## JAVA SWING PROJE RAPOR



**ADI:** Hala Jabban

**STU NO: 2121221350** 

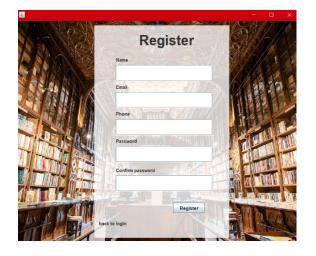
DATA: 21.12.2024 END: 28.12.2024

## LIBRARY MANAGEMENT

The Library Management System is a system used to organize and manage library-related operations. It aims to facilitate the management of books, members, and procedures related to borrowing and returning. You have 14 days to return a book; otherwise, late fees will apply. Additionally, you can rent any book you want.

## How to design a library Management:

The code handles user registration by validating inputs using **Regex** to ensure the phone number is numeric. It also checks that all fields are required, the password is strong, and the passwords match. If the inputs are valid, a new user object is created and saved, then the fields are cleared, with the option to navigate back to the login page.

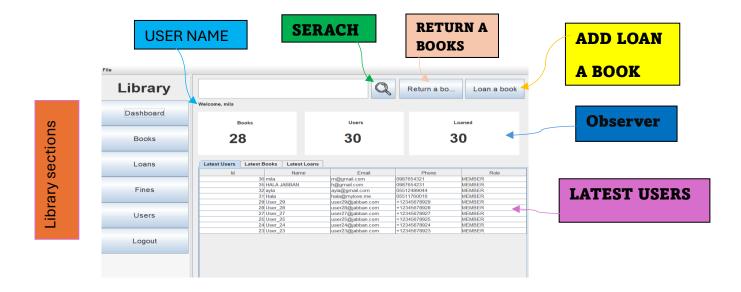


The code represents a login window using Java Swing.

It verifies the entered data when clicking "Login" and opens the dashboard if valid or shows an error if invalid. Clicking "Register" opens the registration window. The background has a transparent image for a better design.

**Purpose:** To manage the login process and navigate between windows based on user input.





1) The part of the code you sent is from the DashboardFrame class in Java using the **Swing** library to build user interfaces. In the DashboardFrame() constructor, it checks whether the user is logged in using the Helper.isLoggedIn() method. If the result shows that the user is not logged in (or there is no active session), the current window is closed using this.dispose() and the **Login** window (LoginFrame) is opened.

The code represents that uses the Observer design pattern.

**Observer (interface):** It is an interface that contains the update() method, which must be implemented by the observers. The observer receives the updated value in this method.

## 2) Search Window (SearchFrame):

A sub-window for searching books, sets the initial text, and closes without affecting the main application.

## **Graphical Components:**

**Text Field Search Button Check Boxes Results Container** 

## **Swing Usage:**

JTextField: For text input.

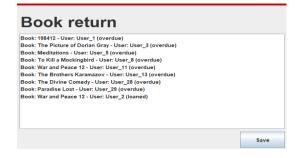
**JButton**: For the search button.

JCheckBox: For genres.

JPanel: For layout



## 3) BOOK RETURN



1) The code represents a panel that displays a list of books using Java Swing. It includes:

**JTable**: Displays the list of books.

JComboBox: Allows editing book categories.

**Context Menu**: Provides an option to delete a book when right-clicking on a row.

**Event Handling**: Opens a new window to add a book when the "Add New Book" button is clicked.

The panel updates the book list using the **FrameObserver** pattern.

# 2) SearchListItem displays book details such as the ID, title, genre, and ISBN.

When the "loan" button is clicked, a new window **NewLoanFrame** opens to start the book loan process.

The components are arranged using **GroupLayout** to display them horizontally and neatly.

## Components used in the code:

JLabel: idLabel: Displays the book ID.

bookTitleLabel: Displays the book title.

bookGenreLabel: Displays the book genre.

bookGenreLabel1: Displays the ISBN number.

JButton: loanButton: Button to initiate the loan process.

**GroupLayout:** Used to arrange the components horizontally within the interface.

## 3) Components used in the frame:

JLabel: Used to display text labels (e.g., "Title", "Author", "ISBN", "Genre", "Published year", "Copies available").

JTextField: titleInput, authorInput, isbnInput, publishedYearInput: For entering book details such as title, author, ISBN, and publication year.

JComboBox: genreCombo: For selecting the book genre from a list of options.

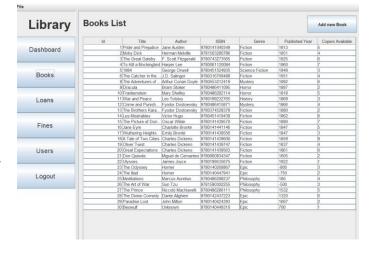
JSpinner:copiesInput: For entering the number of available copies.

JButton:saveButton: A button to save the new book and add it to the system.

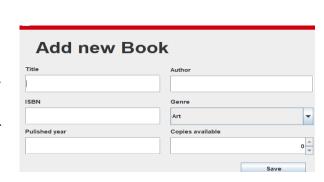
JOptionPane: For displaying messages to the user such as "Please fill all fields" or "Book added successfully".

GroupLayout: For arranging the components neatly in the interface.

FrameObserver: Used for the Observer pattern to notify observers when a new book is added



Book Id Book Title



Book Genre ISBN

The code represents a loan management panel using Java Swing. It includes:

JTable: To display the list of loans.

**JComboBox**: To select the loan status such as "loaned", "returned", "overdue".

**Context menu**: Provides an option to delete a loan when right-clicking on a row.

**Event handling**: When the "Add new loan" button is clicked, a new window for adding a loan opens.

**FrameObserver**: The loan list is updated when any modification occurs.

The main function is to display and manage loans, updating the list as needed.

The code creates a window for adding a new loan in the

application using Java Swing. When the window is opened:

- 1. Users with the role "member" and available books are loaded.
- 2. A default due date is set to 14 days from the current date.
- 3. When the "Save" button is clicked:

It checks if all fields are filled.

A loan is created and saved to the database.

Observers are notified of the update.

4. The window is closed after the loan is saved.

JTable: To display data in a table containing fine information.

**JPopupMenu**: To create a context menu that appears when the right mouse button is clicked on the table.

**JMenuItem**: A menu item in the context menu, used here for deleting a fine.

**JOptionPane**: To display confirmation messages (such as confirming the deletion of a fine) or error messages.

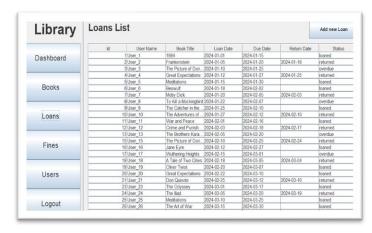
**MouseAdapter**: To listen for mouse events, especially to detect clicks for opening the context menu.

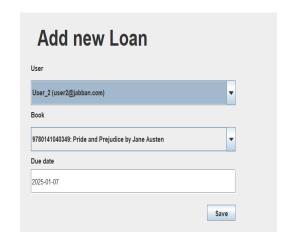
**FrameObserver**: An interface implemented in the code, allowing the fine data to be updated when changes occur.

List: To store the fines loaded from the database.

Fine Table Model: The data model used to bind data to the JTable.

**Swing Layouts**: Layout management using GroupLayout and JScrollPane for displaying tables in an organized manner.





ld	Book Title	User Name	Fine Amount	Status
	1 The Picture of Dorian Gray	User 3	15.5	0
	2 To Kill a Mockingbird	User_8	10.25	1
	3 The Brothers Karamazov	User_13	5.75	0
	4 Wuthering Heights	User_17	20.0	1
	6 The Divine Comedy	User_28	8.0	1
	7 1984	User_1	7.5	0
	8 Meditations	User_5	9.25	1
	9 The Catcher in the Rye	User_9	6.75	0
	11 Oliver Twist	User_19	4.25	0
	12 The Odyssey	User_23	3.0	1
	13 The Prince	User_27	13.5	0
	14 Frankenstein	User_2	18.25	1
	15 Beowulf	User_6	22.0	0
	16 The Adventures of Sherlock	User_10	16.5	1
	17 The Picture of Dorian Gray	User_15	9.75	0
	18 A Tale of Two Cities	User_18	5.0	1
	19 Great Expectations	User_20	14.75	0
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In the code, the following elements are used:

JTable: To display the list of users in a table.

**JComboBox**: To edit the user role (librarian or member) in the "Role" column of the table.

**JScrollPane**: To provide scrolling when displaying the table.

JButton: A button to add a new user.

DefaultCellEditor: To edit the "Role" column using a

JComboBox.

Event Handling: To open a new window to add a user when the

button is clicked.

Observer Pattern: To observe updates from the "NewUserFrame" window and notify the UsersPanel.

UserTableModel: To bind the data to the table and update it automatically.

These components are used to create an interactive interface for managing users.

#### Explanation of the Code:

The NewUserFrame class is a GUI form that allows the creation of a new user.

## Components used:

#### JTextField:

**nameInput, emailInput, userNameInput, passwordInput**: Text fields for entering user details such as name, email, phone, and password.

IR adio Rutton	·librarianRadio	mamberRadio: Radio	buttons to select the	user's role	(librarian or n	nember)
omauiopuitoii	· IIDI ai iaiiiXauiu	mamber Nauro, Maure	buttons to select the	user s rere	t norarian or n	.101111001 1.

But tonGroup: roleRadioGroup: Groups the radio buttons so that only one role can be selected at a time.

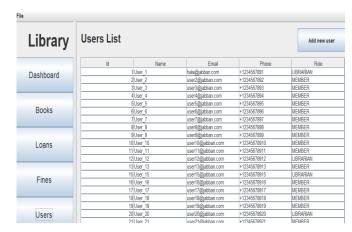
JButton: saveButton: Button to save the new user and register them.

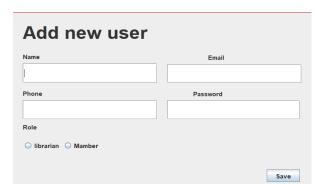
**JOptionPane**: For displaying error or success messages (e.g., "All fields are required", "User registered successfully").

**Observer Pattern: FrameObserver:** This is used to notify other parts of the system when a new user is registered.

## **Functionality:**

- The form collects user information (name, email, phone, password, and role).
- It performs validation on the inputs (e.g., checking if fields are empty, validating the password format, and ensuring the phone number is numeric).
- After validation, it creates a new User object, saves it, and notifies observers of the new user.
- The form is then closed after successful registration.





In the provided code, several components and techniques are used to manage interaction with the database:

- 1. JDBC (Java Database Connectivity)\*\*:
- Connection Establishes a connection to the database using 'Database.getConnection()'. Statement and PreparedStatement: Used for executing SQL queries. ResultSet: Captures the results from SQL queries.
- 2. Queries: SELECT is used to retrieve data.

INSERT, UPDATE, and DELETE are used to modify data in the database.

- 3. Function<ResultSet, T>: This technique passes a function to map data retrieved from the database and convert it into an object of type `T`.
- 4. Error Handling: JOptionPane is used to display error messages to the user.
- 5. Transaction Handling: connection.setAutoCommit(false) is used to disable auto-commit and execute multiple queries within a single transaction. If any query fails, changes are rolled back using connection.rollback()
- 6. Prepared Statements: PreparedStatementis used to execute queries that require input data, helping to protect against SQL injection attacks.

These components ensure secure and efficient communication with the database.

The Database class manages the connection to a MySQL database and handles basic operations:

- 1. **getConnection()**: Establishes and selects the database connection.
- 2. **closeConnection()**: Closes the database connection.
- 3. **instantiateDatabase()**: Initializes the database setup.
- 4. **createDatabase()**: Reads and executes an SQL script to create tables.
- 5. **executeSqlScript()**: Executes an SQL script in the database.

It handles driver loading, connection management, and executing necessary setup scripts for the database.

## The code does the following:

**Imports**: Imports **LoginFrame** for the login interface. Imports **User** to represent the user. Imports **Database** to set up the database.

Libmanager Class: authenticated User: Holds the authenticated user.

main Method: Initializes the database using Database.instantiateDatabase().

Displays the **LoginFrame** for user login. This is the main program for the library management application.

The Helper class contains utility methods for:

- 1. **readFileFromInputStream**: Reads the content of a file from a given path.
- getAuthenticatedUser and setAuthenticatedUser: Get and set the authenticated user.
- 3. **isLoggedIn**: Checks if a user is logged in.
- 4. **validatePassword**: Validates a password using a regular expression.

```
protected abstract T apply(ResultSet resultSet);
public abstract List<T> getAll(String queryFilter);
public abstract T getById(int id);
public abstract Integer add(T entity);

public abstract void update(T entity);

public abstract void delete(int id);

public abstract void delete(int id);

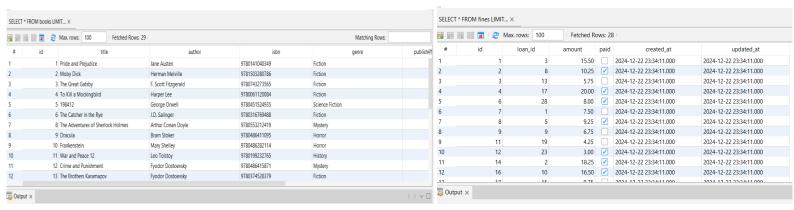
public int count(String queryFilter) {
    String query = "SELECT COUNT(*) FROM " + getTableName() + queryFilter;
    try (Connection connection = Database.getConnection();
    ResultSet resultSet = statement.executeQuery(sq:query)) {
    if (resultSet.next()) {
        return resultSet getInt(columnindex: 1);
    }
} catch (SQLException e) {
        JOptionPane.showNessageDialog(parentComponent: null, message: "Could not execute the que throw new RuntimeException(case: e);
}
```

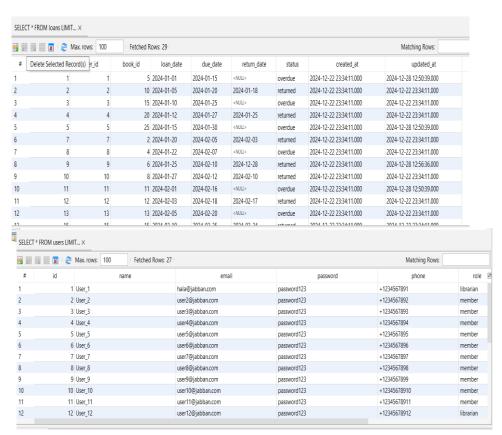
```
public class Libmanager {
   public static User authenticatedUser;
   public static void main(String[] args) {
        Database.instantiateDatabase();

        LoginFrame loginFrame = new LoginFrame();
        loginFrame.setVisible(b: true);
   }
}
```

- 5. **getCurrentDate**: Returns the current date and time.
- 6. **isNumeric**: Checks if a string contains only numeric characters.
- 7. **DateFromString and DateToString**: Converts between a string and a Date object.
- 8. **getFutureDate**: Returns a date that is a specified number of days from the current date.

#### **REASULT DATABASE:**





✓ If you want to see my prograimg,

I have put a short video you can watch



