GROUP MEMBERS:

NASHRA AZHAR - 081

FIZZAH RAFIQ - 075

HUMNA SHERAZ – 083

INSTRUCTOR:

SIR ADEEL KHALID

SUBJECT:

OOP/ DATABASE

DEPARTMENT OF COMPUTER SCIENCE
FATIMA JINNAH WOMEN UNIVERSITY,
RAWALPINDI.

Project Report

Library Management System

Introduction:

This Library Management System is a desktop-based application designed using **Java Swing** for the GUI, **Oracle SQL** as the backend database, and **JDBC** as the connectivity bridge. The system enables smooth handling of key library operations such as managing books, issuing and returning books, tracking statistics, managing readers and staff, and logging user activities.

Objectives

- To create an intuitive and aesthetic interface for library users.
- To ensure robust and secure database interaction using JDBC.
- To allow librarians/admins to manage books, staff, readers, and issued/returned books effectively.
- To practice real-world integration between frontend and relational database systems.

Tools & Technologies Used

- **Programming Language**: Java
- **GUI Framework**: Java Swing
- **Database**: Oracle SQL
- **Connectivity**: JDBC (Java Database Connectivity)
- **IDE**: Eclipse
- **Image Resources**: Custom library image for aesthetics

System Features

1. **Authentication Module**
   - Admin login screen with password masking
2. **Dashboard**
   - Central navigation hub (Welcome screen)
3. **Book Management**
   - Add, delete, and update book records
4. **Reader Management**
   - Manage reader profiles and IDs

5. **Issue Info**
    - Record and view issued books
    - Includes Book ID, Reader ID, and Issue Date

6. **Return Book**
    - Handles book return entries

7. **Statistics**
    - Placeholder for future analytical reports

System Architecture

Client (Java Swing GUI) → JDBC → Oracle SQL DB

- All operations like login, data retrieval, and updates interact with the database via SQL queries executed through JDBC.

User Interface Overview

a. Login Screen

- Left: Username/Password input
- Right: Aesthetic bookshelf image
- Function: Verifies admin credentials

b. Main Menu

- Buttons for modules: Books, Issue Info, Staff, Readers, Return Book, Statistics, Logout
- Clear black/white theme with bold typography

c. Issue Info Window

- Form to enter Book ID, Reader ID, and Issue Date
- Displays issued records in a table

Database Design

Tables Used:

- BOOKS (Book_ID, Title, Author, Status)
- READERS (Reader_ID, Name, Contact)
- ISSUES (Book_ID, Reader_ID, Issue_Date)
- STAFF (Staff_ID, Name, Position)
- USERS (Username, Password)

Sample Data Flow

1. **Login** → Validate user → Show main menu
2. **Issue Book** → Enter details → Insert into ISSUES table
3. **Return Book** → Search book → Update status
4. **Logout** → Return to login screen

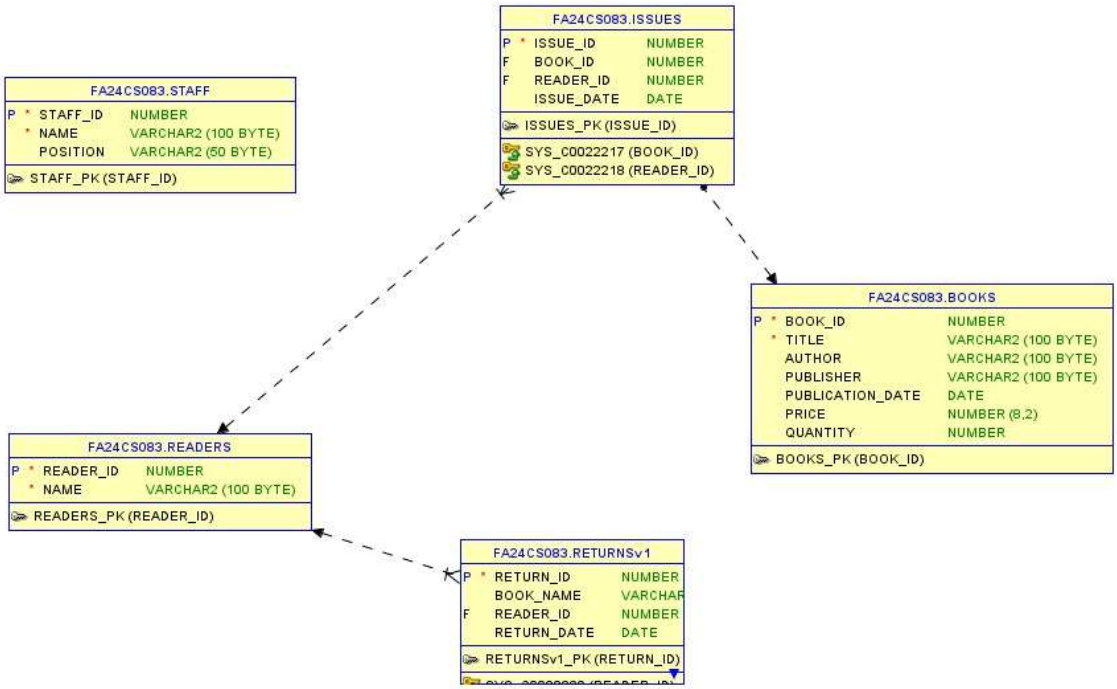
My Role in the Project

In this group project, I contributed mainly to the design and development of the user interface using Java Swing. I worked on the "Issue Book" and "Return Book" modules, where I designed the forms and helped connect them to the Oracle database using JDBC. I was also involved in writing and testing the code for some key features, such as issuing a book by entering Book ID and Reader ID. I helped in fixing some layout issues in the GUI and ensured that the forms were user-friendly. Throughout the project, I collaborated with my teammates, discussed progress regularly, and supported them wherever needed, especially in debugging and running the final version successfully.

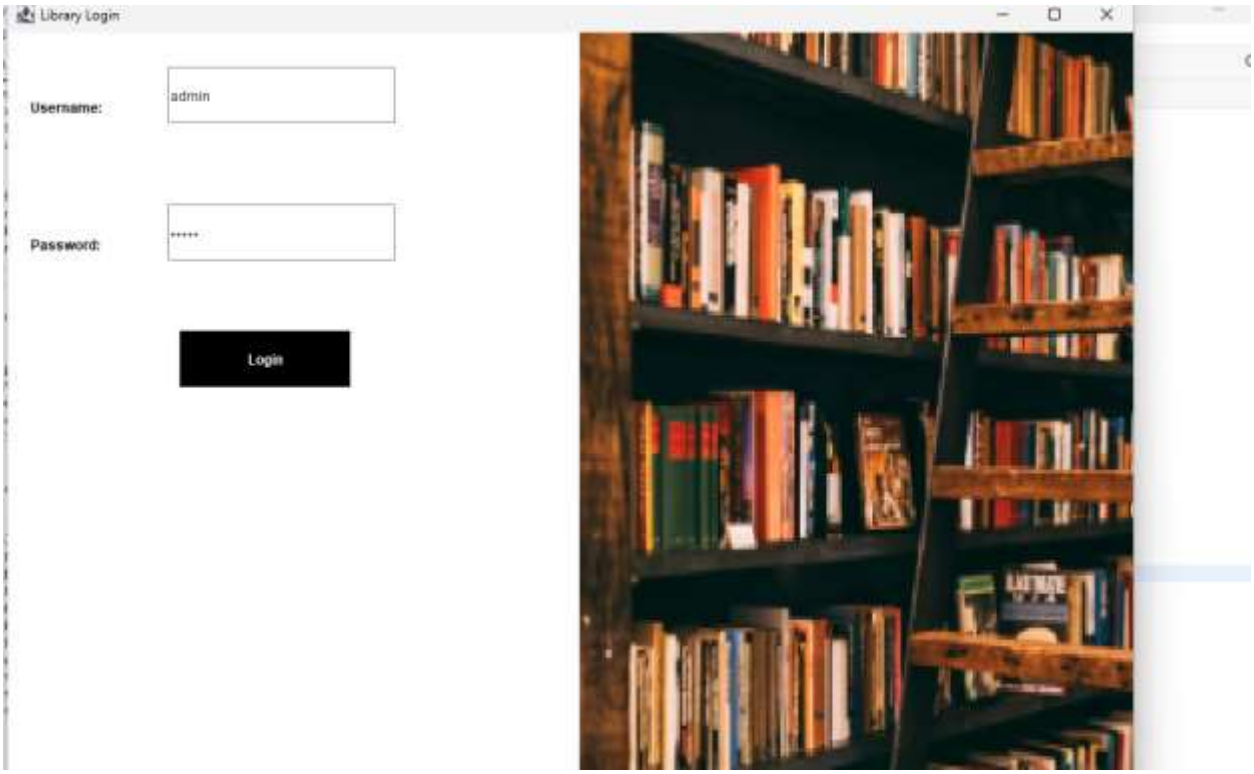
Conclusion

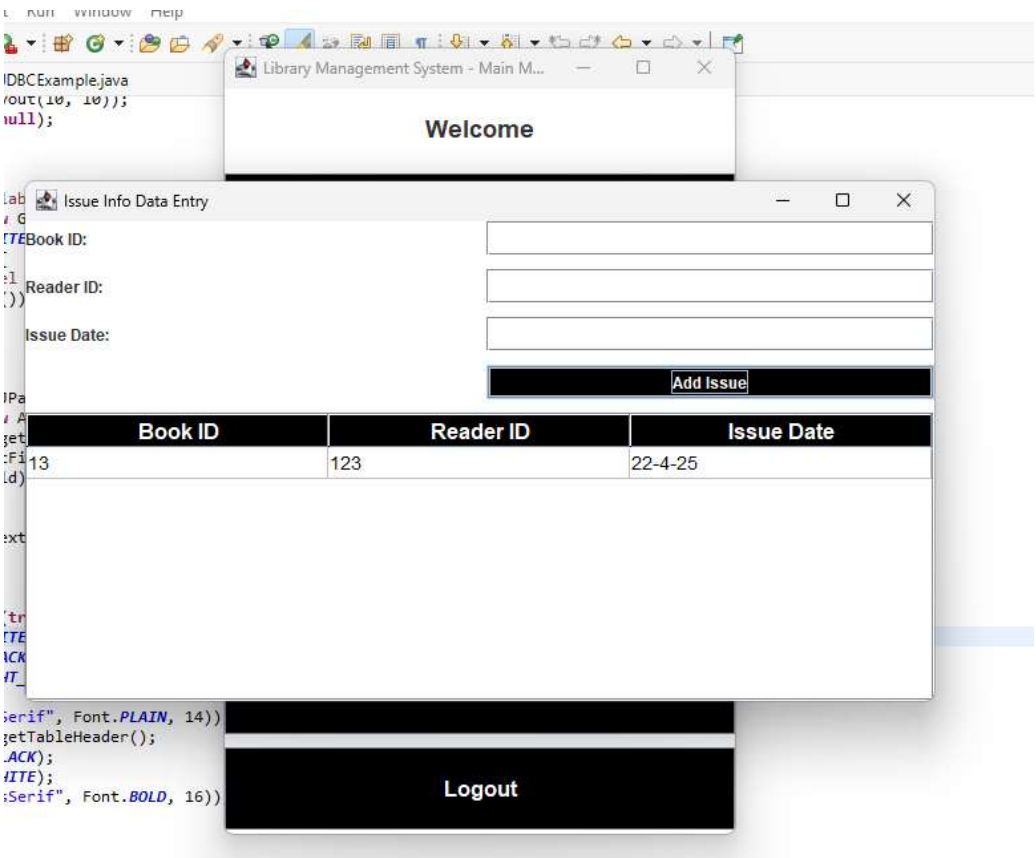
The Library Management System successfully digitizes book circulation and user records. It reduces manual errors and enhances operational efficiency. The intuitive GUI and database integration offer a seamless experience for library administrators.

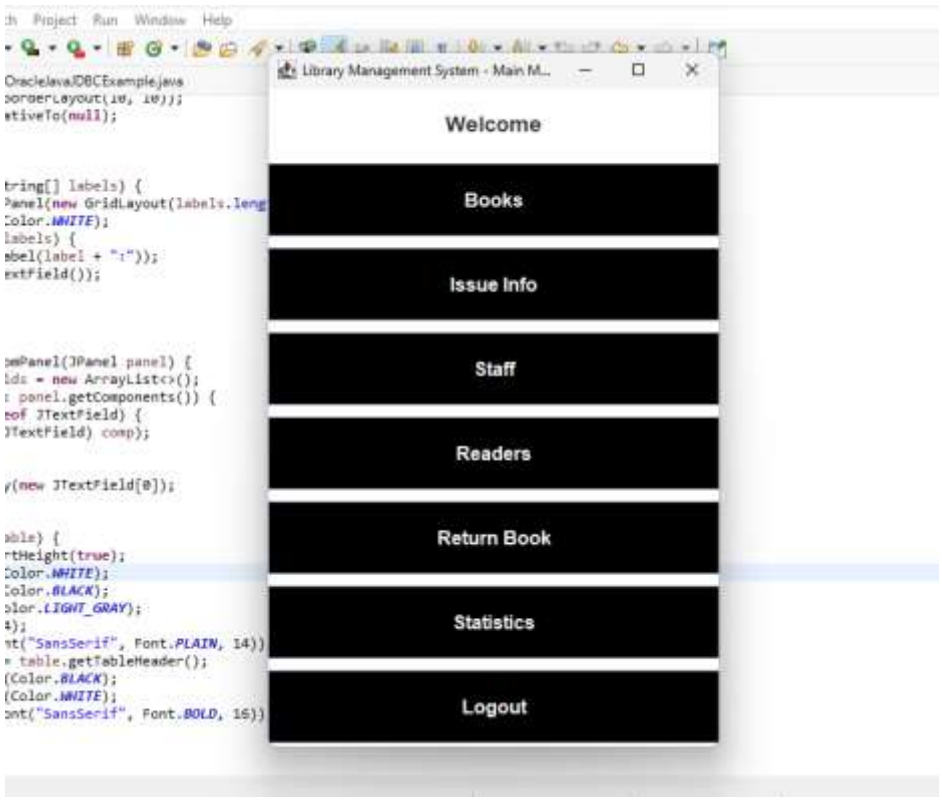
ER Diagram of Library Management System:

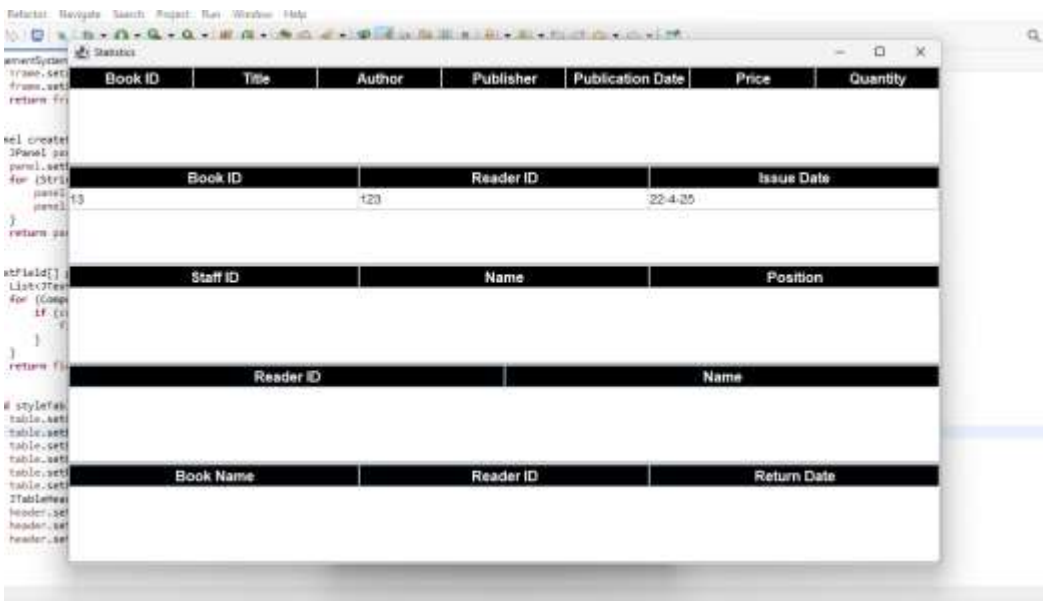


Screenshots of System:


Library Login
Username:
admin
Password:
Login


Library Management System - Main M...
Welcome
Issue Info Data Entry
Book ID:
Reader ID:
Issue Date:
Add Issue
Book ID
Reader ID
Issue Date
13
123
22-4-25
Logout


Library Management System - Main M...
Welcome
Books
Issue Info
Staff
Readers
Return Book
Statistics
Logout


Statistics
Book ID
Title
Author
Publisher
Publication Date
Price
Quantity
Book ID
Reader ID
Issue Date
13
123
22-4-25
Staff ID
Name
Position
Reader ID
Name
Book Name
Reader ID
Return Date