Chapter 1: Introduction

1.1 Introduction

There is an interactive software of library management system for a community library. In this software a user can login and add the book from library which he don't require play his part for community and then user or may be library person can remove book which are not that much good in condition and remove them from library management system. User can select the book from library and see only which book they selected. In the same way they can return the book.

1.2 Objectives

- To develop a user-friendly system representing a library management system that the specific users can select book and return book.
- To allow for multiple users within the same application using the signup-login functionality.
- To allow users add book, remove book from library as it is a community library.

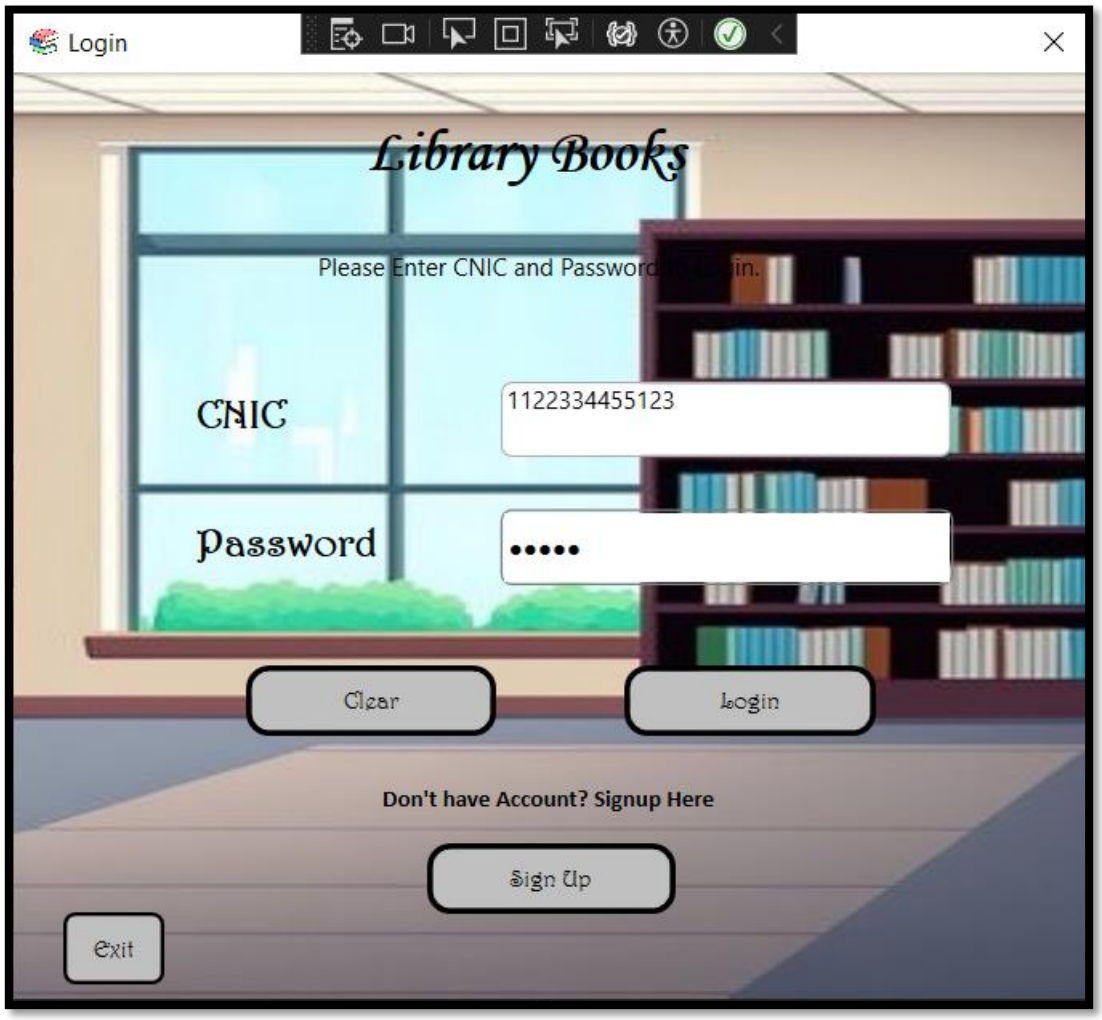
1.3 Requirements

1. Login functionality
2. Signup functionality
3. Screen to see the book in Library
4. Search the book with title
5. Select the Book
6. Specific user see their selected book
7. Return the book to the library
8. Remove the book from library
9. Good GUI design
10. Usage of Data grid

Chapter 2: Requirements Analysis and Fulfillment

2.1 Login Functionality

We must provide login capability in our application. We may accomplish this by first connecting to the database and adding required checks and measures to ensure that the accounts are correctly validated before returning a successful or unsuccessful login result.

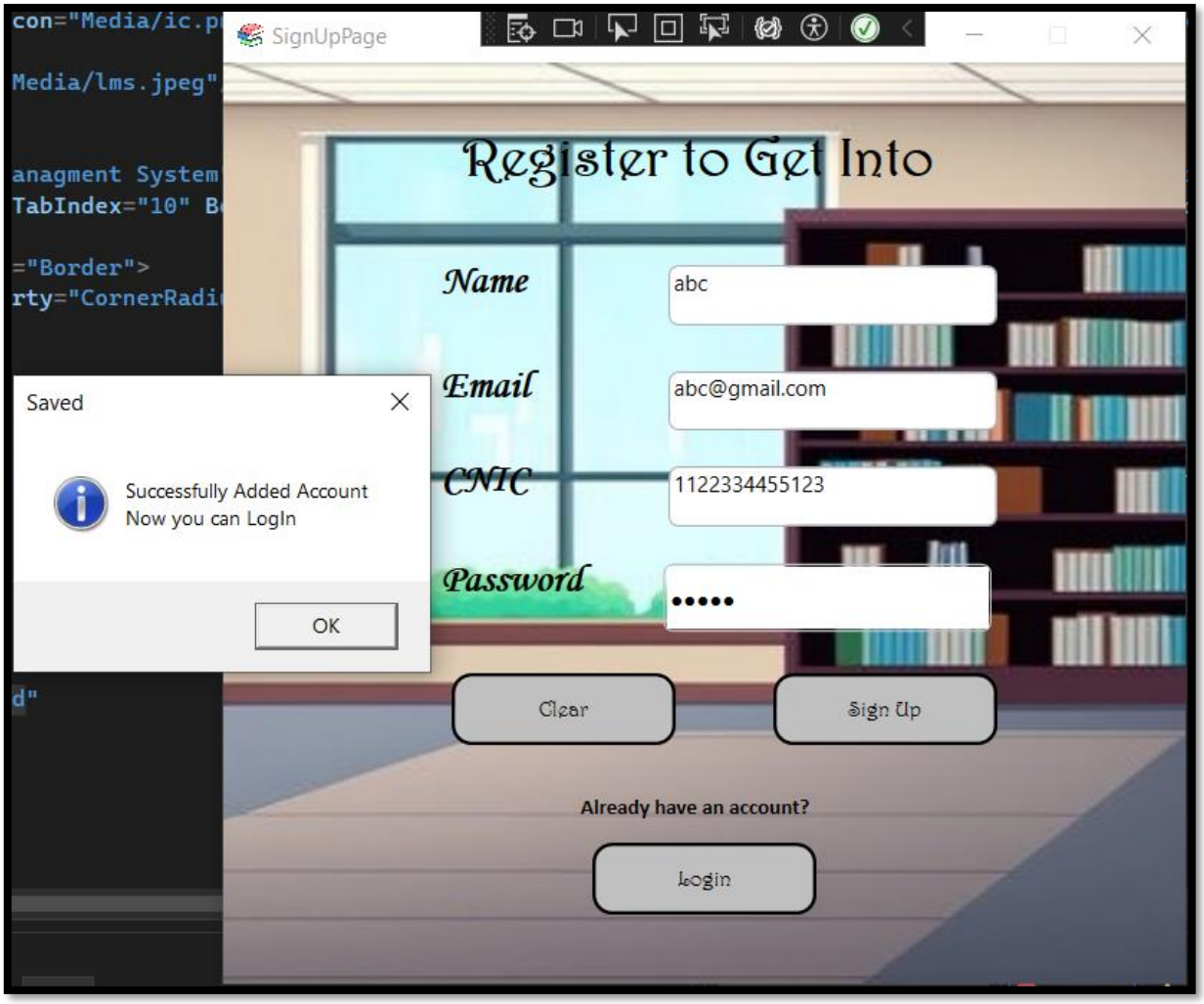


This condition is met, as shown in the screenshot above. Our application now includes login capabilities.

This report is accompanied with the source code for this window.

2.2 Signup Functionality

We must include a signup mechanism in our application. We may accomplish this by connecting to the database in the same way. Then, using a query, we insert the new account's credentials into the database. We also added a check to prevent any accounts with the same email from being created, avoiding duplicate accounts from being created.

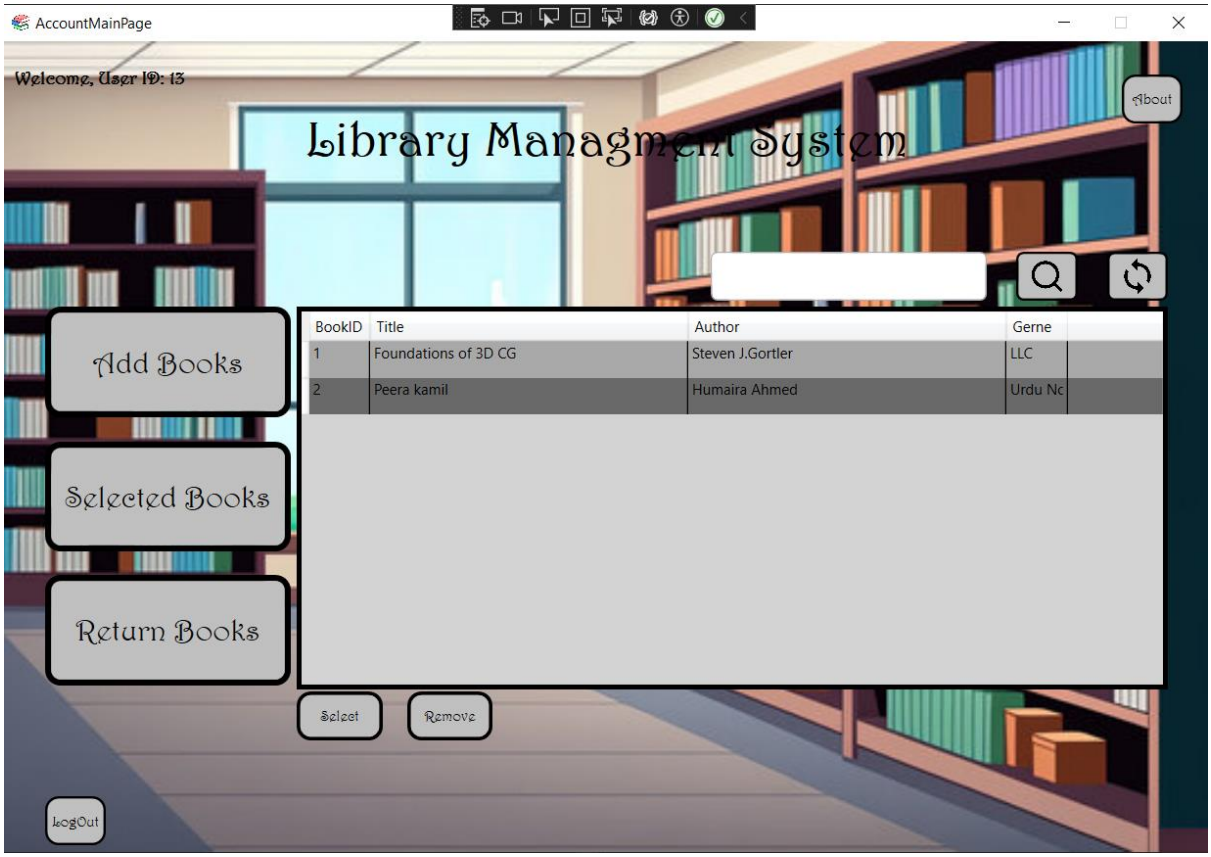


This condition is met, as shown in the screenshot above. Our application now includes login capabilities.

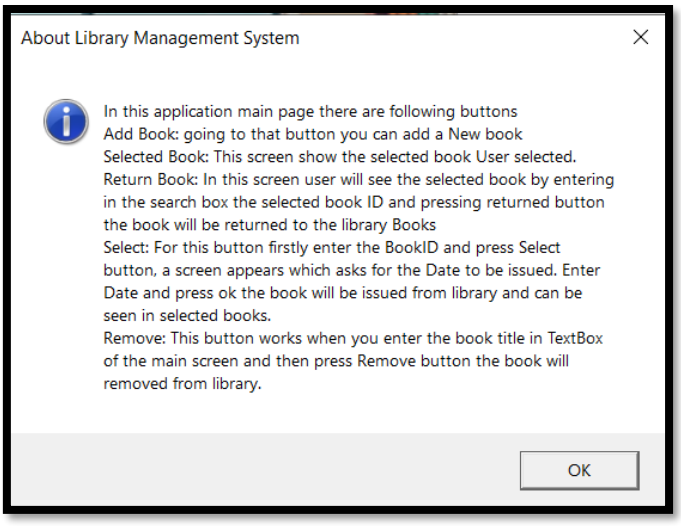
This report is accompanied with the source code for this window.

2.3 Main Window and access to do any Action for performing Library management operations:

Next, we have the requirement to search, add, remove, select and return the book. This screen contains three main buttons that moves the control to other screen. These buttons are **"Add Books**", "**Selected Books**", "**Return Books**" the explanation of these button screen will be provided below.

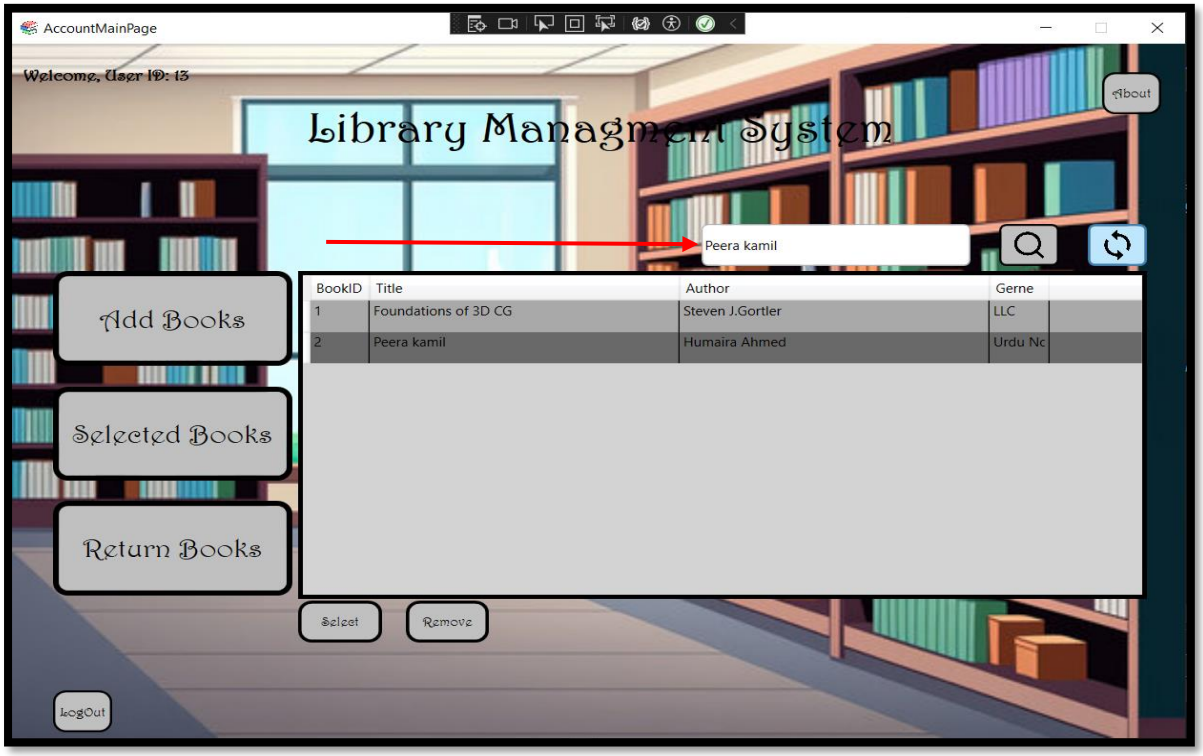


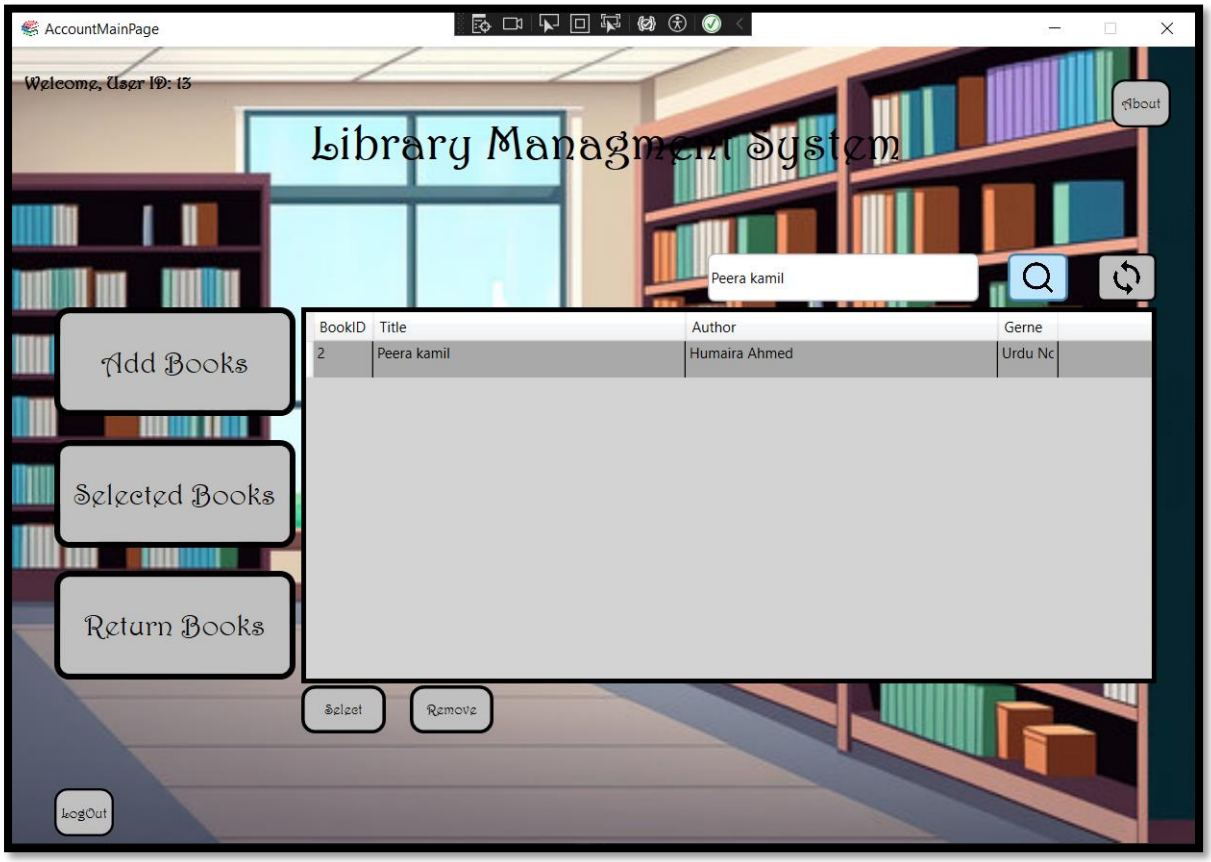
The other button on this screen includes "**About**" button on the top right corner of screen that contain all the information of all the buttons on the screen in a message box as below:



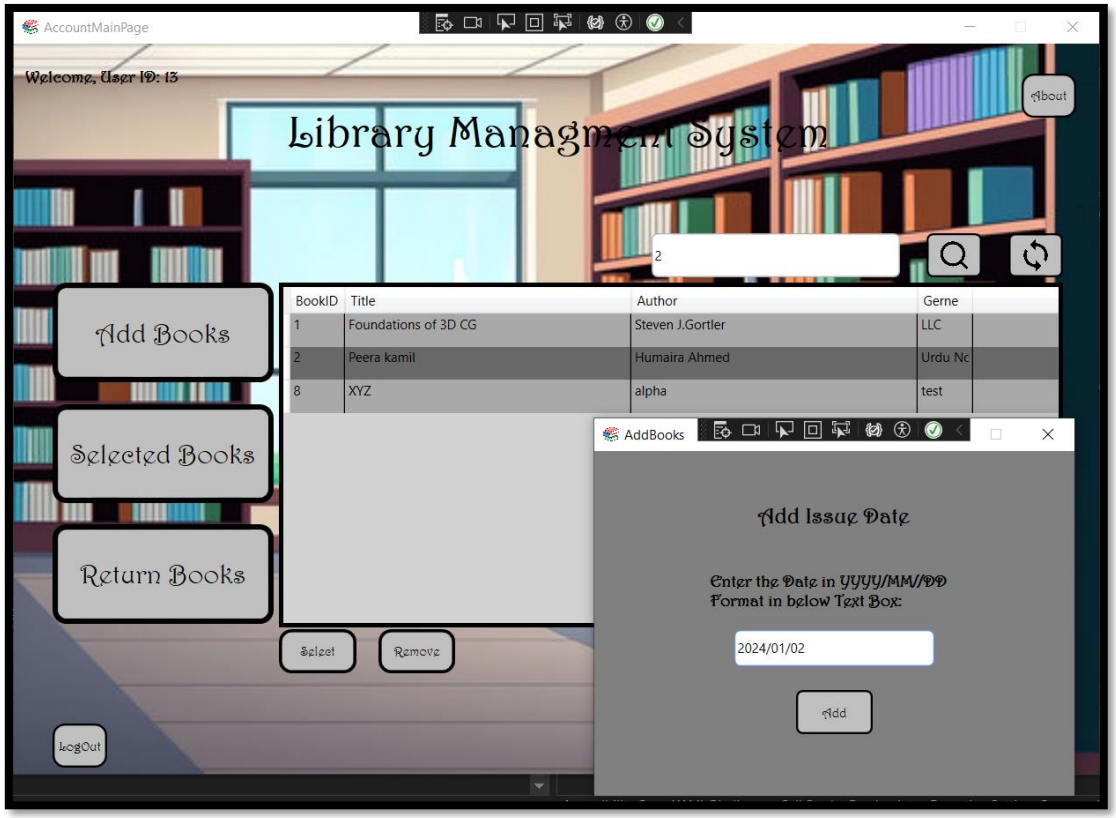
In top left corner a text shows that which userID is logged in.

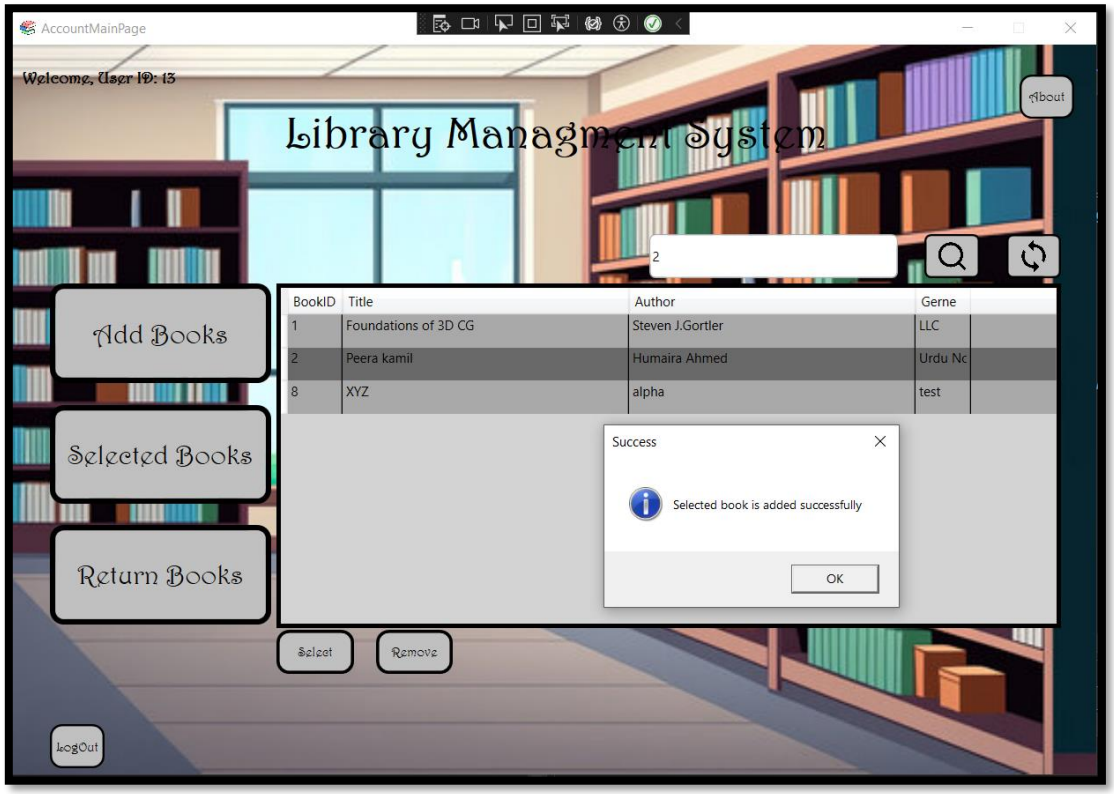
There is a search button works when user enters title of the book on the screen and press enter like in the 2 screen shots below:

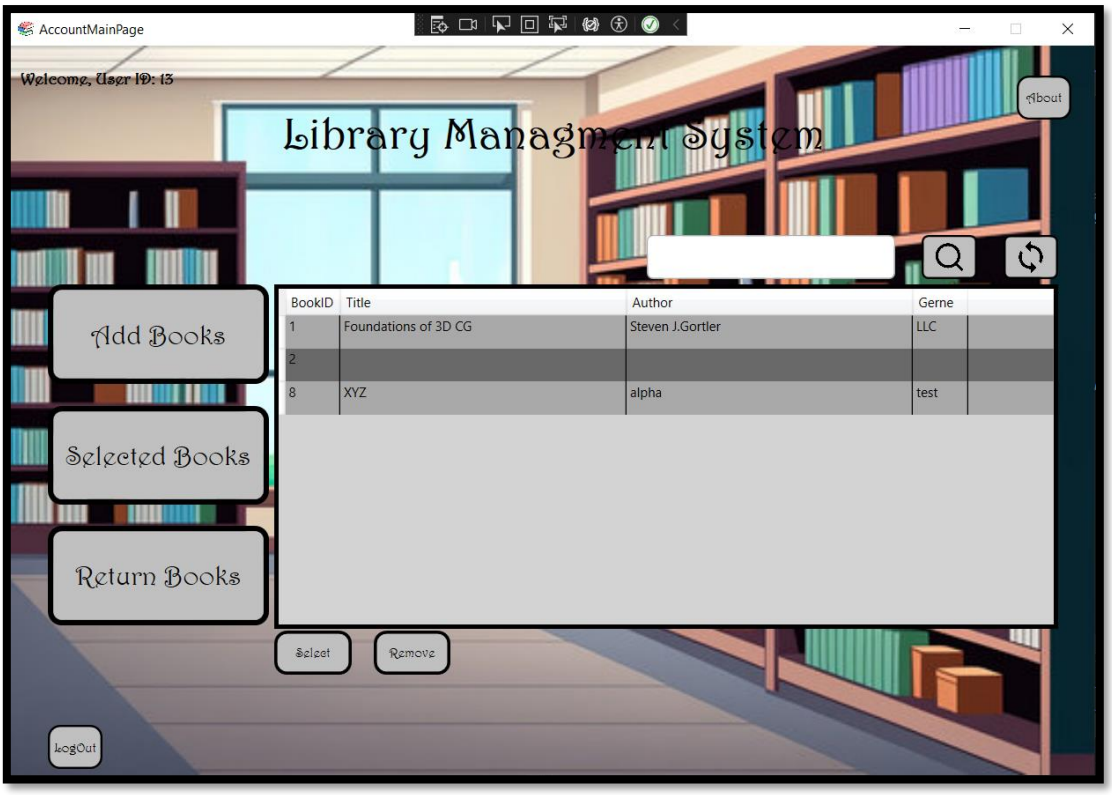




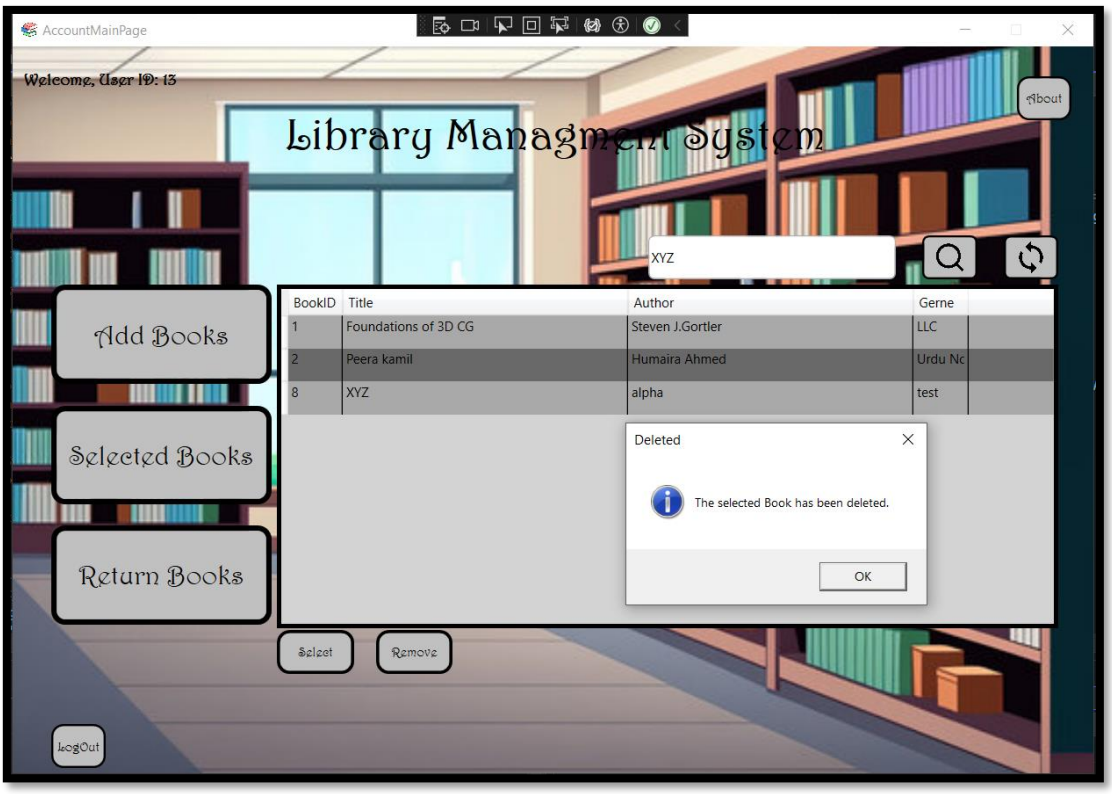
Next to reload button which reloads the Data grid. Then there is the "**Select**" button below right of the data grid. It works if the user enter book ID the and the press the select button another screen appears in which date on which the book is issued is entered and book goes to selected book in database. The screen shots of these steps are as:

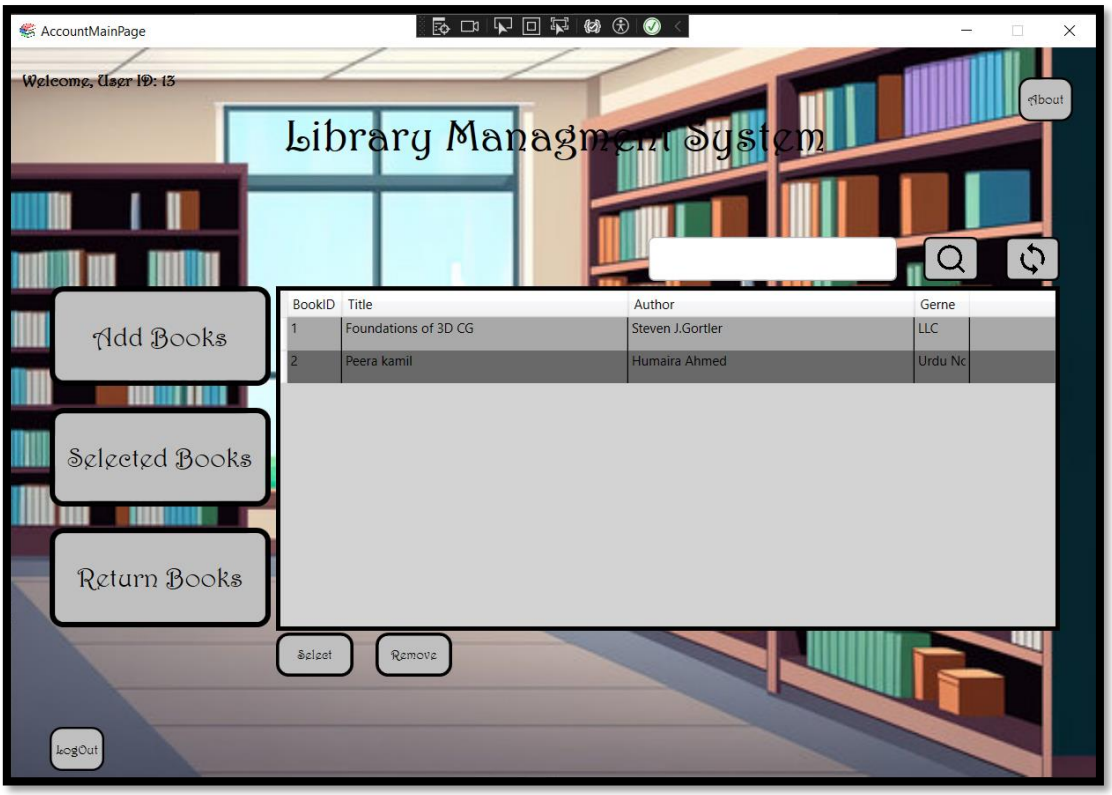






Nest to select button there is a "**Remove**" button which works if the user enters the book title and then press the remove button all the record related that book title in search box is deleted. The steps are as follows:



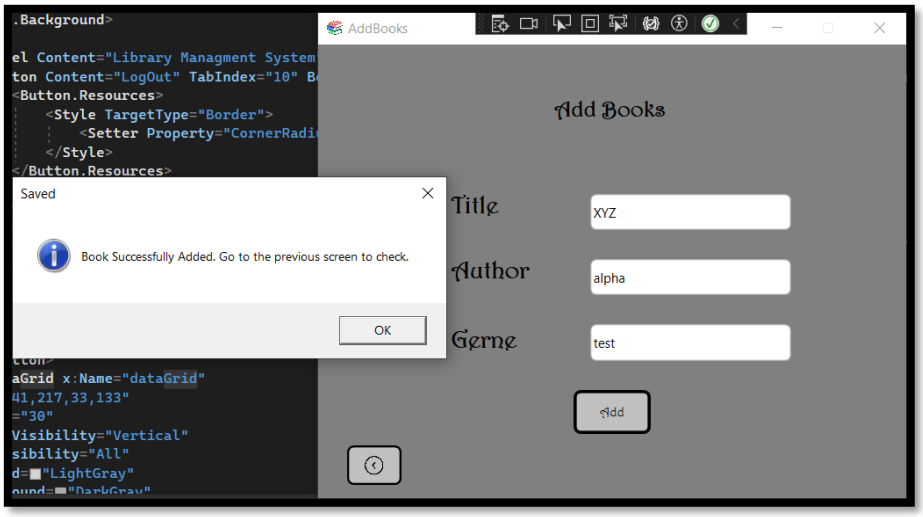


In the bottom left corner there is a "**logout**" button from which user can log out.

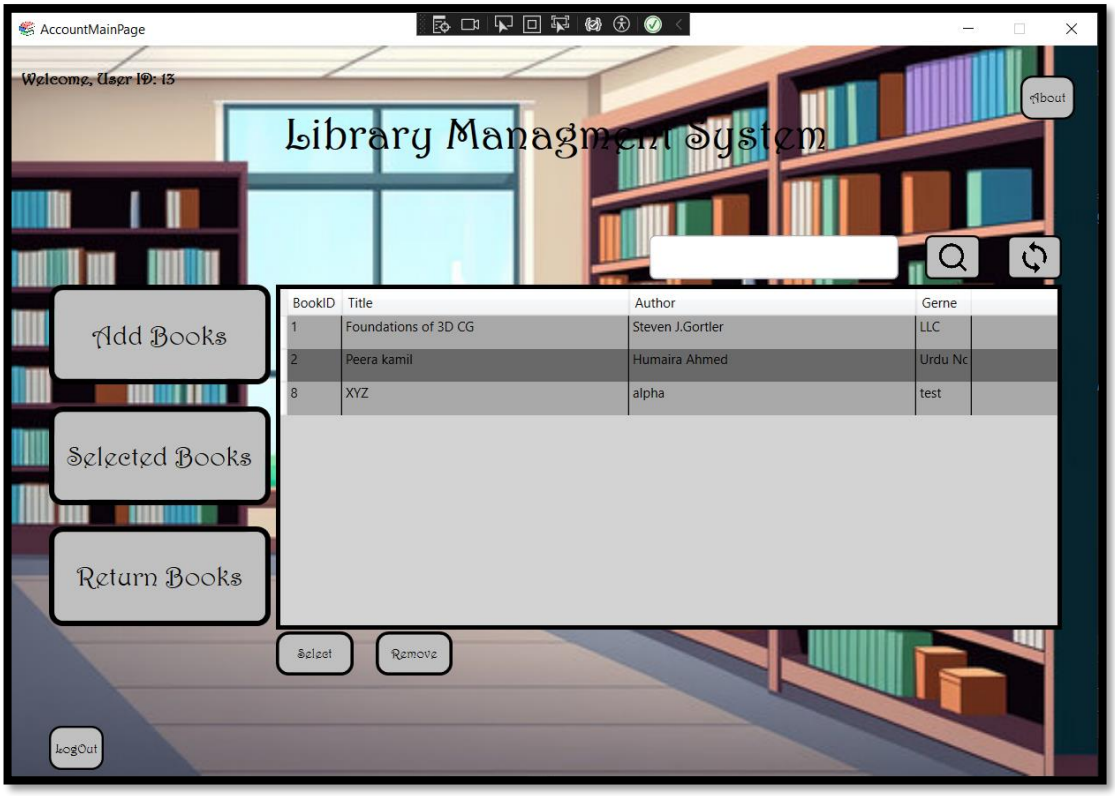
The source code for this window is included along with this report.

2.4 Add Book Window

Next, we have the Add Books. In this window, we have the option to add new Books those were added to the library. There is proper validation in place to prevent users from entering irrelevant information or leaving the textboxes empty. The screenshot is listed below.



The newly added book can be seen on the Main Screen as:

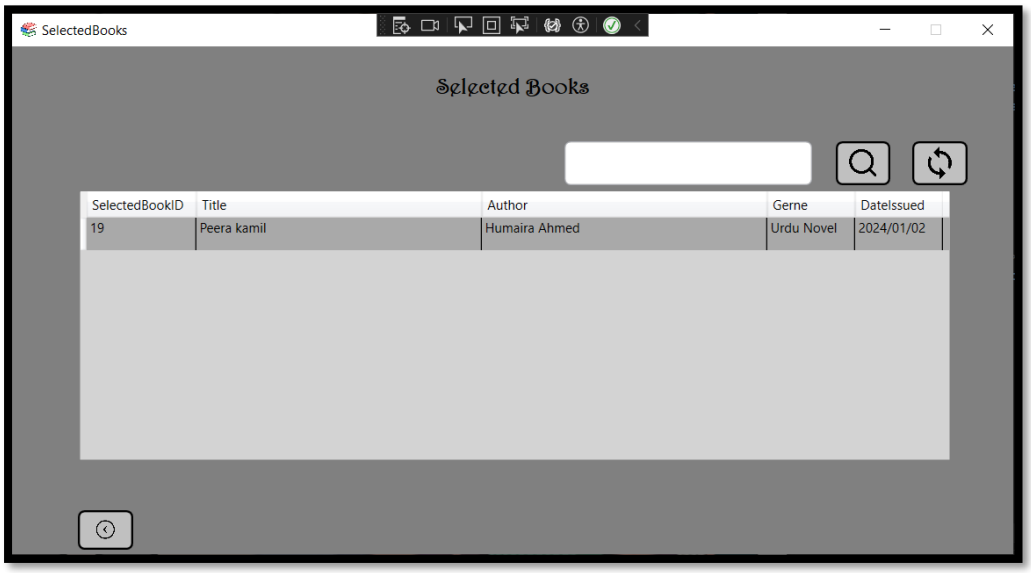


The source code for this window is included along with this report.

2.5 Selected Books Window

In the selected books window user see which books he selected form the library

And this is specific to the user. You can also search the books in the selected books using title of the book. Each user can see only his selected books as:

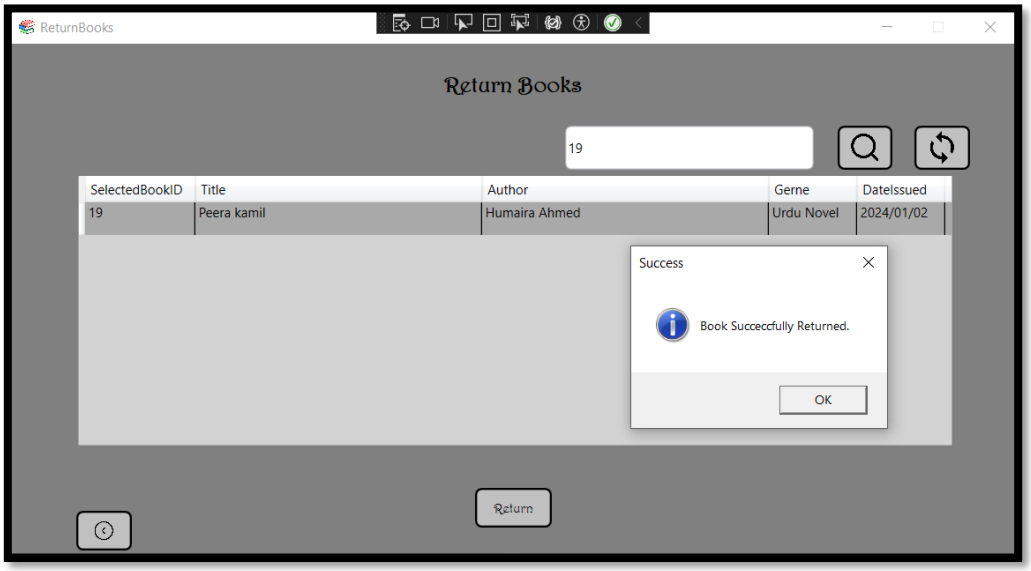


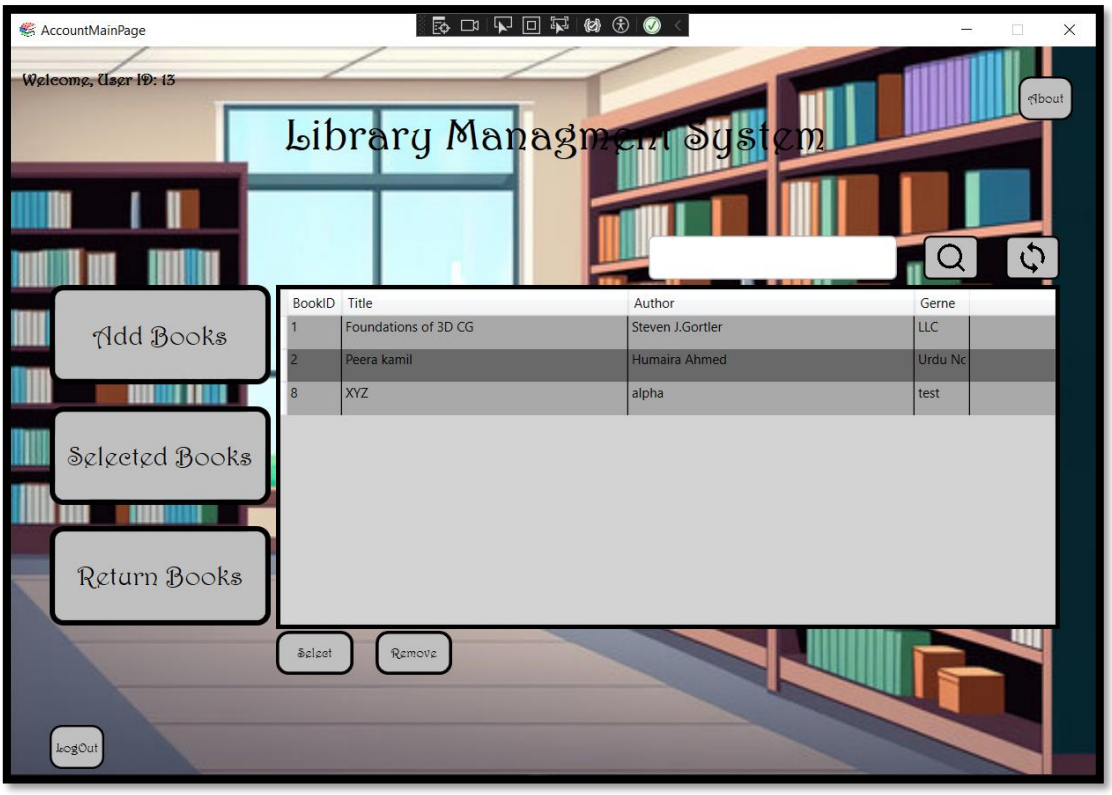
The source code of this window is included along with this report.

2.6 Return Book Window

In this window there is also a selected book table you will see in the Data Grid specific to user logged in, and here also you can search the book on the basis of book Title. But the difference is that you can also return the book in this screen by entering the selected book ID from data grid into to the text box and pressing "**Return**" button the book will be deleted form detected book table and moved to the library book table at main window as:

The source code of this window is included along with this report.

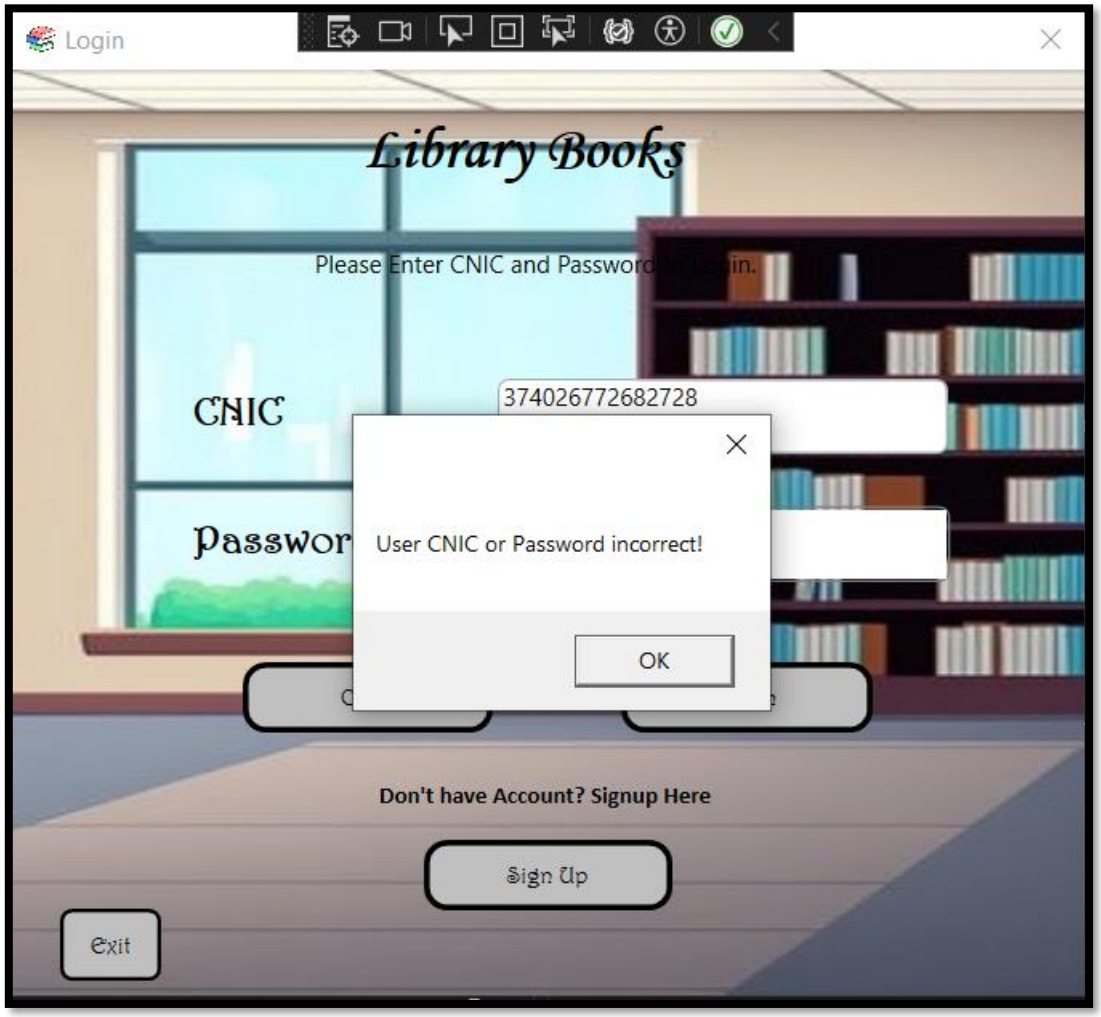



AccountMainPage
Welcome, User ID: 13
Library Managment System
About
Add Books
Selected Books
Return Books
BookID
Title
Author
Gerne
1
Foundations of 3D CG
Steven J.Gortler
LLC
2
Peera kamil
Humaira Ahmed
Urdu Nc
8
XYZ
alpha
test
Select
Remove
LogOut

Chapter 3: Exception Handling and Robustness

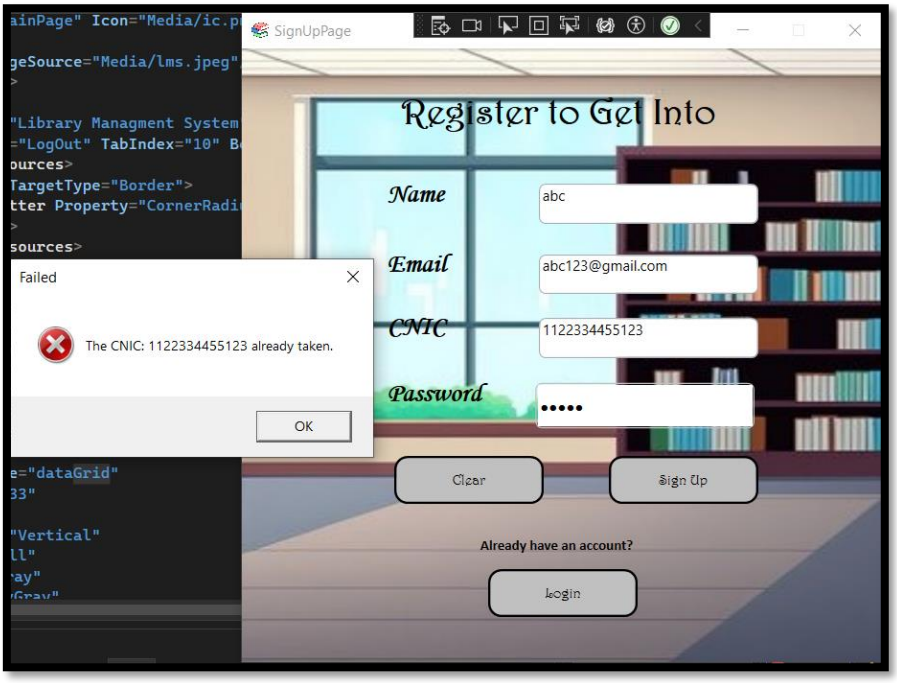
3.1 Login Validation

We can see in the above screenshot that if the user enters incorrect credentials, an error is shown and the user in unable to login successfully.

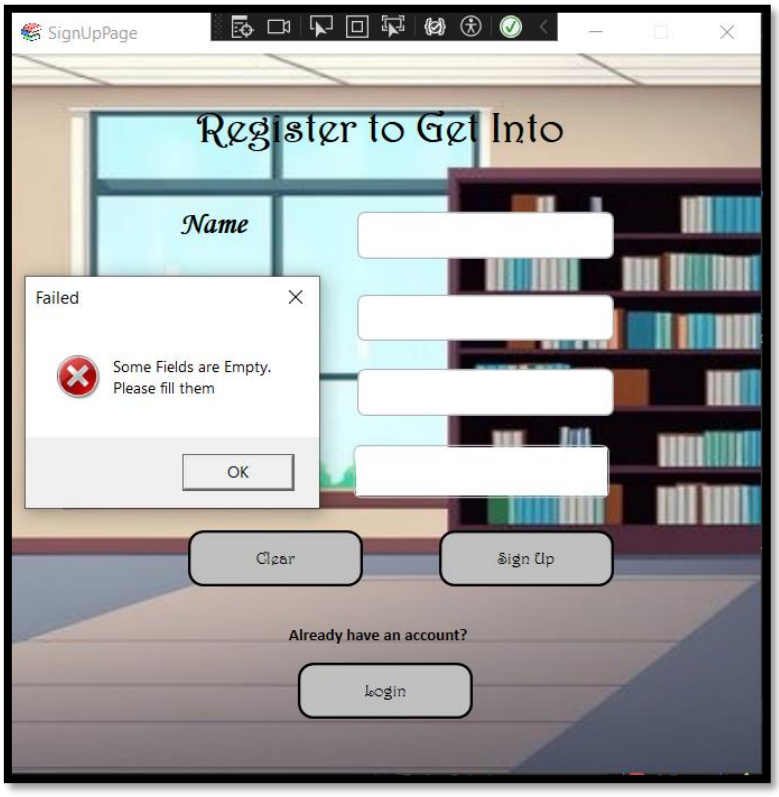


3.2 Signup Account Uniqueness and Field left empty exception

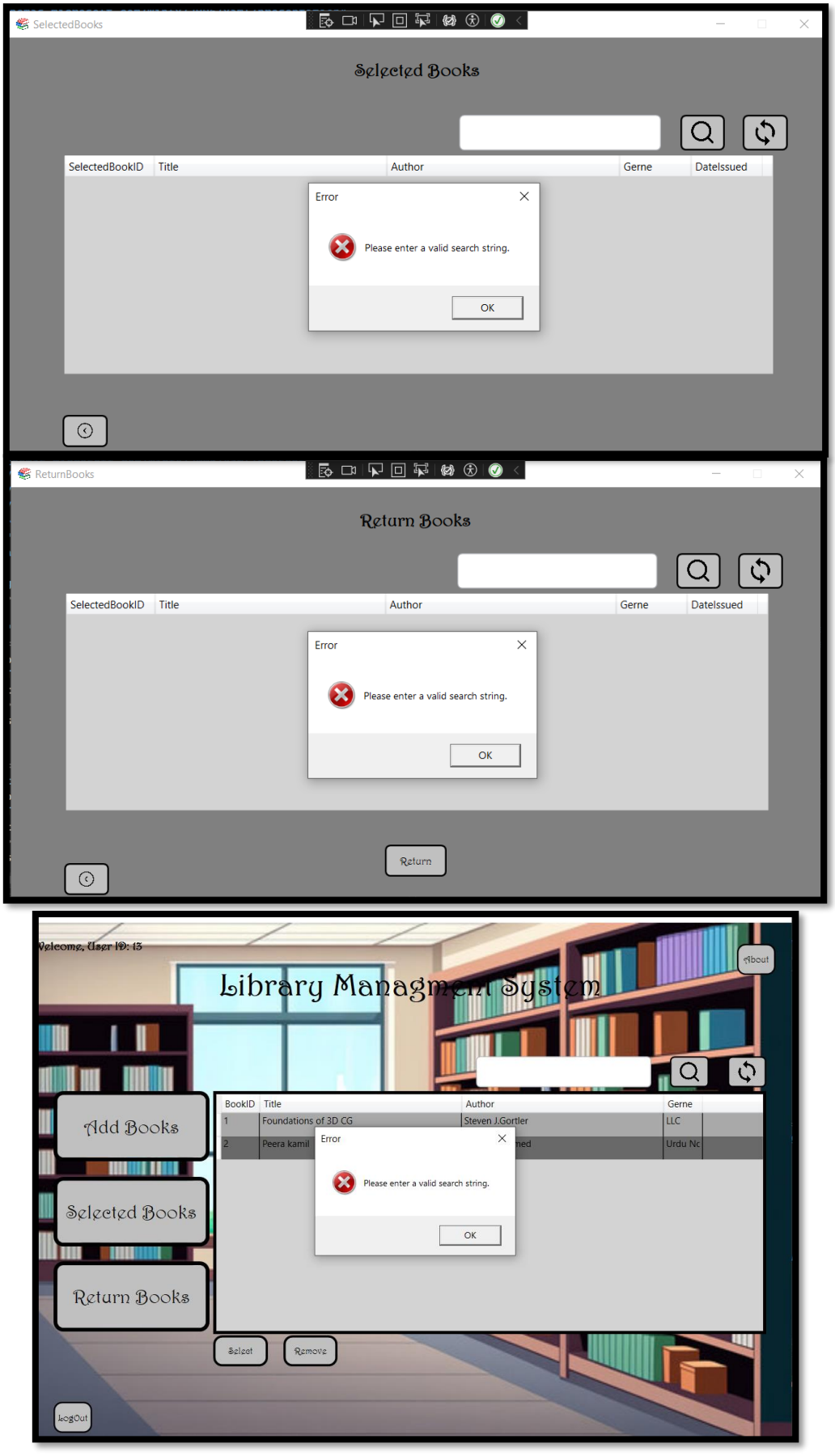
We can see in the above screenshot that if the user enters an email that is already in use, then an error is shown and the account is not made.



There is another exception handling functionality, that is when the text boxes are left empty or entered only whitespaces and signup button is pressed the error mentioned below is generated:



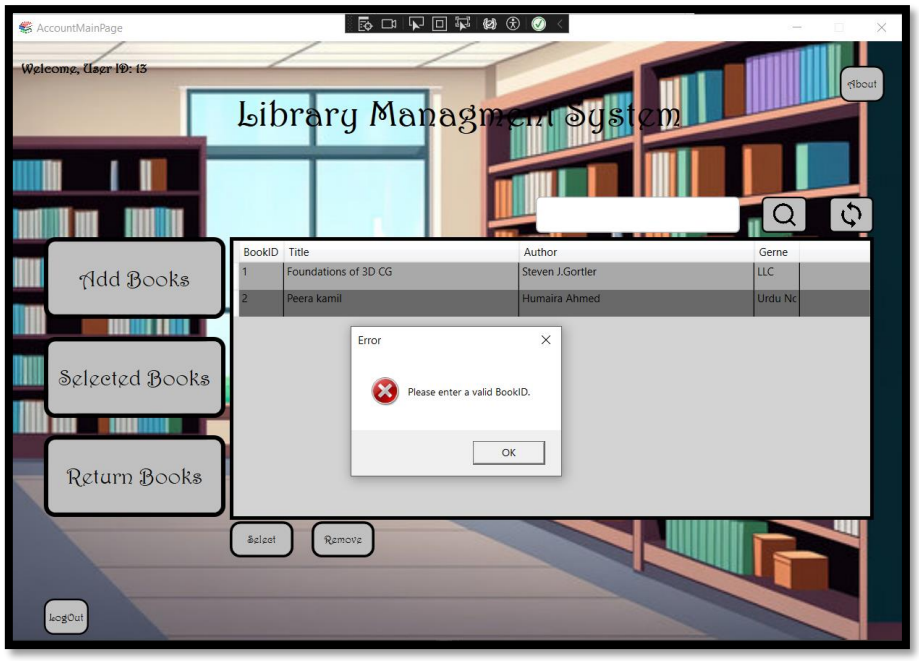
3.3 Incorrect Search String



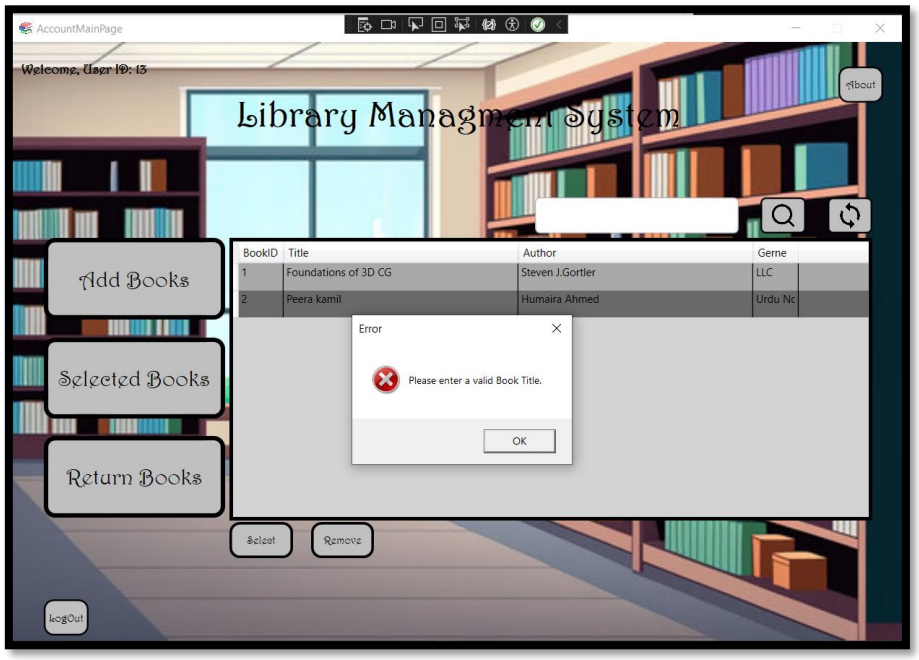
This exception is handled when the user enters the incorrect name of the task in the search box which is then used to either delete the task or mark it as completed, so this exception is handled in any of those functionalities. The same exception is also handled in home tasks window as well.

3.4 Incorrect data for Select, Remove buttons in Text box

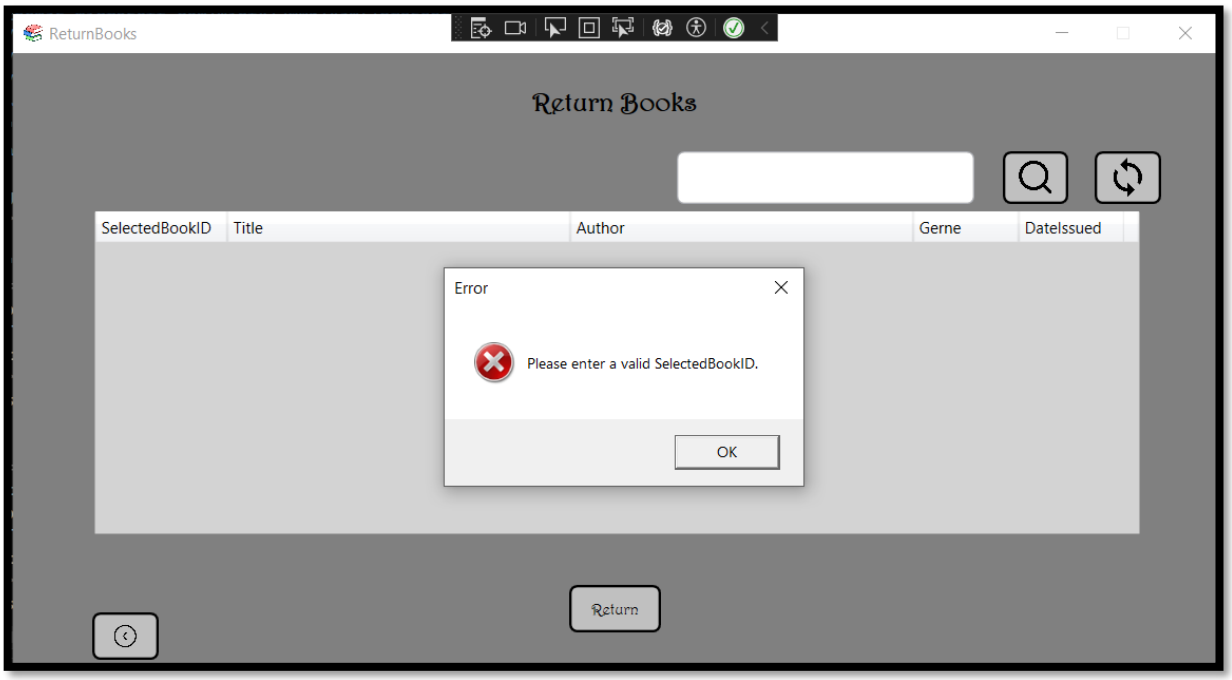
If anything else or incorrect Book ID is entered and "**Select**" button is pressed this error pops up:



If any other value or text is entered in textbox the title value and "**Remove**" button is pressed then this error pops up:



3.5 Incorrect data for Return buttons in Text box



If any other value or text is entered in textbox the title value and "**Remove**" button is pressed then this error pops up:

Chapter 4: Database Design

4.1 Database Design

There are a total of 3 tables in our database.

- *User_Info Table*

  Contains the account credentials data for all users.

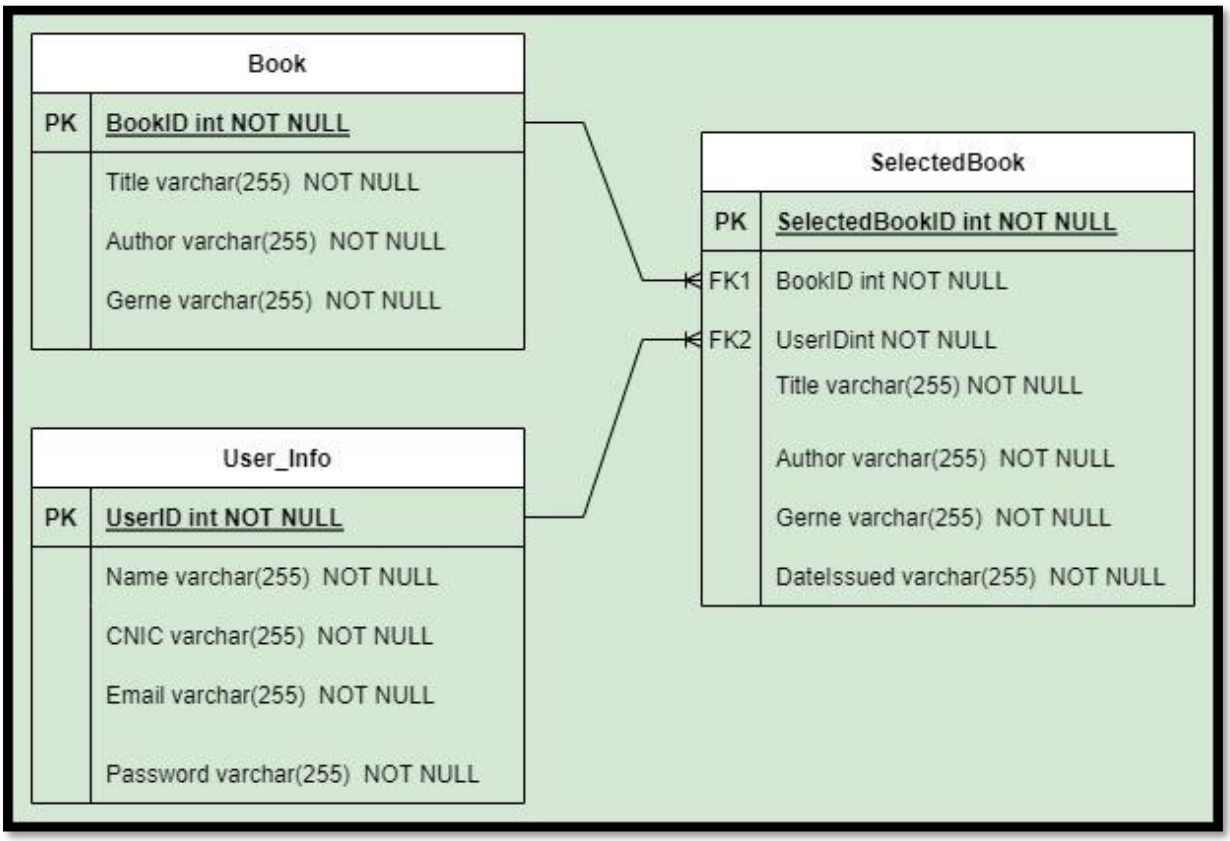
- *Book Table*

  Contains the details of all the library books.

- *SelectedBook Table*

  Contains the selected book details for all users.

4.2 ERD Diagram



4.3 Relationships

There are a total of 4 tables in our database.

- *User_Info - SelectedBook Relationship*

  Each user will have multiple books selected from library, so it is a one-to-many relationship.

- *Book - SelectedBook Relationship*

  Each Book form library will be selected multiple times from library, so it is a one-to-many relationship.

4.4 Database Table Images:

User_Info Table:

Column Name	Data Type	Allow Nulls
UserID	int	☐
Name	varchar(255)	☐
CNIC	varchar(255)	☐
Email	varchar(255)	☐
Password	varchar(MAX)	☐

Book Table:

Column Name	Data Type	Allow Nulls
BookID	int	☐
Title	varchar(256)	☐
Author	varchar(256)	☐
Gerne	varchar(100)	☐

SelectedBook Table:

Column Name	Data Type	Allow Nulls
SelectedBookID	int	☐
UserID	int	☐
BookID	int	☐
Title	varchar(256)	☐
Author	varchar(256)	☐
Gerne	varchar(100)	☐
DateIssued	varchar(50)	☐

Chapter 5: Conclusion

5.1 Lessons Learned

- I learnt how to create a login capability in a WPF application, as well as how to create new accounts and a signup functionality.
- I learnt how to read and write data from and into databases, with SQL being our preferred database.
- I learned how to isolate data for multiple users by using the UserID and the one=to-many relationship between the users table and the related other table. By doing so, all other users' tasks are concealed from them, and they can only view their own.
- I've learned how to use exception handling properly to account for and handle any form of irregularity that our application may encounter.
- Overall, completing this project has provided me with great experience in working with databases and connecting them to applications. It has also provided me with important experience in designing graphical user interfaces.

5.2 Project Summary

- I am the creator of the Library Management System project. This project was created using the WPF framework and.NET.
- This project is a comprehensive application that fulfils the job of jotting down and tracking tasks that the users must complete.
- You have the option of creating new accounts or logging into existing ones.
- Users can enter tasks into two main categories: Select Book, Remove Books, and Return Book.
- Users can add more tasks, search books, and reload the Dara Grid Button.
- Exception handling is carried out efficiently to account for any unusual scenarios that may emerge. This has resulted in a relatively robust program that can fulfil its intended role admirably.

THE END