



TIS 2151
WEB APPLICATION DEVELOPMENT

Assignment
Tutorial Session: TT2L
Lecturer: Khairil Imran Bin Ghauth

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INTRODUCTION

Project Overview

For this project, we were tasked by our lecturer Mr. Khairil Imran Bin Ghauth to brainstorm a web application and subsequently implement it using the knowledge and skills that we have learnt throughout this subject to implement this system. We have come out with a project which helps manage a library called a library management system. For the Client-side scripting, we will be using HTML, CSS and JavaScript. While implementing the Server-side scripting, we will be using PHP. For managing the database, we will be using MySQL using queries such as insert, select, update and delete.

We will have 2 types of people that will be using our system, which are the 'Users' and also the "Admins". The 'Users' will be able to login to the system using their credentials and they are able to see a list of books that are available for borrowing, the books' information will also be visible to them. While the 'Admins' are able to create new 'Users', add new books to the database and also change the status of the books. For example if a book is damaged or in repair, the admin can manually change the books' status to 'Unavailable' to prevent the 'Users' from being able to borrow it.

Problem Statement

With the current pandemic going on, libraries tend to be more difficult and inconvenient to visit in person. An improved online system can help the general public to check the book they want to borrow in advance without having to spend too much time out in the library. It will significantly reduce the risk of someone contracting or spreading COVID-19. This system will surely play an important role in curbing the spread of COVID-19 in our country while increasing the efficiency of a library's management process.

Objective

In order to successfully implement this library management system, we have come up with three main objectives that we will to achieve in order to steer our development in the right direction. These objectives include:

- To increase convenience for library users to check for books they want to borrow
- To keep up with the increasing demand for online library systems as physical search for books are hard during the pandemic
- To keep track of the user's late fees remotely

Scope

This project involves building a library management system for the use of 2 types of roles, namely the 'Admin' and 'User'. Some functions for the 'Admin' include:

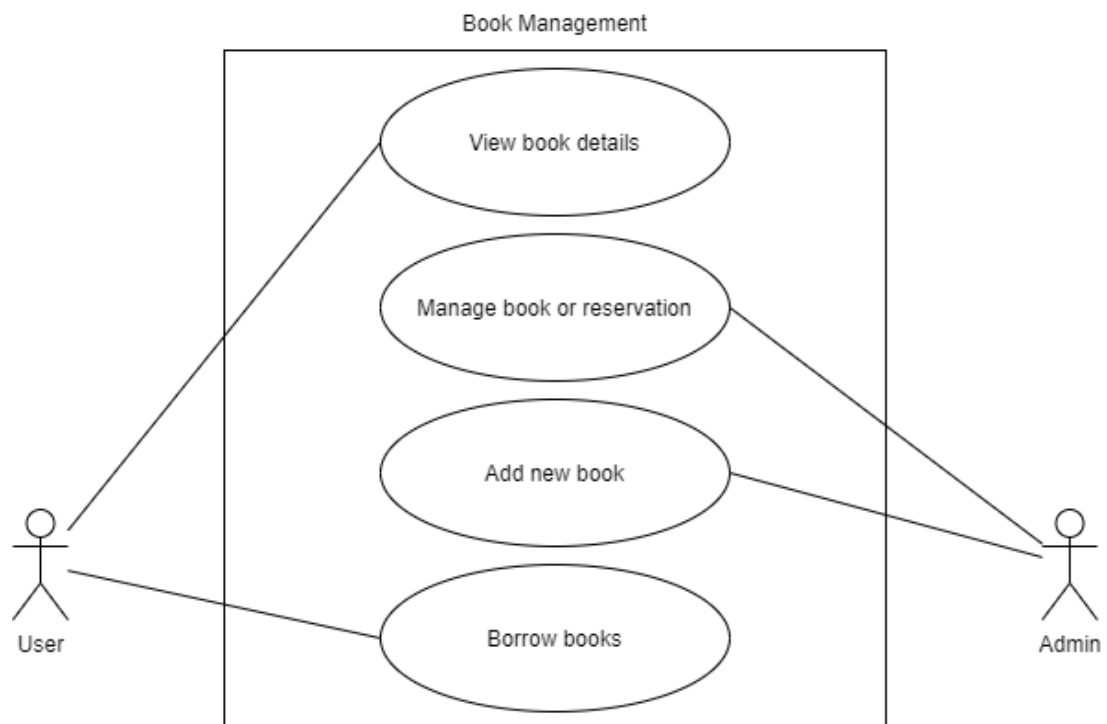
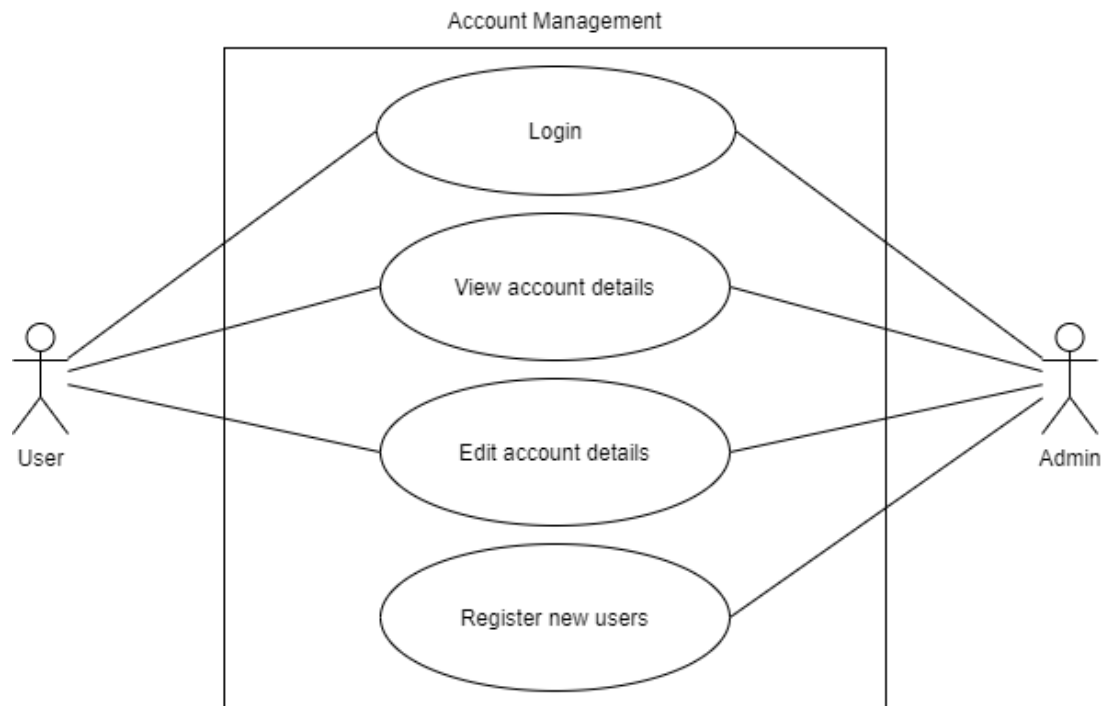
- Able to add new books into the library's book database.
- Able to edit the status of the books.
- Able to register new users.

On the other hand, some functions for the 'User' includes:

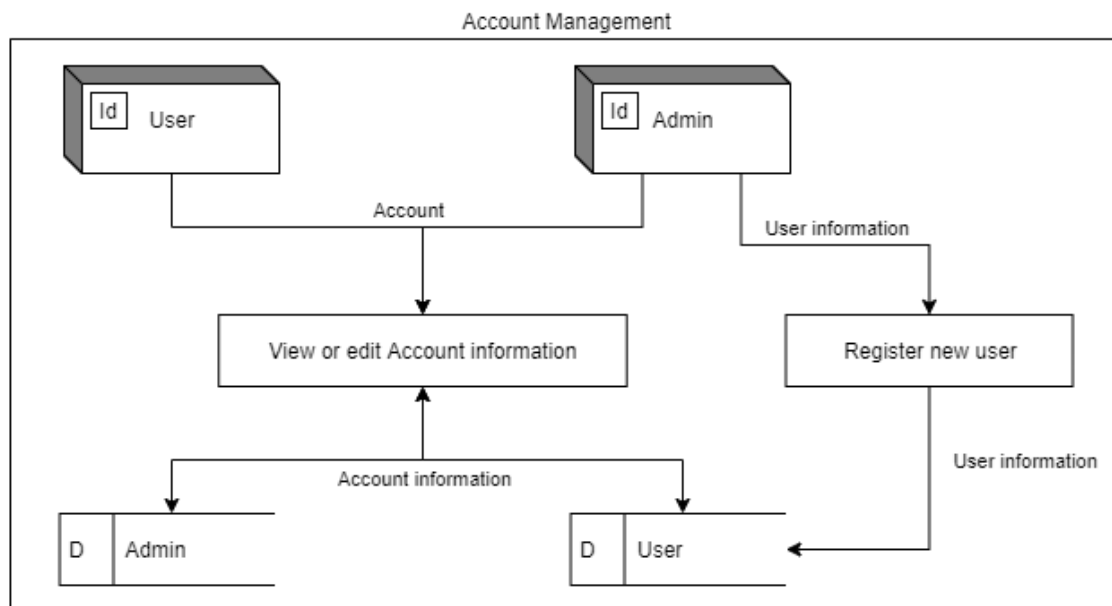
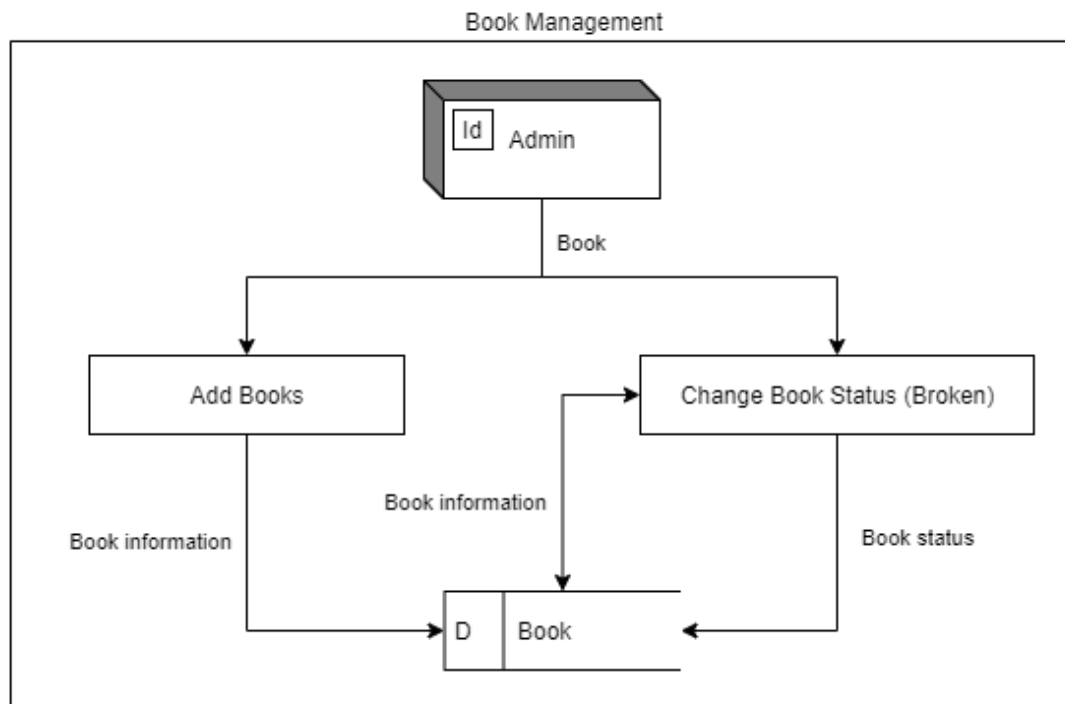
- Able to view and borrow books that are available.
- Able to edit their user account information. For example, change password, email and phone number.
- Able to view currently borrowed books.

SYSTEM & STORAGE DESIGN

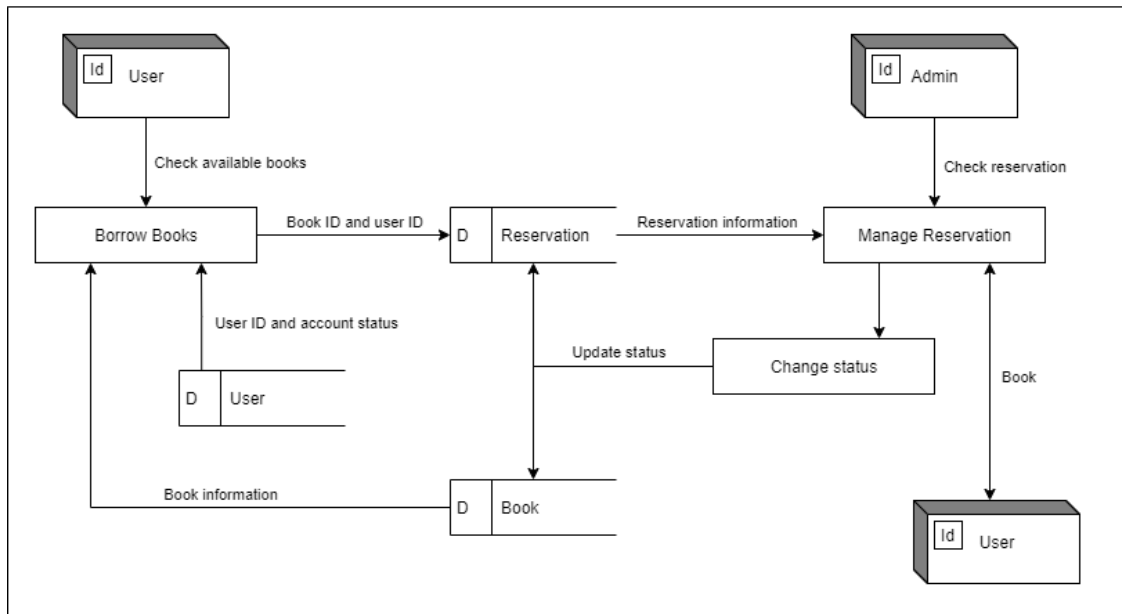
Use Case Diagram



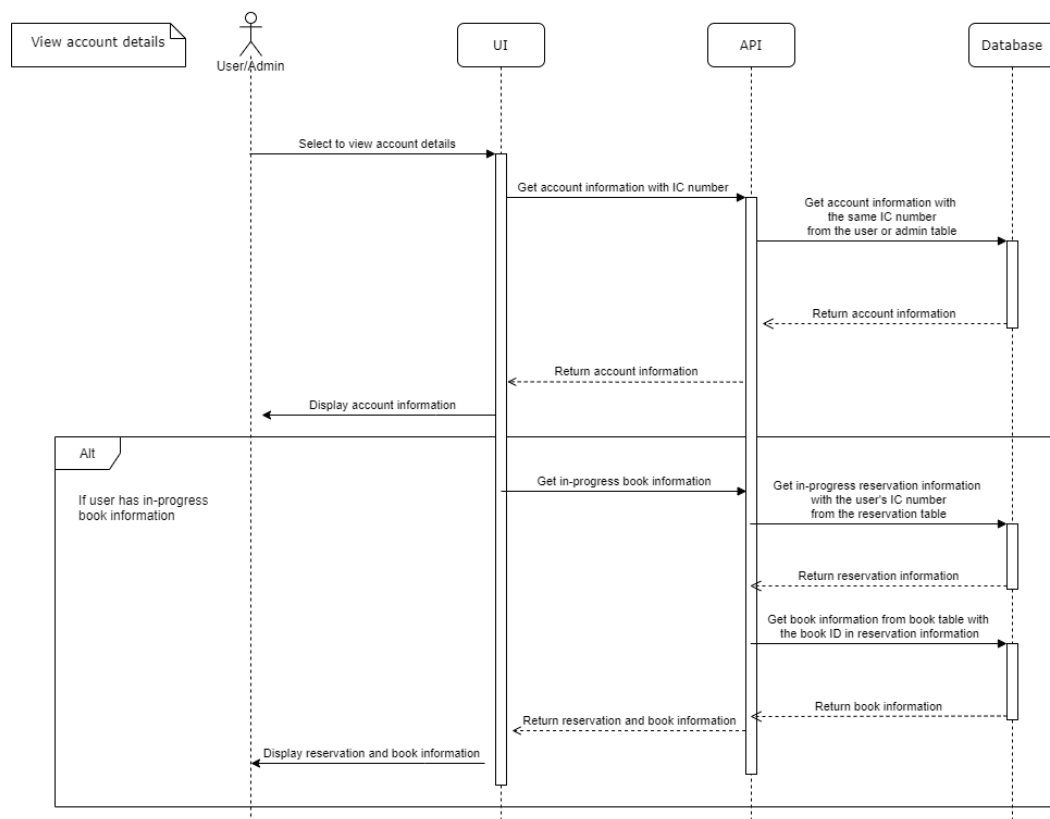
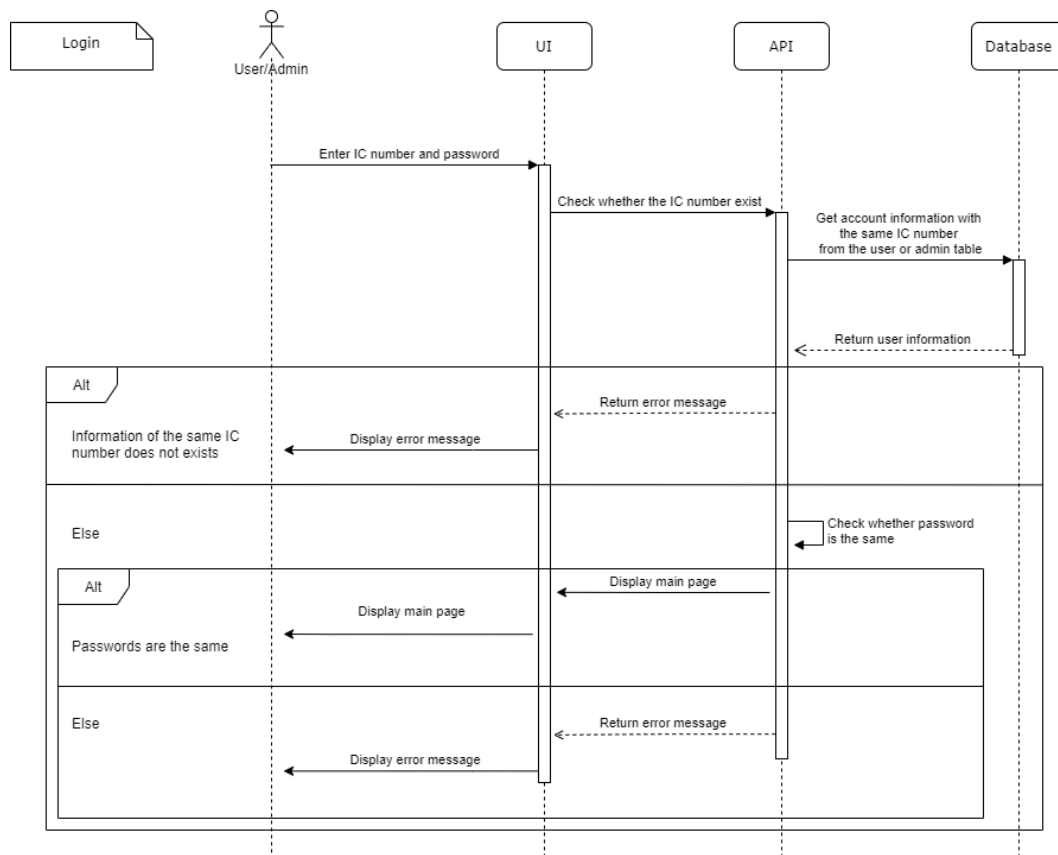
Data Flow Diagram

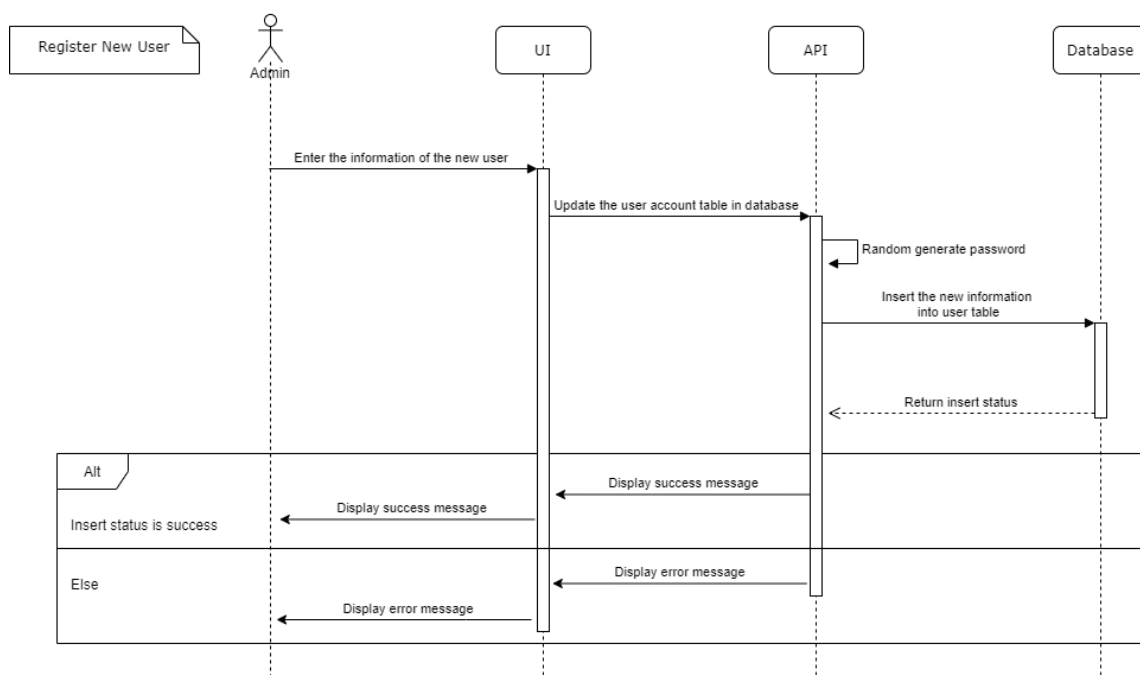
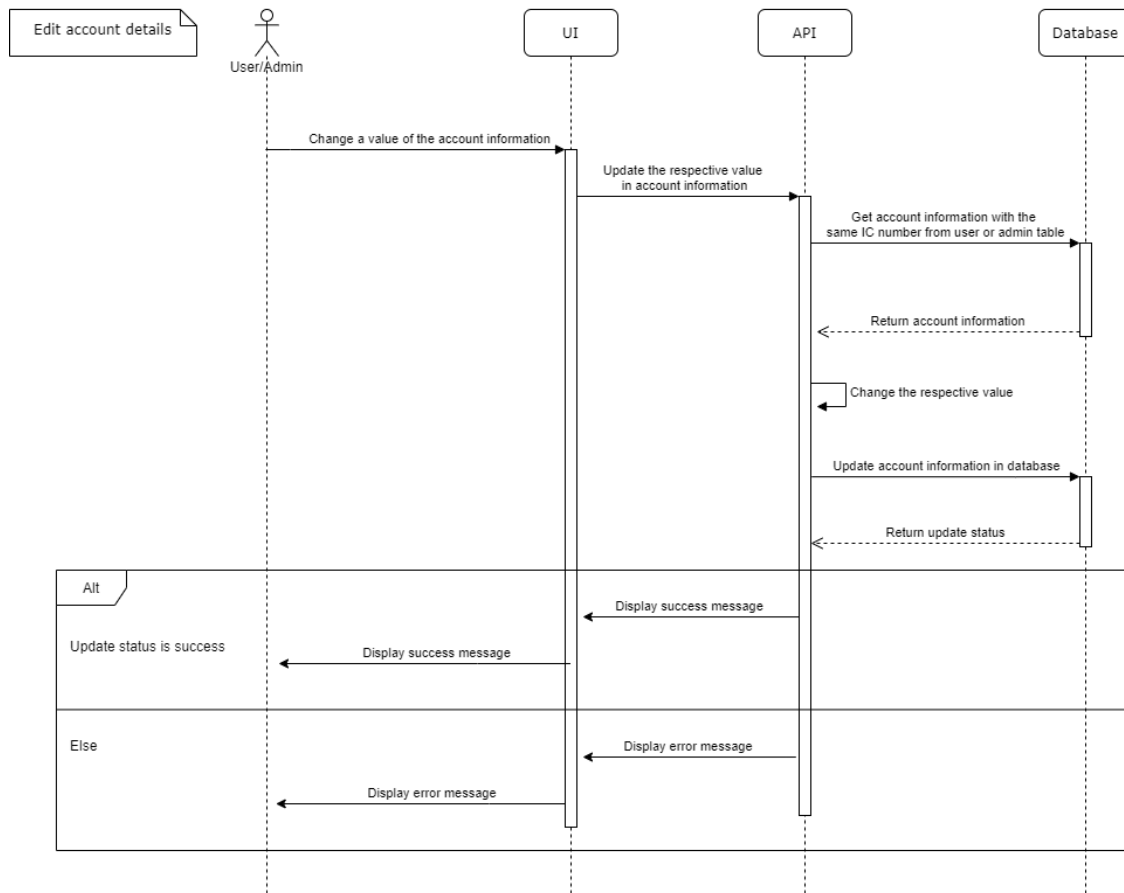


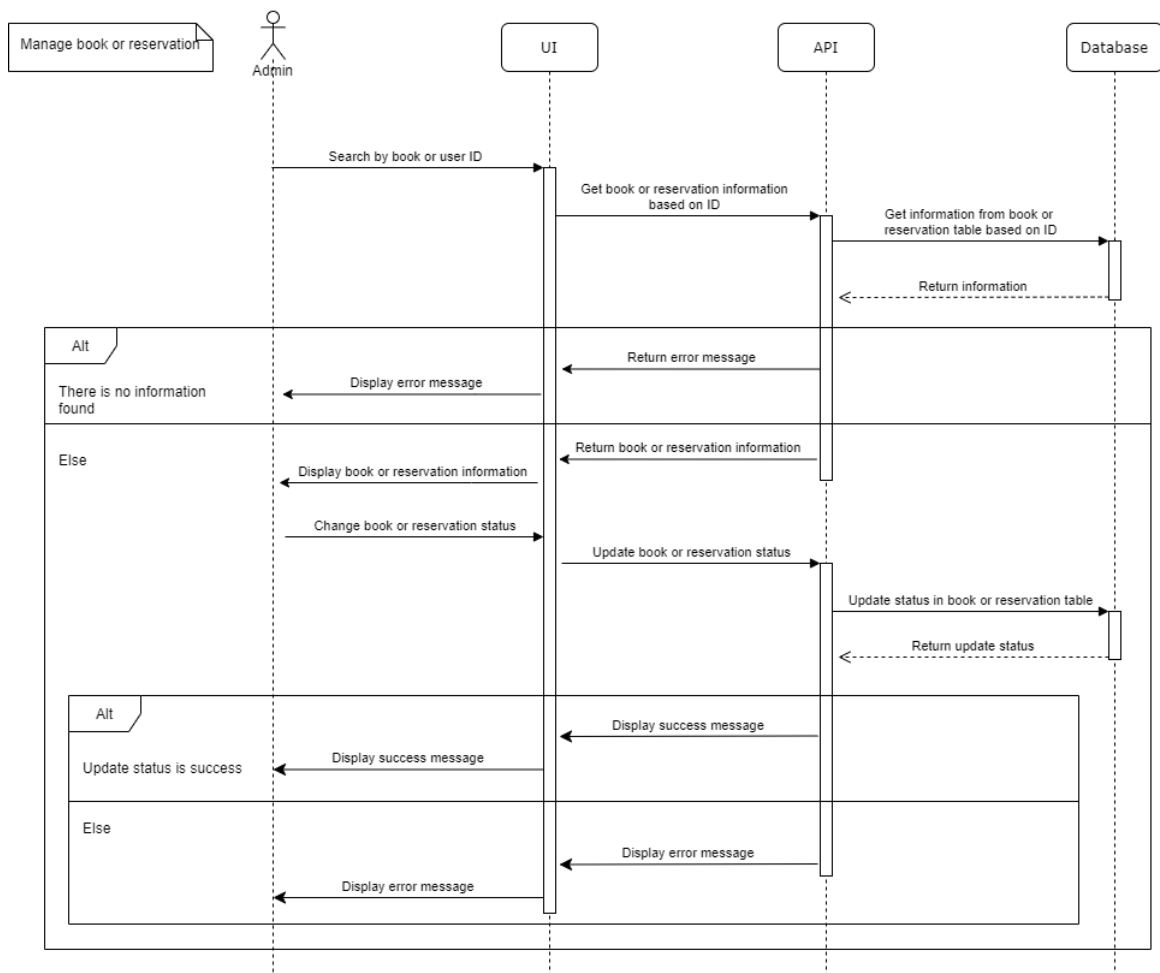
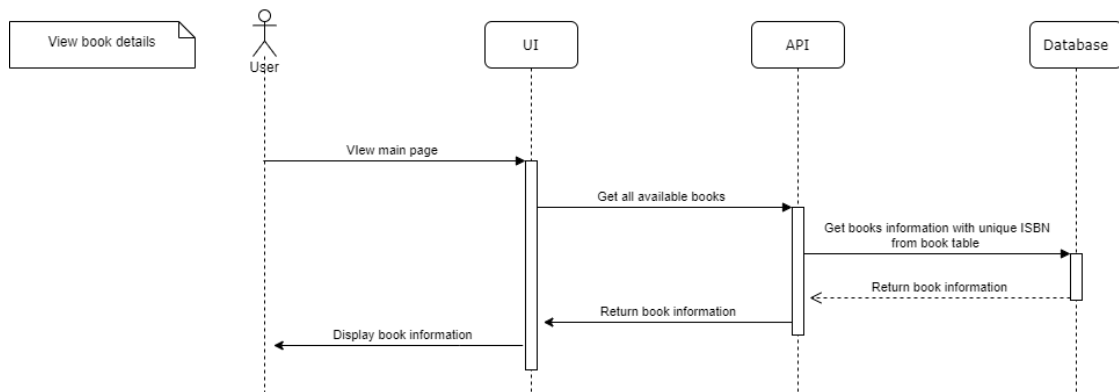
Process to borrow books

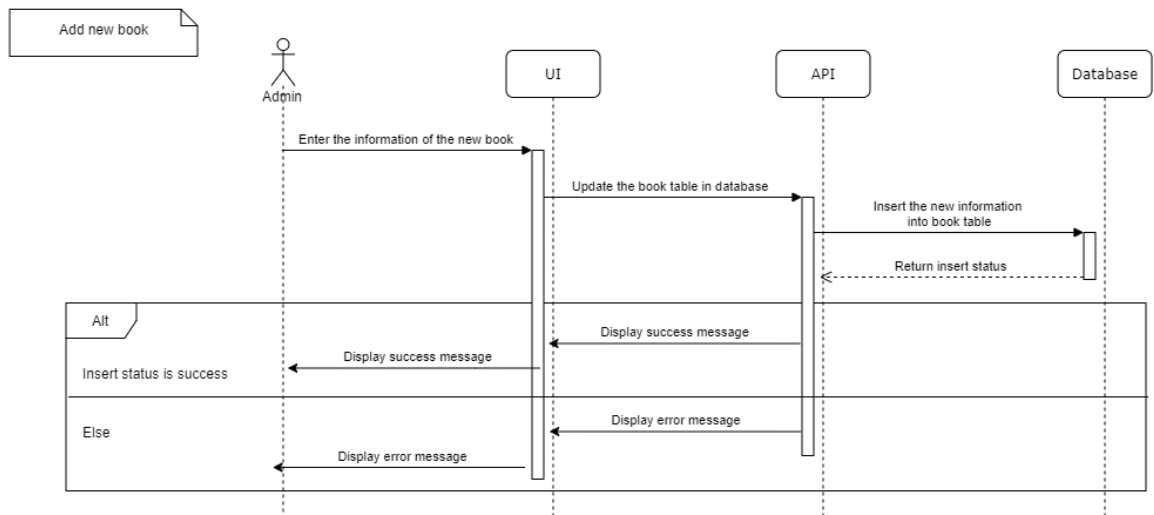
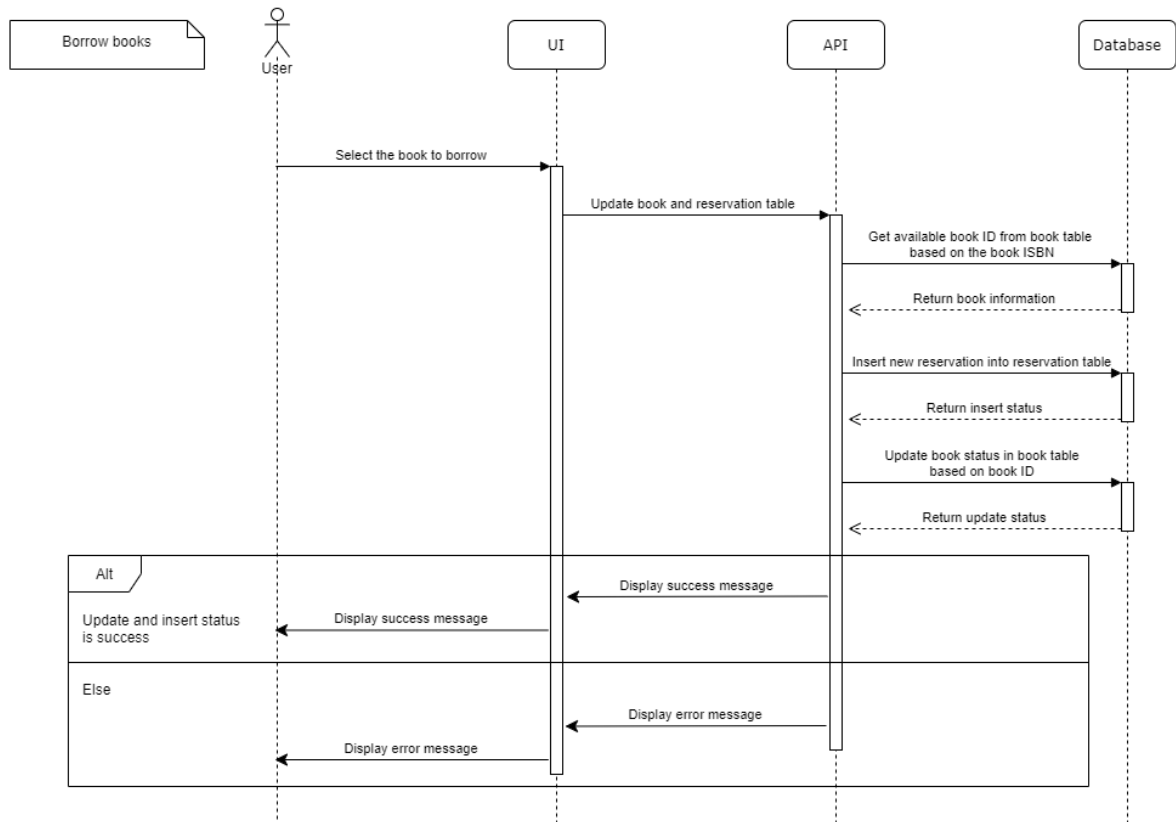


Sequence Diagram

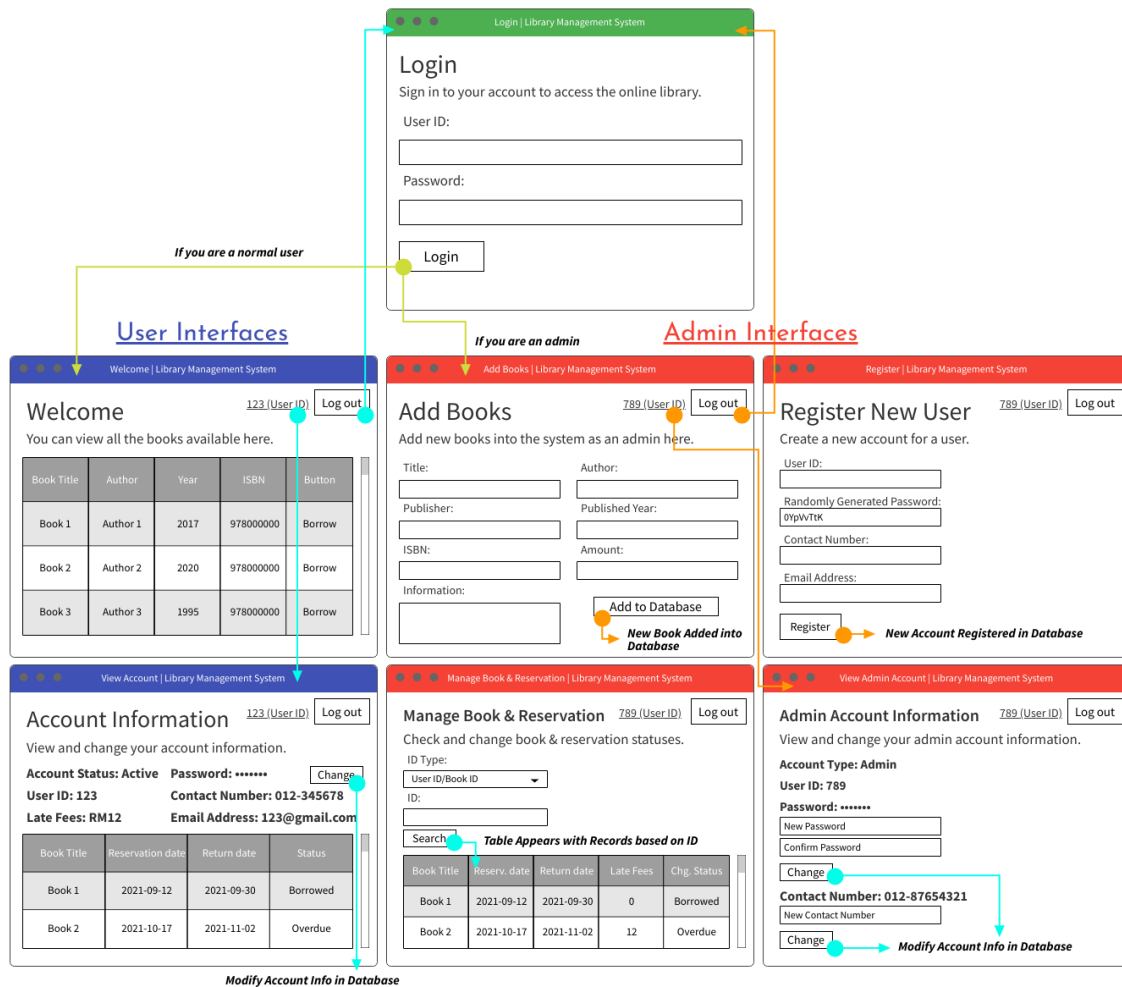




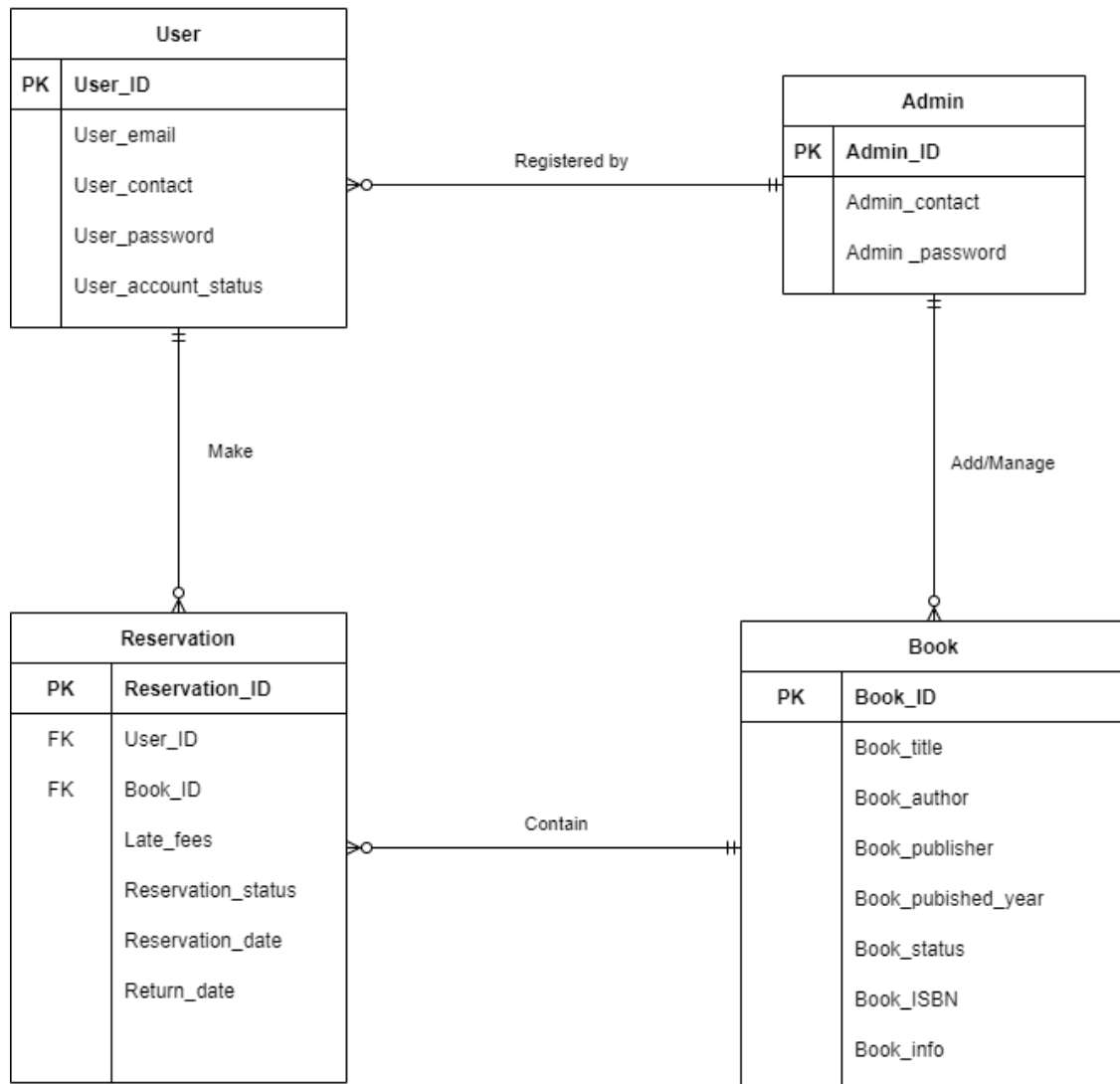




Website Wireframe and Website Flow



ER-Diagram

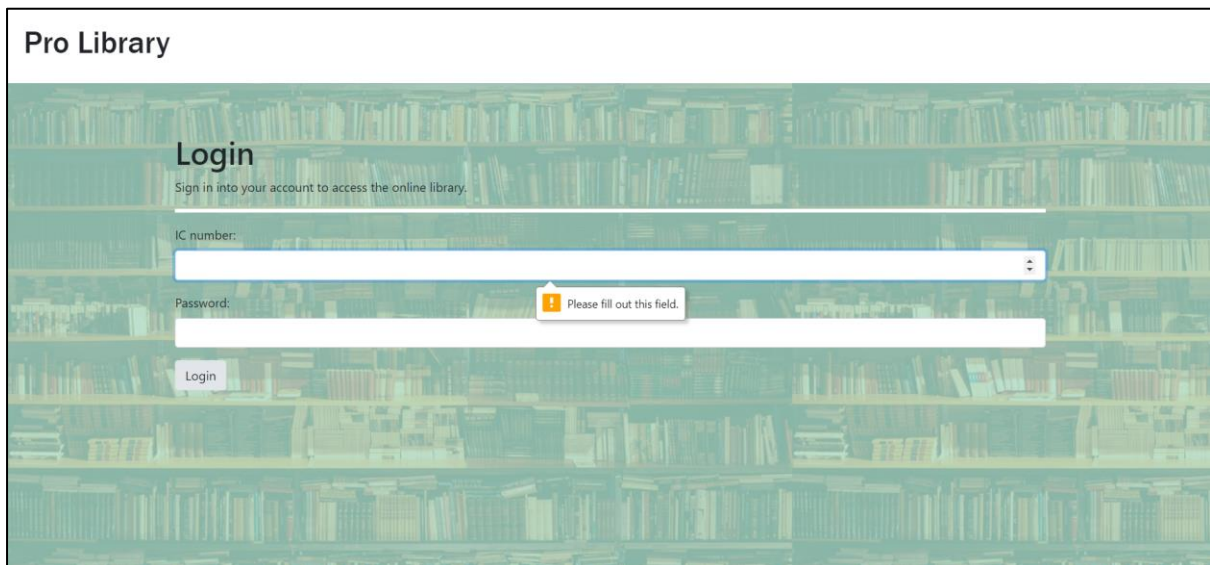


TESTING

Unit Testing

Login page

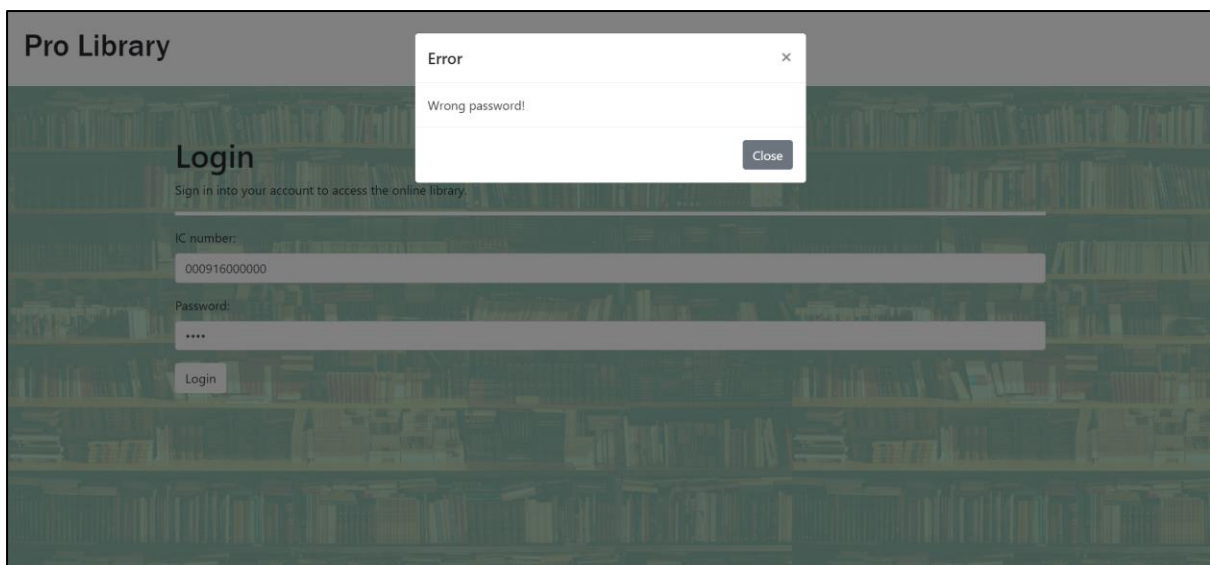
Error handling: When IC number or password was not entered



The screenshot shows the 'Pro Library' login page. The page has a header with the text 'Pro Library'. Below the header is a large background image of a library with bookshelves. Overlaid on this is a white login form. The form has a title 'Login' and a subtitle 'Sign in into your account to access the online library.' Below the subtitle are two input fields: 'IC number:' and 'Password:'. The 'IC number' field is empty. The 'Password' field contains a small orange warning icon and the text 'Please fill out this field.' Below the password field is a 'Login' button.

Login page

Error handling: When wrong password entered



The screenshot shows the 'Pro Library' login page with an error message. The page has a header with the text 'Pro Library'. Below the header is a large background image of a library with bookshelves. Overlaid on this is a white login form. The form has a title 'Login' and a subtitle 'Sign in into your account to access the online library.' Below the subtitle are two input fields: 'IC number:' and 'Password:'. The 'IC number' field contains the text '000916000000'. The 'Password' field contains four asterisks '****'. Below the password field is a 'Login' button. An error message box is displayed over the form, with the title 'Error' and a close button 'x'. The message text is 'Wrong password!'. There is a 'Close' button at the bottom right of the error message box.

Login page

Error handling: When the IC number entered does not exist in the database

Pro Library

Login

Sign in into your account to access the online library.

IC number:

000917000000

Password:

Login

Error

This account does not exist!

Close

Login page - Successful login to user main page

Pro Library

000916000000 Log out

Welcome

You can borrow all the books we have.

Show 10 entries

Search:

Book Title	Book Author	Book Publisher	Book Published Year	Book ISBN	Action
Harry Potter And The Philosopher's Stone (Harry Potter)	J. K. Rowling	Bloomsbury Pub Ltd	2000	9780747532743	Borrow
The Fault in Our Stars	John Green	Puffin Books an imprint of Penguin Books Ltd	2012	9780141345659	Borrow

Showing 1 to 2 of 2 entries

Previous1Next

Login page - Successful login to admin main page (Add new books)

Pro Library

Management ▾ 001222000000 Log out

Add book(s)

Please enter the book information below.

Title:

Author:

Publisher:

Published Year:

ISBN:

Information:

Amount:

Add to database

User main page

Error handling: Borrow buttons are disabled if there is no available book to be borrowed

Pro Library

000916000000 Log out

Welcome

You can borrow all the books we have.

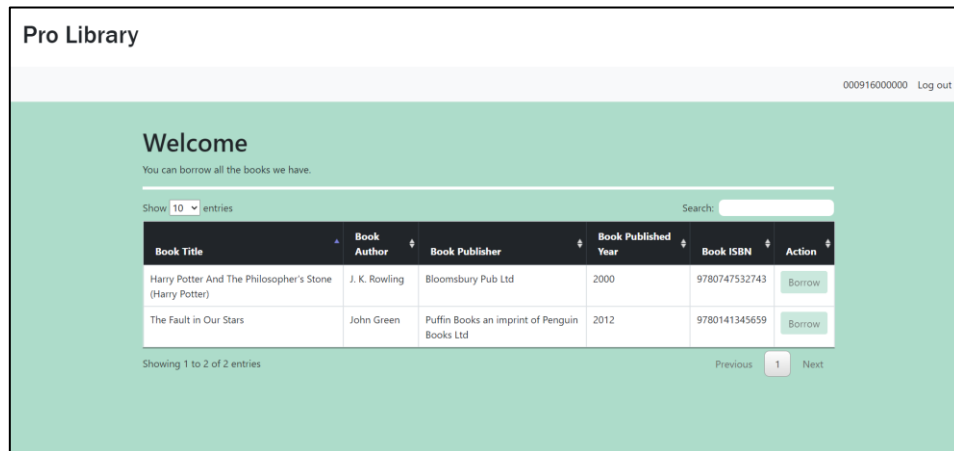
Show 10 ▾ entries Search:

Book Title	Book Author	Book Publisher	Book Published Year	Book ISBN	Action
Harry Potter And The Philosopher's Stone (Harry Potter)	J. K. Rowling	Bloomsbury Pub Ltd	2000	9780747532743	Borrow
The Fault in Our Stars	John Green	Puffin Books an imprint of Penguin Books Ltd	2012	9780141345659	Borrow

Showing 1 to 2 of 2 entries Previous 1 Next

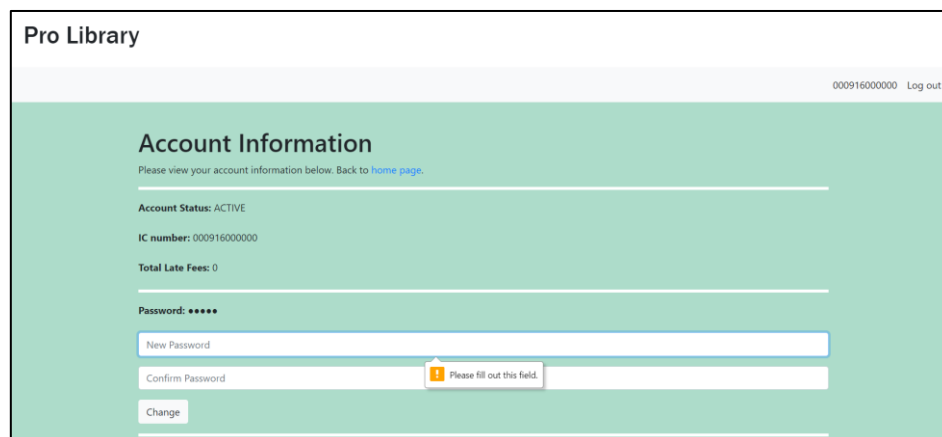
User main page

Error handling: Borrow buttons are disabled for frozen account or maximum books borrowed



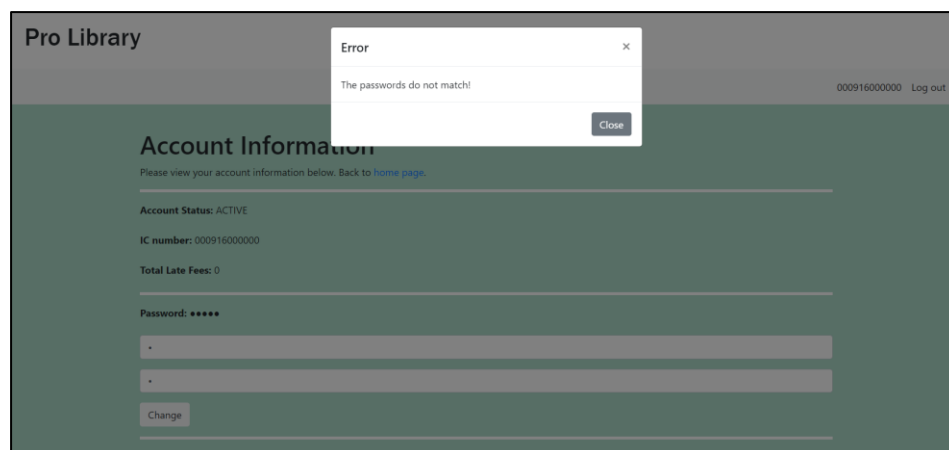
User/Admin view account details

Error handling: When user click the “Change” button without entering anything



User/Admin view account details

Error handling: When the passwords entered do not match



User/Admin view account details – Successfully changed password

Pro Library

Info

Password changed successfully!

Close

Please view your account information below

Account Status: ACTIVE

IC number: 000916000000

Total Late Fees: 0

Password: *****

Change

Contact Number: 0108195904

New Contact Number

000916000000 Log out

User/Admin view account details – Successfully changed contact number

Pro Library

Info

Contact Number changed successfully!

Close

New Password

Confirm Password

Change

Contact Number: 0108195904

0127765627

Change

Email Address: yixenlim@hotmail.com

New Email Address

Change

000916000000 Log out

User view account details – Successfully changed email

Pro Library

Info

Email changed successfully!

Close

New Contact Number

Change

Email Address: yixenlim@hotmail.com

1@gmail.com

Change

Reservation Details

Book ID	Book Title	Reservation_date	Return_date	Late Fees	Status
1	Harry Potter And The Philosopher's Stone (Harry Potter)	2021-10-12	2021-11-11	0	Borrowed

000916000000 Log out

Admin main page (Add new books)

Error handling: When “Add to database” button is clicked without entering the information

Pro Library

Management 001222000000 Log out

Add book(s)

Please enter the book information below.

Title:

Author:

Publisher:

Published Year:

ISBN:

Please fill out this field.

Admin main page (Add new books) – Successfully add books to database

Pro Library

Management 001222000000 Log out

Publisher:

Kexin Publisher

Published Year:

2011

ISBN:

00000

Information:

Info

Amount:

2

Add to database

Info

Book(s) added!

Close

Admin register new user

Error handling: When “Register” button is clicked without entering the information

Pro Library

Management 001222000000 Log out

Register New User

Please fill in the details to create an account.

IC number:

Generated Password:

Contact Number:

Email Address:

Register

Please fill out this field.

Admin register new user

Error handling: When the IC number entered existed in the database

The screenshot shows the 'Pro Library' interface with a 'Register New User' form. An 'Info' modal box is open, displaying the message: 'Registration Error: Check if the IC number has been registered before.' The form fields are filled with the following data: IC number: 00091600000, Generated Password: 1jcty4FS, Contact Number: 0108195904, and Email Address: yixenlim@hotmail.com. A 'Register' button is at the bottom of the form.

Admin register new user – Successfully registered new user

The screenshot shows the 'Pro Library' interface with the 'Register New User' form. An 'Info' modal box is open, displaying the message: 'New account created successfully!'. The form fields are filled with the same data as in the previous screenshot: IC number: 000916010000, Generated Password: dwbz3uaG, Contact Number: 0108195904, and Email Address: yixenlim@hotmail.com. A 'Register' button is at the bottom of the form.

Admin manage book and reservation

Error handling: Admin is not able to change the book status if the book is reserved or borrowed

The screenshot shows the 'Pro Library' interface with the 'Manage Book And Reservation' form. The form has a search bar with the text 'Please enter the ID below.' and a dropdown menu for 'ID type' set to 'Book ID'. The 'ID' field contains the value '2'. A 'Search' button is below the form. Below the form is a table with the following data:

Book ID	Book Title	Author	Publisher	Published Year	ISBN	Status
2	Harry Potter And The Philosopher's Stone (Harry Potter)	J. K. Rowling	Bloomsbury Pub Ltd	2000	9780747532743	Borrowed

Admin manage book and reservation – Successfully updated book status

Pro Library

Info

Book status updated!

Close

Management 001222000000 Log out

Manage Book And Reservation

Please enter the ID below.

ID type:

Book ID

ID:

5

Search

Book ID	Book Title	Author	Publisher	Published Year	ISBN	Status
5	ABC	Yixen	Kexin Publisher	2011	00000	Unavailable

Update

Admin manage book and reservation – Successfully updated reservation

Pro Library

Info

Book status updated!

Close

Management 001222000000 Log out

ID:

000916000000

Search

Book ID	Book Title	Author	Publisher	Published Year	ISBN	Reservation_date	Return_date	Late Fees	Status
1	Harry Potter And The Philosopher's Stone (Harry Potter)	J. K. Rowling	Bloomsbury Pub Ltd	2000	9780747532743	2021-10-12	2021-11-11	0	Available
3	The Fault in Our Stars	John Green	Puffin Books an imprint of Penguin Books Ltd	2012	9780141345659	2021-11-02	2021-12-02	0	Borrowed
4	The Fault in Our Stars	John Green	Puffin Books an imprint of Penguin Books Ltd	2012	9780141345659	2021-11-02	2021-12-02	0	Borrowed

Update

Website Screenshots

Login

Pro Library

Login

Sign in into your account to access the online library.

IC number:

Password:

Login

User - main page

Pro Library

000916000000 Log out

Welcome

You can borrow all the books we have.

Show 10 entries

Search:

Book Title	Book Author	Book Publisher	Book Published Year	Book ISBN	Action
Harry Potter And The Philosopher's Stone (Harry Potter)	J. K. Rowling	Bloomsbury Pub Ltd	2000	9780747532743	Borrow
The Fault in Our Stars	John Green	Puffin Books an imprint of Penguin Books Ltd	2012	9780141345659	Borrow

Showing 1 to 2 of 2 entries

Previous 1 Next

User – View account details

Pro Library

000916000000Log out

Account Information

Please view your account information below. Back to [home page](#).

Account Status: ACTIVE

IC number: 000916000000

Total Late Fees: 0

Password: *****

New Password

Confirm Password

Change

Contact Number: 0108195904

New Contact Number

Change

Email Address: yixenlim@hotmail.com

New Email Address

Change

Reservation Details

Book ID	Book Title	Reservation_date	Return_date	Late Fees	Status
1	Harry Potter And The Philosopher's Stone (Harry Potter)	2021-10-12	2021-11-11	0	Borrowed

Admin – View account details

Pro Library

Management001222000000Log out

Admin Account Information

Please view your account information below. Back to [home page](#).

Account Type: Administrator

IC number: 001222000000

Password: *****

New Password

Confirm Password

Change

Contact Number: 0127470851

New Contact Number

Change

Admin - main page (Add new books)

Pro Library

Management ▾ 001222000000 Log out

Add book(s)

Please enter the book information below.

Title:

Author:

Publisher:

Published Year:

ISBN:

Information:

Amount:

Add to database

Admin – Register new user

Pro Library

Management ▾ 001222000000 Log out

Register New User

Please fill in the details to create an account.

IC number:

Generated Password:

1jcty4FS

Contact Number:

Email Address:

Register

Admin – Manage book and reservation

Pro Library

Management 001222000000 Log out

Manage Book And Reservation

Please enter the ID below.

ID type:

Book ID

ID:

2

Search

Book ID	Book Title	Author	Publisher	Published Year	ISBN	Status
2	Harry Potter And The Philosopher's Stone (Harry Potter)	J. K. Rowling	Bloomsbury Pub Ltd	2000	9780747532743	Borrowed

Pro Library

Management 001222000000 Log out

Manage Book And Reservation

Please enter the ID below.

ID type:

User ID

ID:

000916000000

Search

Book ID	Book Title	Author	Publisher	Published Year	ISBN	Reservation_date	Return_date	Late Fees	Status
1	Harry Potter And The Philosopher's Stone (Harry Potter)	J. K. Rowling	Bloomsbury Pub Ltd	2000	9780747532743	2021-10-12	2021-11-11	0	Borrowed
3	The Fault in Our Stars	John Green	Puffin Books an imprint of Penguin Books Ltd	2012	9780141345659	2021-11-02	2021-12-02	0	Reserved
4	The Fault in Our Stars	John Green	Puffin Books an imprint of Penguin Books Ltd	2012	9780141345659	2021-11-02	2021-12-02	0	Reserved

Update

CONCLUSION

In a nutshell, this project to build a library management system will be extremely useful for librarians to connect with their customers during this pandemic period. This system will be able to lessen the contact time between librarians and the customers and also provide a seamless experience for both parties to conduct their business without having to expose themselves to a high risk of contracting COVID-19. Other future works could be done in order to add more functionality to what this current library management system can do.