LIBRARY SYSTEM

[CSCI313 Project]

Amr Ahmed – 211000270
Adham Hossam – 211001699
Eyad Yehia - 211001231
Omar Elhawwari – 211002152

Table of Contents

1. Introduction

1.1 Purpose

The purpose of this document is to provide a detailed description of a library system application. In this document, we will outline the application's features, the system's user interface, and its intended function, as well as detail the admin's panel, testcases, and performance.

1.2 Project Scope

What we aim to achieve in this project is to build a stable, very well-optimized library system with many features that are yet to be decided. Security and access control: there will be various accounts to log in to the system one for the client and the other one for the admin to modify or update anything within the system. Reporting and analytics: this part is for the administrator which is going to show how many books have been borrowed or bought. and finally, the user interface we are going to make sure that it's a functional, useful GUI with a lot of features to use in a creative style.

1.3 Used Technologies

Mainly we are using Java as a programming language to build this library system as a start but there might be more technologies that are yet to be decided**.**

1.4 Intended Audience

We are targeting institutions, universities, or any library that needs a fully functional, well-optimized library system that satisfies their requirements**.**

2. Overall Description

2.1 Product Perspective

• The "Library System" will be a desktop application that provides a virtual library service for a real library.

• The application has two different modes:

1- Admin Mode
2- User Mode

both have different features and structures.

2.1.1 Product Function

• After Opening the application, a loading screen will be displayed. The next screen will be a screen to choose between modes or to register as a new user.

• Registration:

• If this was the user first time to use the application, a registration panel will be provided to create an account.

• The user will be requested to enter his E-mail, Username, Password & Password confirmation.

• An OTP will be sent the registered E-mail to check if the E-mail is correct and the user is requested to enter the OTP to continue using the application.

• After completing registering, the user will be redirected to the modes panel.

• Admin:

• If the user decided to choose the Admin Mode, he will be requested to enter his admin username and password (Generated automatically by the owner).

• After signing-in, a dashboard contains the main objects will be shown.

• Main objects:

1- Add New Book.
2- Remove Book.
3- Show Borrowed Books (By ID) & The Borrowers.
4- Hold Borrowing Period.
5- Accounts Details.
6- Logout.

• **User:**

• If the user decided to choose the User Mode, he will be requested to enter his username and password.

• If the user forgot his password, the "Restore Password" feature will be provided with an OTP for more security.

• After signing-in, a user panel contains services will be shown.

• User Panel Services:

1- Show All Books.
2- Borrow Book / Return Book.
3- User Information
4- Logout.

2.2. User Characteristics

• The user should have basic knowledge of how to use online systems & registration process.

• The user should have accessibility to internet connection.

2.3. Constraints

• The PC will have to be connected to internet in order for the application to work normally with the database, otherwise the user won't be able to access the application.

• Sign-in and password are a main require to identify users and admins.

2.4. Assumptions and Dependencies

• The application will be available for download as soon as the official website is published.

• The Application will require internet connection, so users are expected to have an accessible internet connection to use the application.

3. Functional Requirements

3.1. User Class 1: Admin

3.1.1. Functional Requirements

Title: Login

Description: System will allow the admin to login if a valid username and password were entered.

3.1.2. Functional Requirements

Title: Show Books

Description: System will allow the admin show all the books in the library.

3.1.3. Functional Requirements

Title: Add Books

Description: System will allow the admin to add a new book to the library.

Required Information:

- Category
- Name
- Author Name
- Publisher (Admin Username)

3.1.4. Functional Requirements

Title: Remove Book

Description: System will allow the admin to remove a book by the book ID.

3.1.6. Functional Requirements

Title: Borrowed Books

Description: System will allow the admin to show the borrowed books with the borrower username & ID and the return date.

3.1.7. Functional Requirements

Title: Close Borrowing Period / Open Borrowing Period

Description: System will allow the admin to stop books from borrowing for a while and re-open the borrowing method again.

3.1.8. Functional Requirements

Title: View Accounts Details

Description: System will allow the admin to show all registered users information.

3.1.9. Functional Requirements

Title: Logout

Description: System will allow the admin to logout from the system.

3.2. User Class 2: The User

3.2.1. Functional Requirements

Title: Registration

Description: System will allow the user to create an account so that they can login later.

Required Information:

- Username
- Password (at least 8 characters)
- Email (unregistered email)
- Phone number (Egyptian numbers only)

3.2.2. Functional Requirements

Title: Forgot Password?

Description: System will allow the user to reset the password by username & OTP that will be sent the registered email for more security.

3.2.3. Functional Requirements

Title: Login

Description: System will allow the user to login if a valid username and password were entered.

3.2.4. Functional Requirements

Title: Show books status

Description: System will allow the user to show the books status to know which book is available to borrow.

3.2.5. Functional Requirements

Title: Borrow Book

Description: System will allow the user to borrow a book (availability is a require).

3.2.6. Functional Requirements

Title: Return Book

Description: System will allow the user to return a borrowed book.

3.2.7. Functional Requirements

Title: User Panel

Description: System will allow the user to show his profile and his information.

Available Information:

- Registered Info. (username, email, password, phone number)
- Number of borrowed books
- Change Password (OTP is included to this feature)

3.2.8. Functional Requirements

Title: Logout

Description: System will allow the user to logout from the library.

4. Non-Functional Requirements

4.1. Reliability

• The system is estimated to fail at a mean time of 2 times per month.

4.2. Recoverability

• System should be able to recover after breakdown within maximum 2 hours.

4.3. Performance

• Pages should not take more than 5 seconds to load.

4.4. Availability

• The system should be available 24/7, with planned maintenance windows communicated in advance.

• In the event of scheduled maintenance, users should be notified in advance, and the system should provide a temporary offline mode with a user-friendly message.

4.5. Usability

• The user interface should be intuitive and user-friendly, catering to users with basic knowledge of online systems.

• The system should provide clear error messages and prompts to guide users in case of mistakes or incorrect inputs.

• The user will need a maximum of $\frac{1}{2}$ hour to be able to use the system.

4.6. Maintainability

• Code should be well-documented to facilitate easy maintenance and updates by other developers.

• The system should support seamless updates without causing disruptions to ongoing operations.

5. Interface

5.1. System Interface

Upon opening the application, users will encounter a loading page displayed prior to the application's initiation, as depicted in Figure 1. Users are presented with three sign-up options: login as an admin, login as a regular user, or register as a new user, as illustrated in Figure 2.

Opting to register as a user involves completing a form that includes fields for the username, password, email address, and phone number, as indicated in Figure 3. While registering, the system will automatically send an OTP for the provided email address to confirm registering with this email to enhance system security (currently under construction).

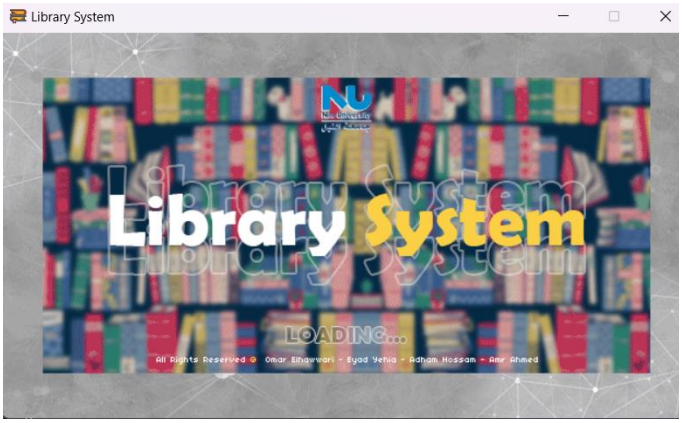

Figure 1: Loading Page

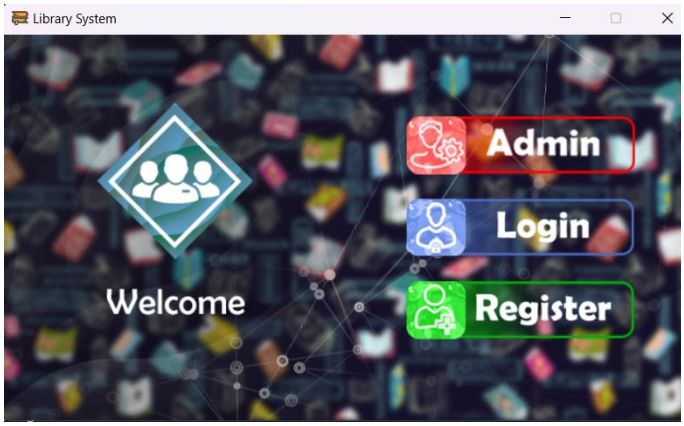

Figure 2: Modes Page

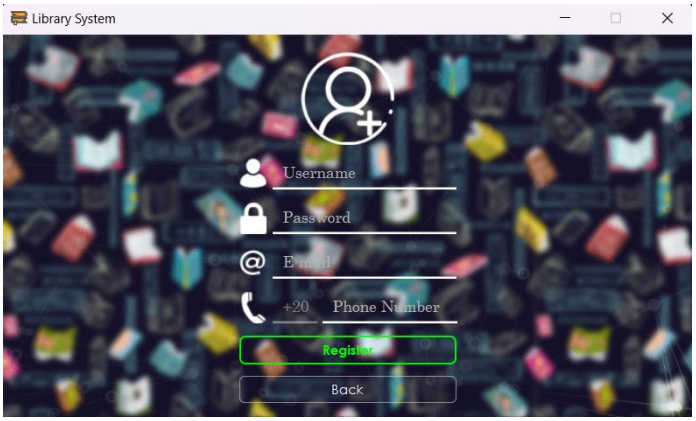

Figure 3: Register Page

Upon successfully completing the registration process, the user gains the ability to access the system by logging in using the Login option depicted in Figure 2. Subsequently, the login form in Figure 4 is presented to the user. In the event that the user forgets their password, a feature has been implemented to address this scenario. Figure 5 presents a dashboard that encapsulates essential features available to the user upon logging in, including borrowing available books, returning borrowed books, and browsing the library's assortment to choose books for borrowing. Additionally, users can view their own profiles, registered information, and activity within the application.

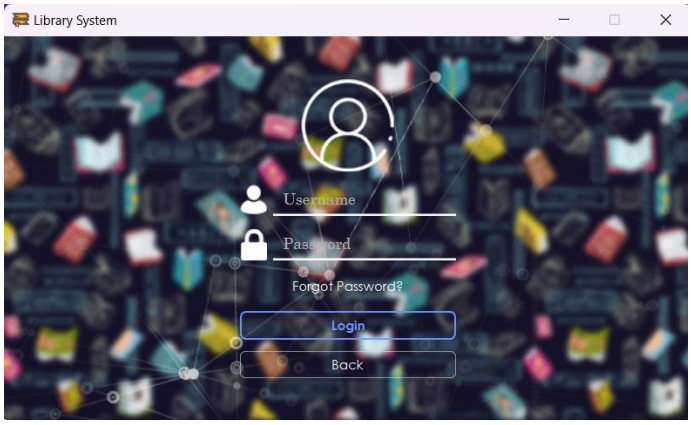

Figure 4: User Login

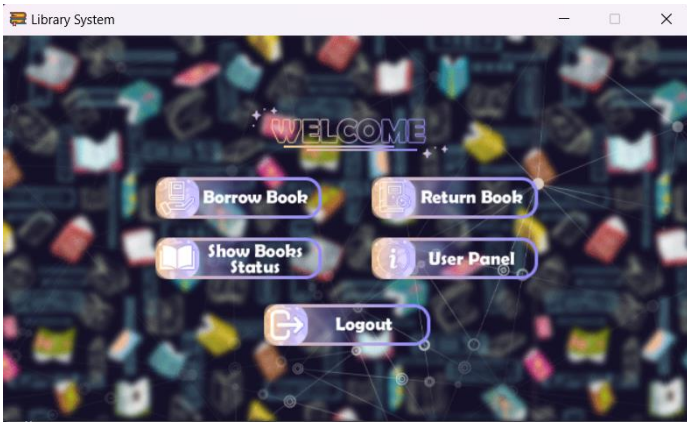

Figure 5: User Dashboard

The application includes a moderator account that allows administrators to update the system with necessary changes. To access these accounts, administrators should utilize the admin login option in Figure 2. As depicted in Figure 6, administrators must enter their provided username and password to log in and access the features of the moderator account.

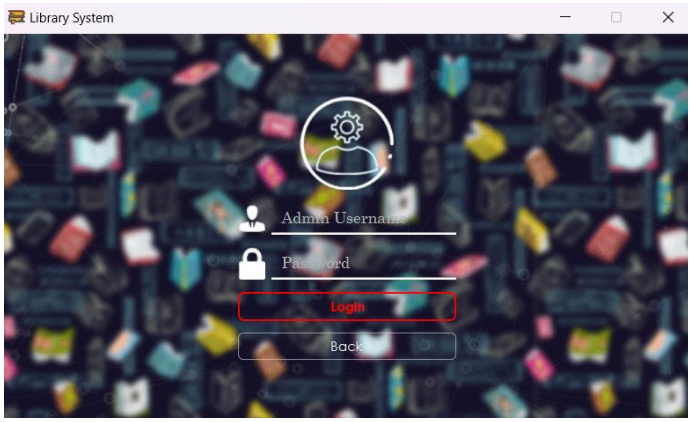

Figure 6: Admin Login

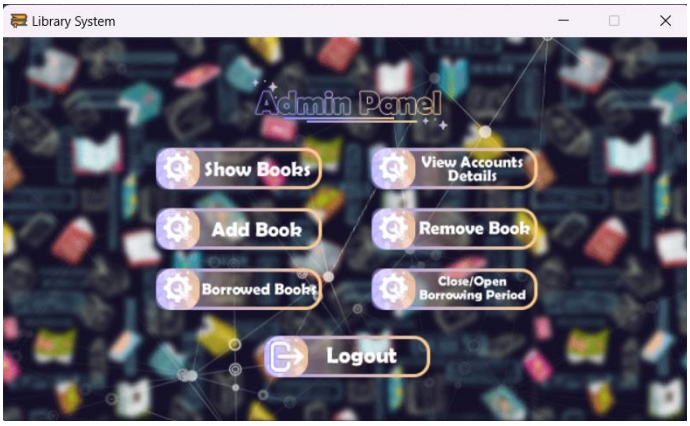

Figure 7: Admin Panel

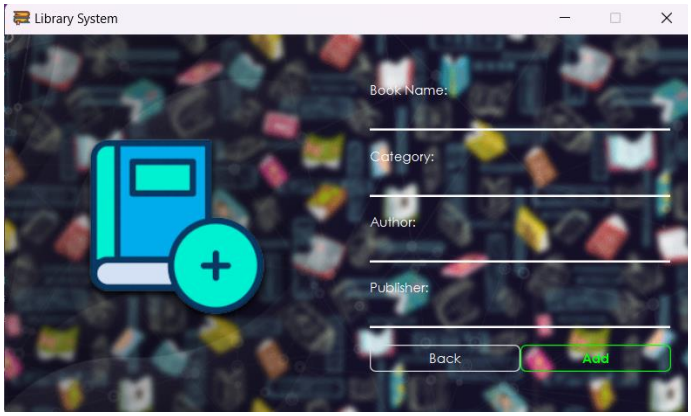

Figure 8: Add Book Feature (Admin)

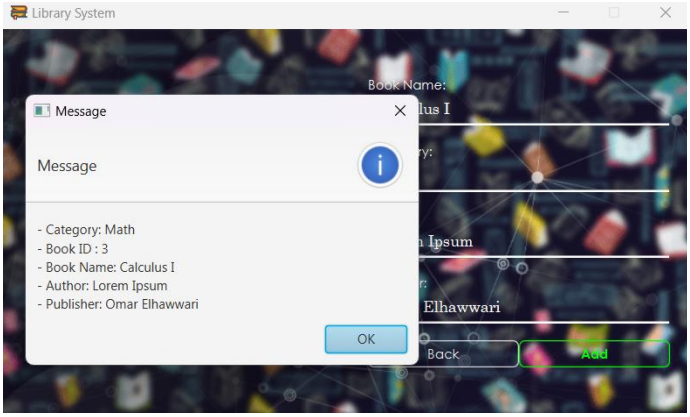

Figure 9: Book Added (Admin)

Upon successful admin login, a dashboard will be displayed, encompassing primary functions for the library system. These functions include adding books to the library, illustrated in Figures 8 and 9, removing books from the library as shown in Figure 10, displaying the current books in the library as depicted in Figure 11, showcasing currently borrowed books from the library (currently under construction), and presenting information of registered users as seen in Figure 12.

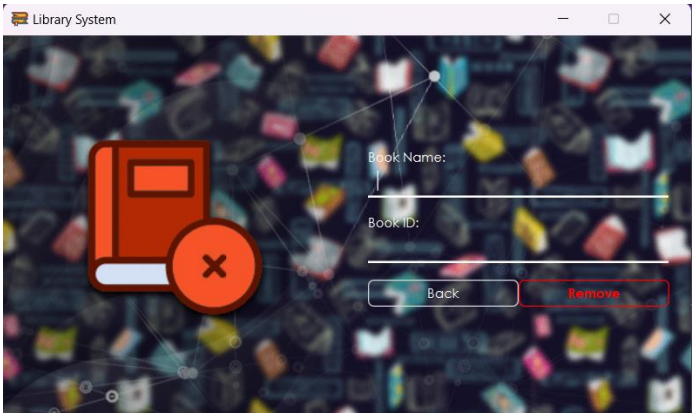

Figure 10: Remove Book Feature (Admin)

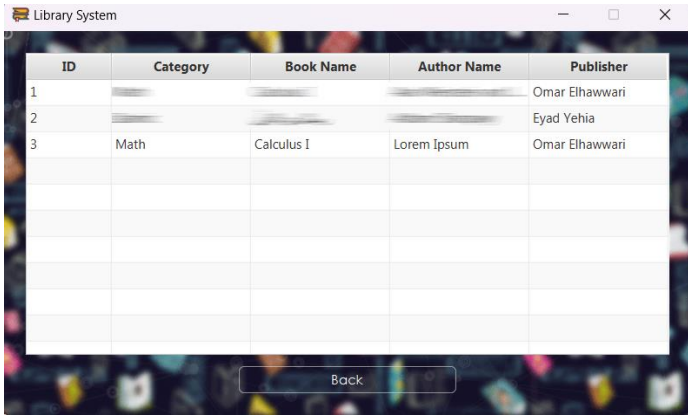

Figure 11: Show Books Feature (Admin)

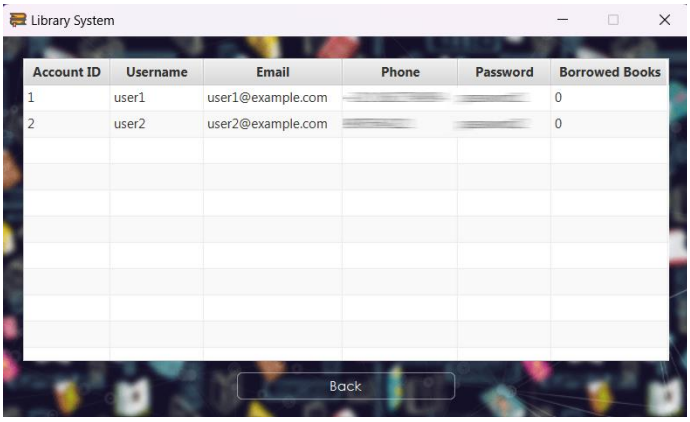

Figure 12: Show Accounts Feature (Admin)

In Figure 9, a book was successfully added to the library after entering the necessary information into the system, and the added book is displayed in Figure 11.

The admin has the capability to disable the borrowing option from the library if necessary, as illustrated in Figures 13 to 16. This feature can be valuable when all the books in the library are currently on loan.

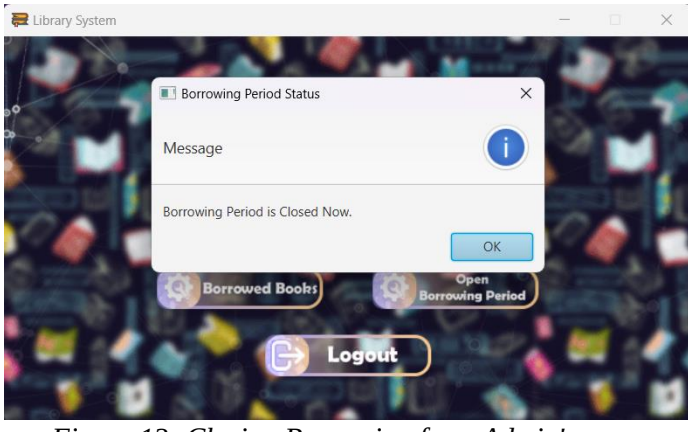

Figure 13: Closing Borrowing from Admin's pov

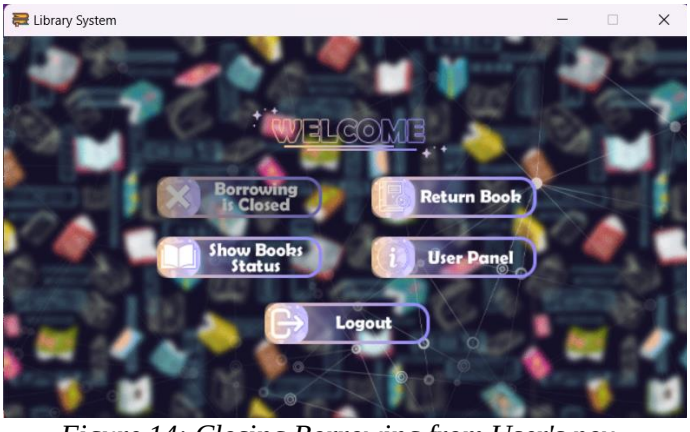

Figure 14: Closing Borrowing from User's pov

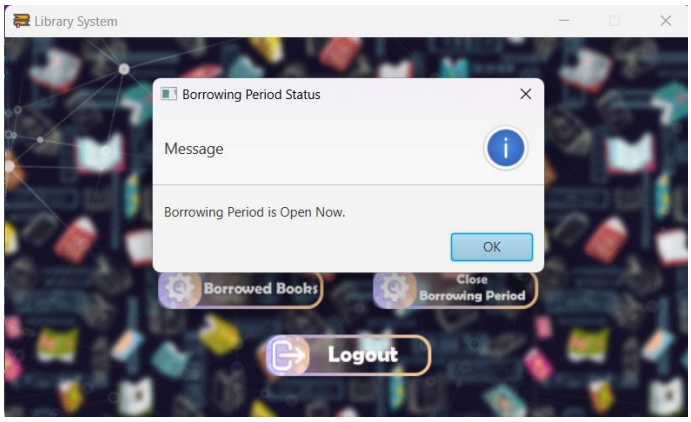

Figure 15: Open Borrowing from Admin's pov

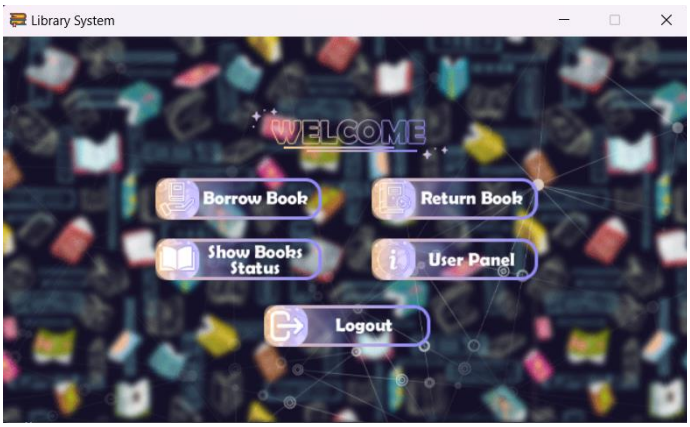

Figure 16: Closing Borrowing from User's pov

Additional features have been incorporated into the system; however, as for the timeline, it is still in the process of being developed and will be added soon.

5.2. Software Interface

The library system application is a Java-based application developed using Visual Studio Code, Photoshop, incorporating various packages and libraries. The application is designed to display datasets and facilitate interactions between users and the server/database, managing Outing data sent from the app and handling Incoming data received from the server and database.

5.3. Hardware Interface

An essential aspect is that the app needs an internet connection to operate seamlessly with the database.