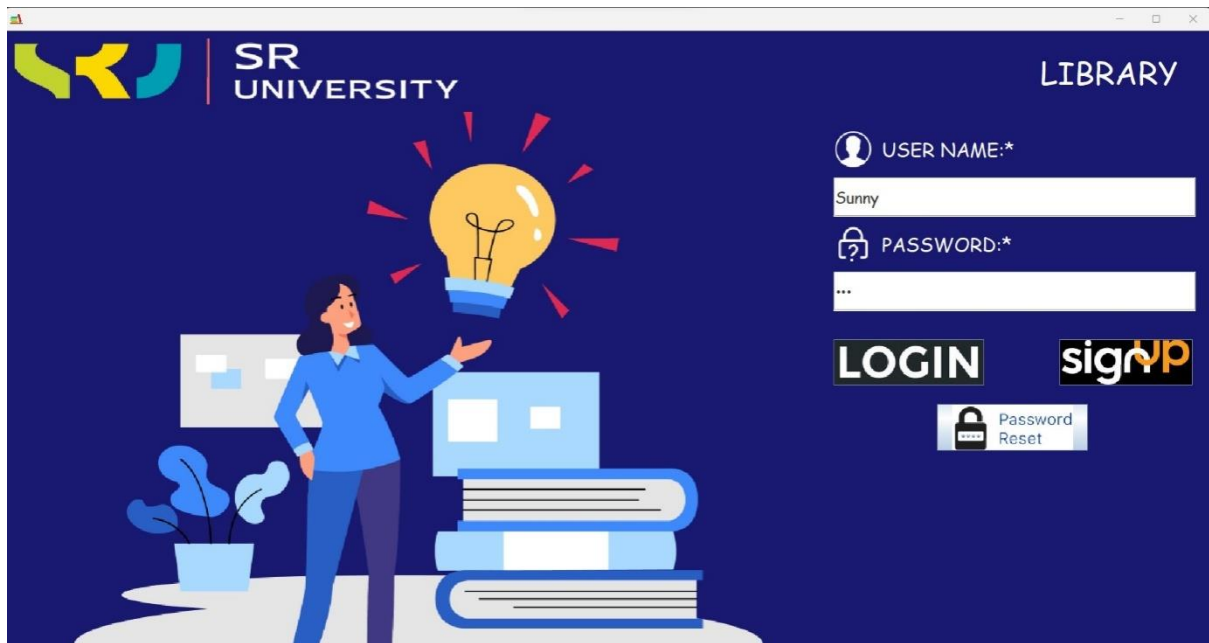


Fig8: window 5

similar to librarian login same elements are used and a text file in background stores username and passwords.

Window6: Studentreset page is created using swings and data is stored into text file.

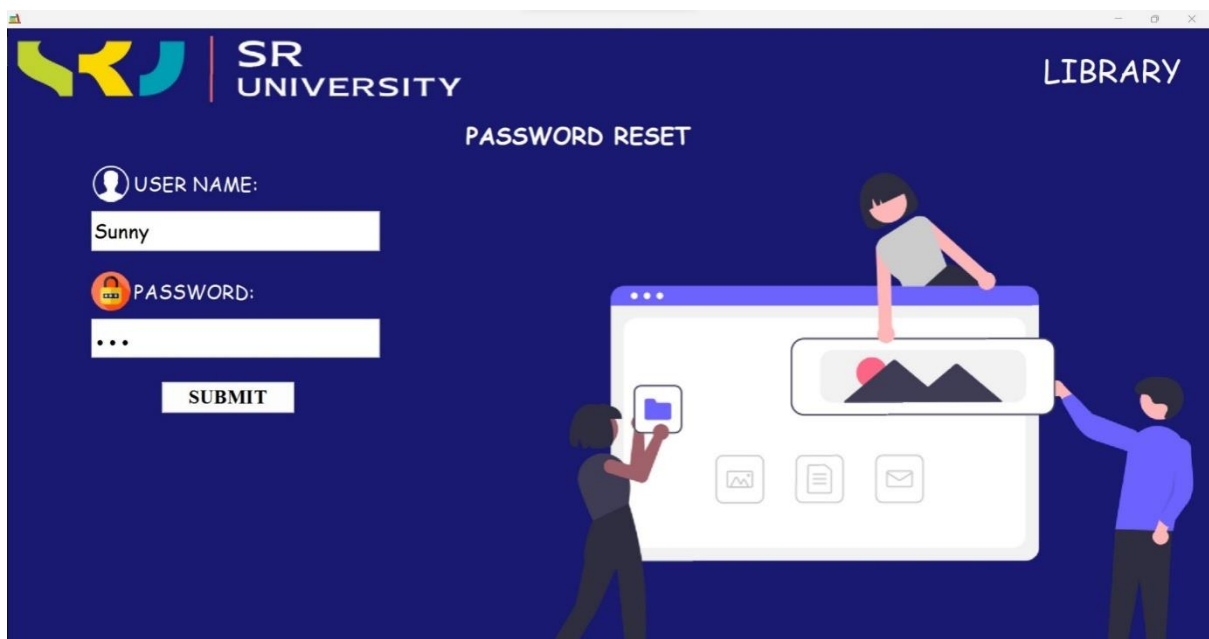


Fig9: window 6

The fields take input and stores it while clicked button and take us to login page.

Window7: Student signup page using JPasswordField and JButtons

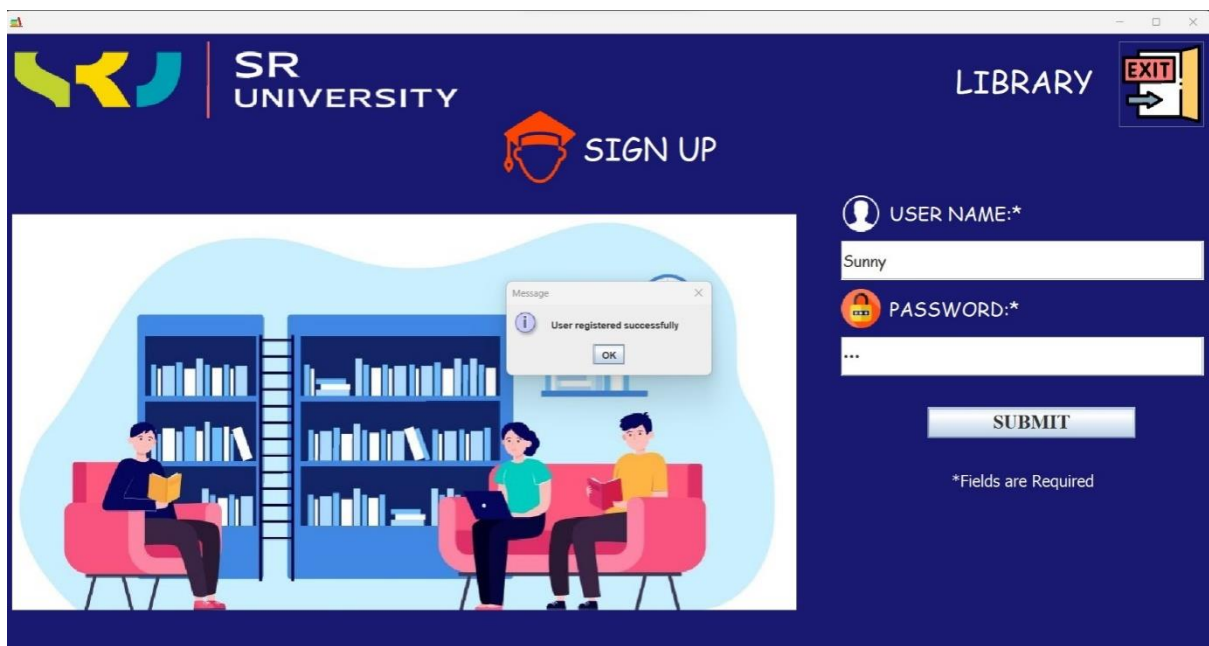


Fig10: window 7

The user can register here for his account.

Window8: Student menu page is created where the data of records can be seen.

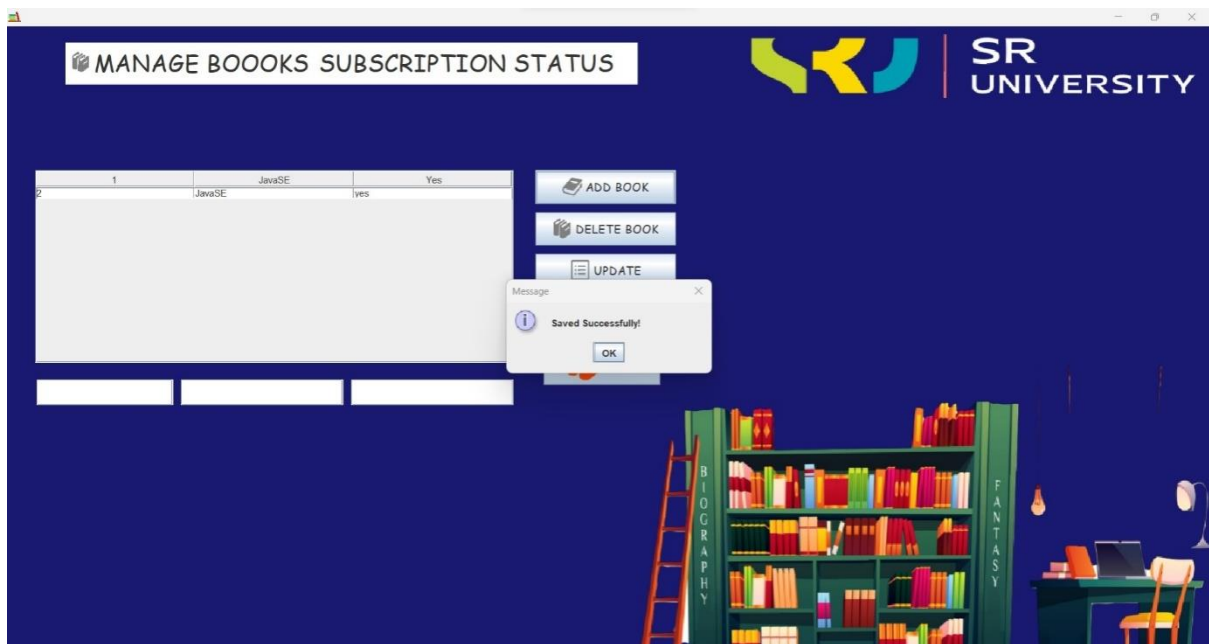


Fig11: window 8

Using JTable and JMenu we created a menu for student data.

CHAPTER 5

RESULTS

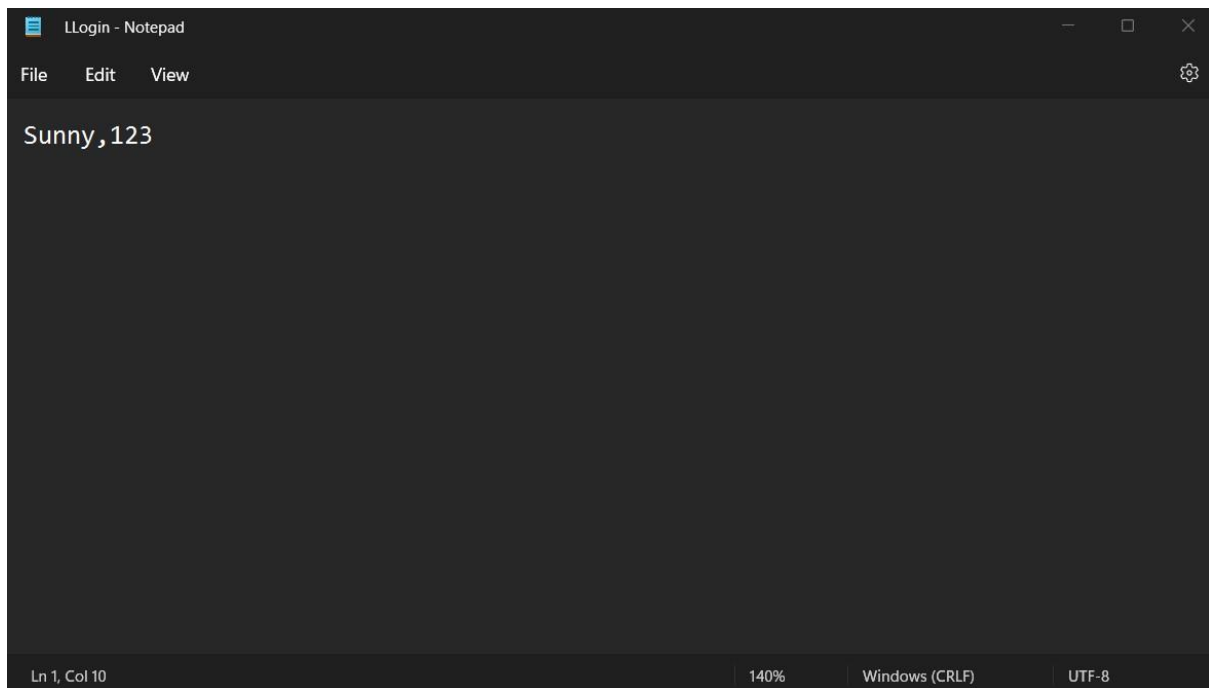


Fig11: text file test.

A screenshot of a login form on a dark blue background. The form has two input fields: 'USERNAME:' with the text 'Sunny' and 'PASSWORD:' with three dots. A 'SUBMIT' button is at the bottom right. The form is partially obscured by a 'PA' watermark in the top right corner.

Fig12: Login test.

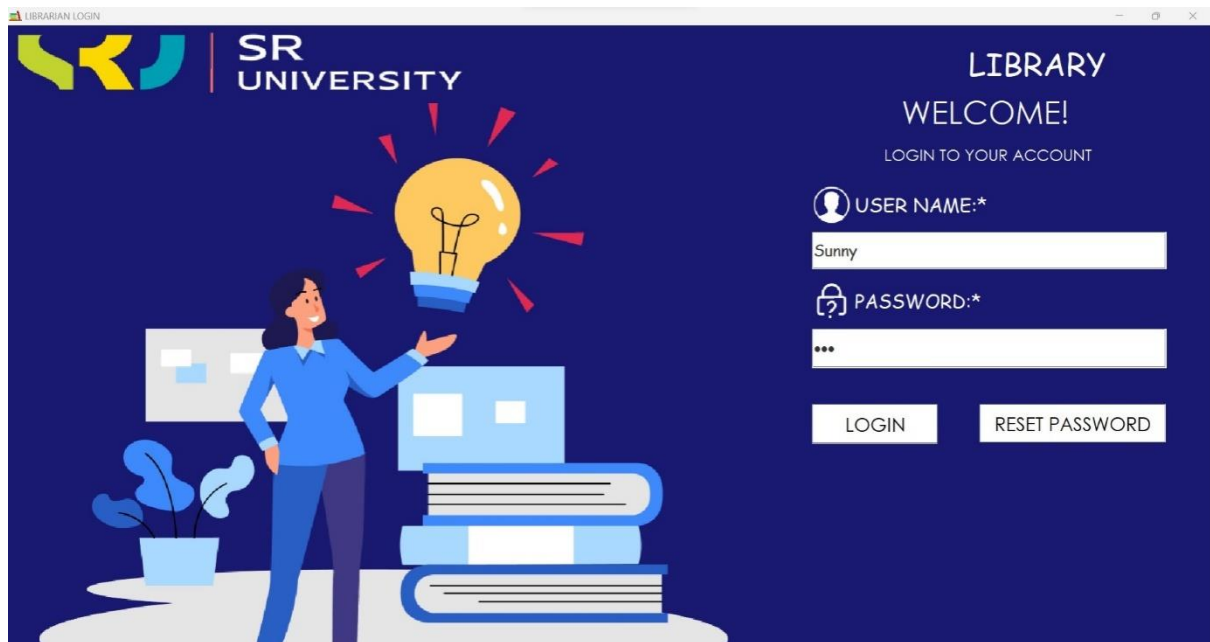


Fig13: Librarian logintest.

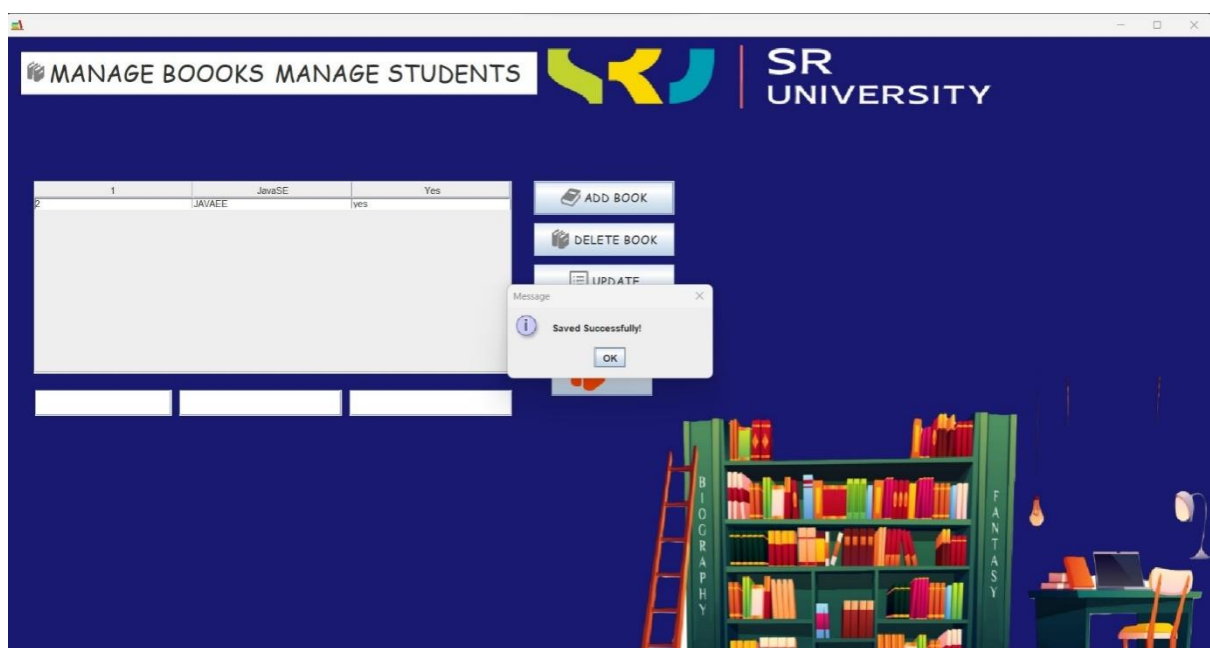


Fig14: Librarian menu test saving data.

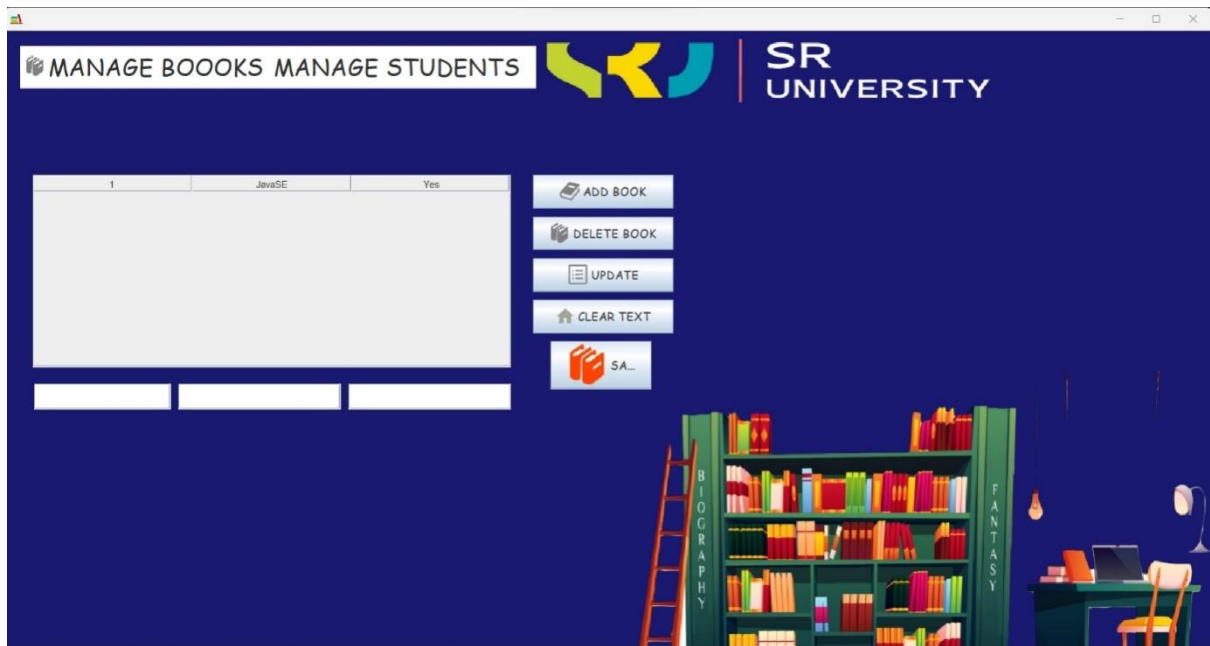


Fig15: Librarian menu test clearing data.

 USER NAME:

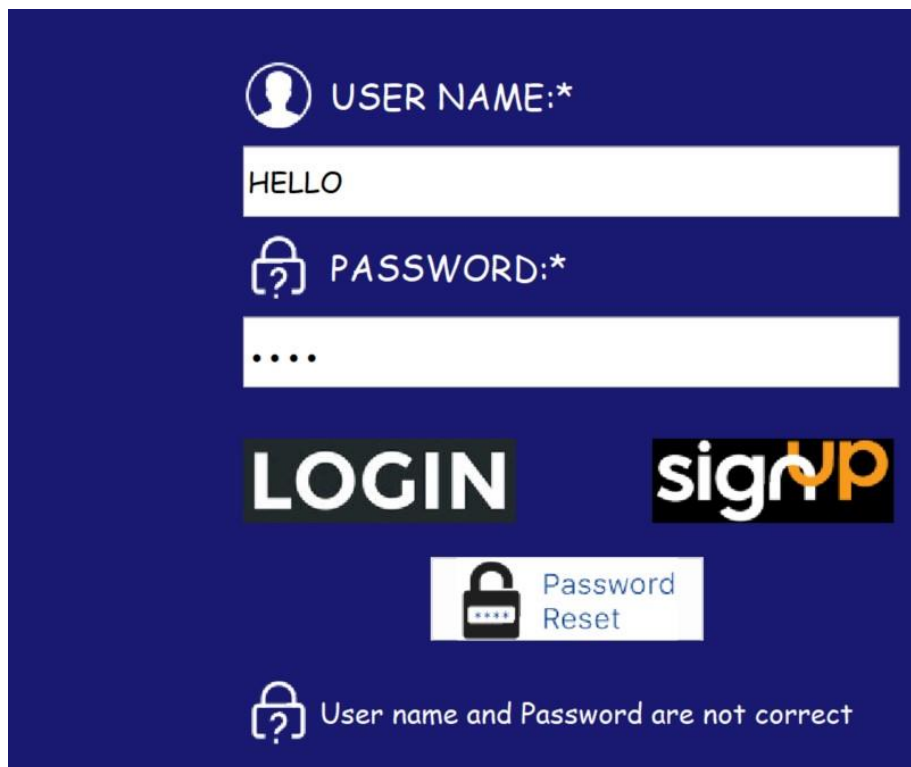
Sunny

 PASSWORD:

...

SUBMIT

Fig16: Student Reset test.



A screenshot of a login interface on a dark blue background. At the top, there is a user icon and the text "USER NAME:*". Below this is a white text input field containing the word "HELLO". Underneath the username field is a lock icon and the text "PASSWORD:*". Below the password field is another white text input field containing four dots. In the center, there are two buttons: "LOGIN" in white text on a dark blue background, and "sign up" in white and orange text on a dark blue background. Below these buttons is a "Password Reset" link with a lock icon. At the bottom, there is a lock icon and the text "User name and Password are not correct".

USER NAME:*
HELLO

PASSWORD:*
....

LOGIN sign up

Password Reset

User name and Password are not correct

Fig17: Student login test.



A screenshot of the same login interface as in Fig17, but with different input values. The "USER NAME:*" field now contains the word "Sunny". The "PASSWORD:*" field contains three dots. The "LOGIN" and "sign up" buttons are still present. The "Password Reset" link is also visible. The error message at the bottom is no longer present.

USER NAME:*
Sunny

PASSWORD:*
...

LOGIN sign up

Password Reset

Fig18: Student Clicking Login or Signup.

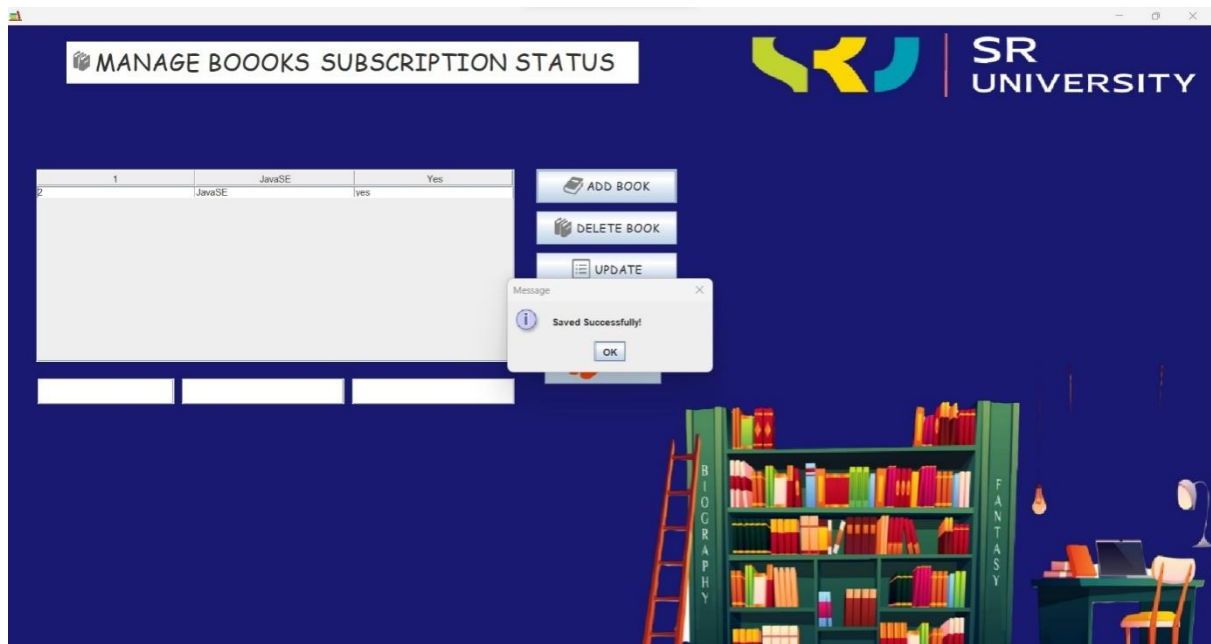


Fig19: Student menu test saving data.

CHAPTER 6

CONCLUSION

The hindrance and issues of the traditional library are identified and promote it to easy access for the libraries. In the Library Management system, the librarian can add/update/remove the student and book details. The students have a Unique ID for accessing any book from the library. Through the ID, the librarian can check the user details, fine payment, and book details. The LMS reduces labor work and makes the system efficient. In future work, we planned to enhance the LMS by integrating the LMS with Local area Network (LAN) which increases the efficiency of the system.

CHAPTER 7

FUTURE SCOPE

In a nutshell, it can be summarized that the FUTURE SCOPE of the project circles around marinating regarding:

- All the libraries can use this software very easy form.
- The information of books can be providing very easy.
- Module is use to search the student issue books information.

The LMS reduces labor work and makes the system efficient. In future work, we planned to enhance the LMS by integrating the LMS with Local area Network (LAN) which increases the efficiency of the system.

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