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:

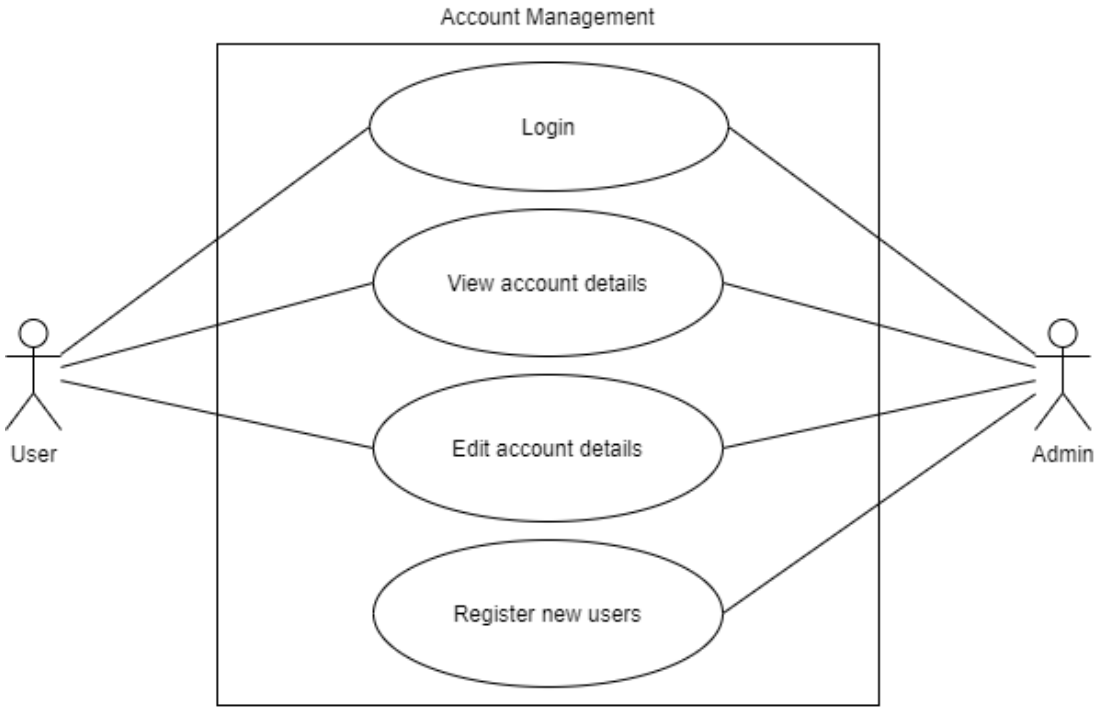
- Able to add new books into the library's book database.
- Able to edit the status of the books.
- Able to register new users.

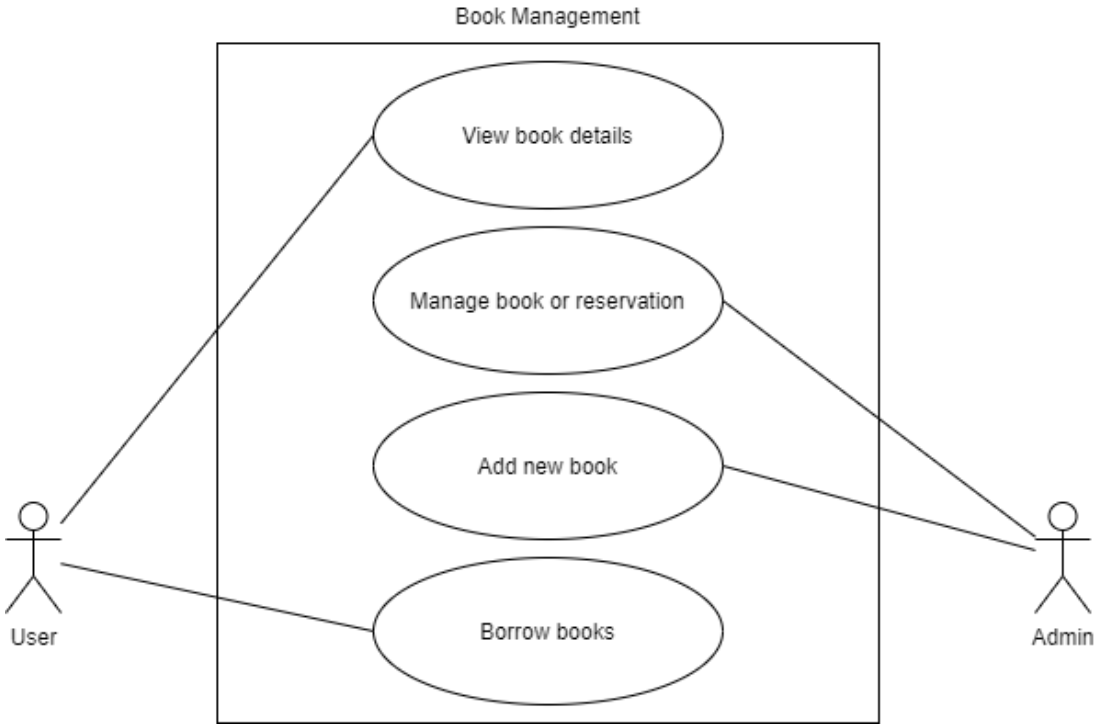
On the other hand, some functions for the ‘User’ includes:

- 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.

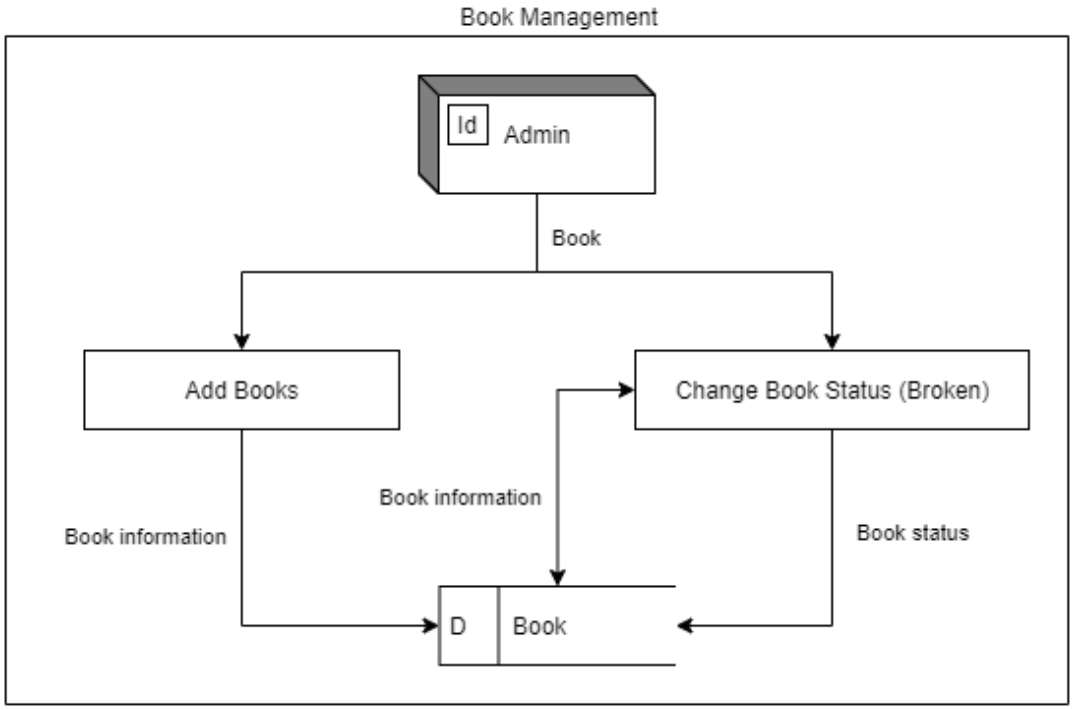
SYSTEM & STORAGE DESIGN

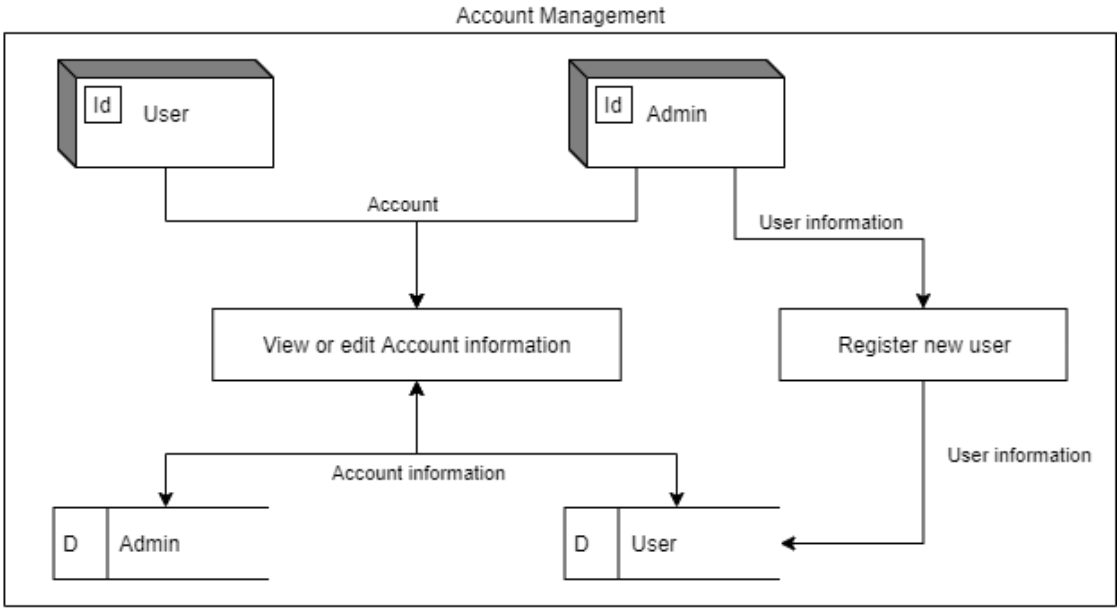
Use Case Diagram



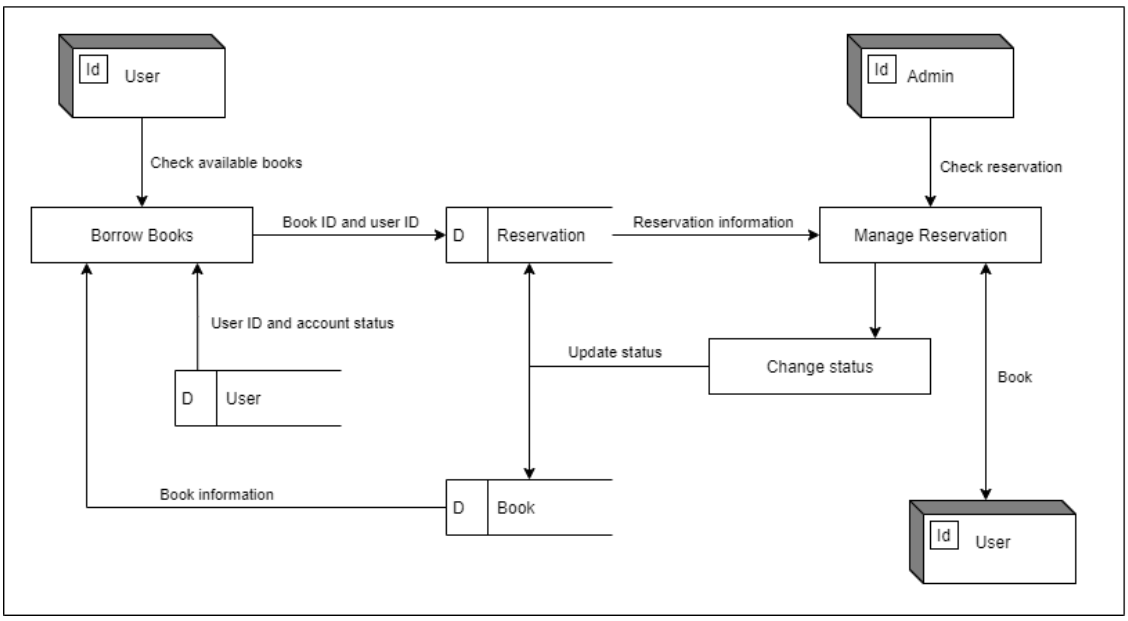


Data Flow Diagram

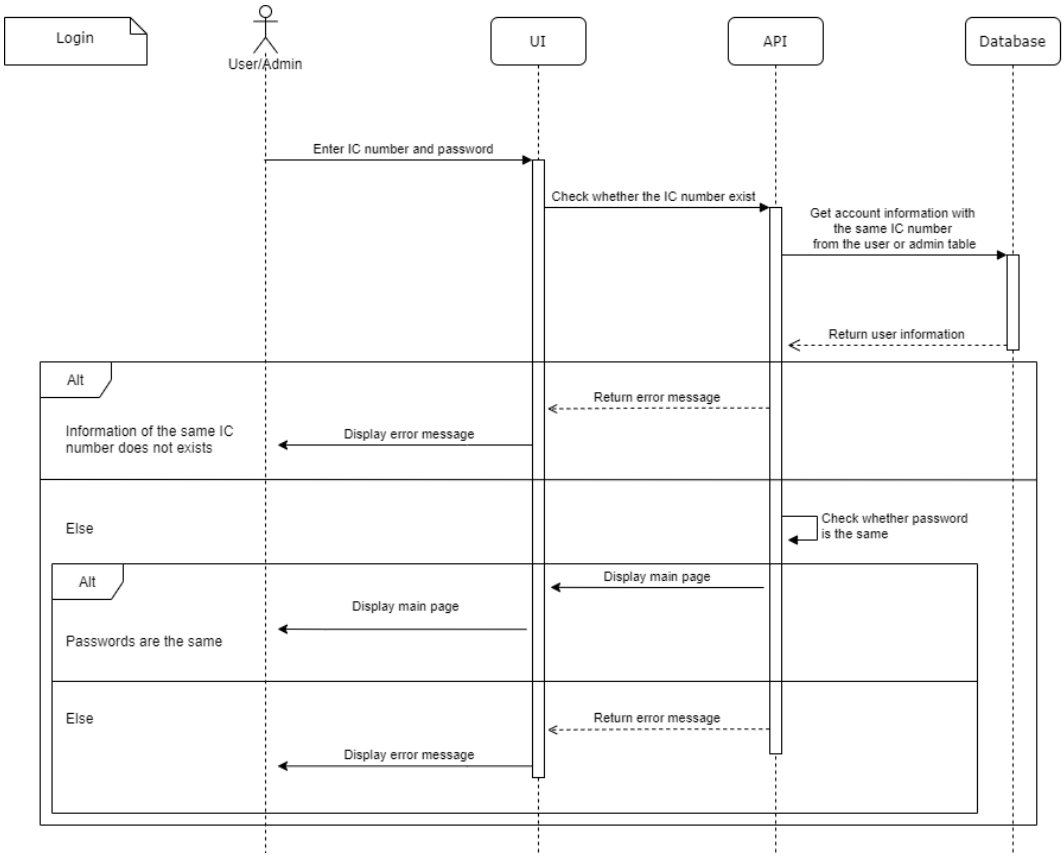


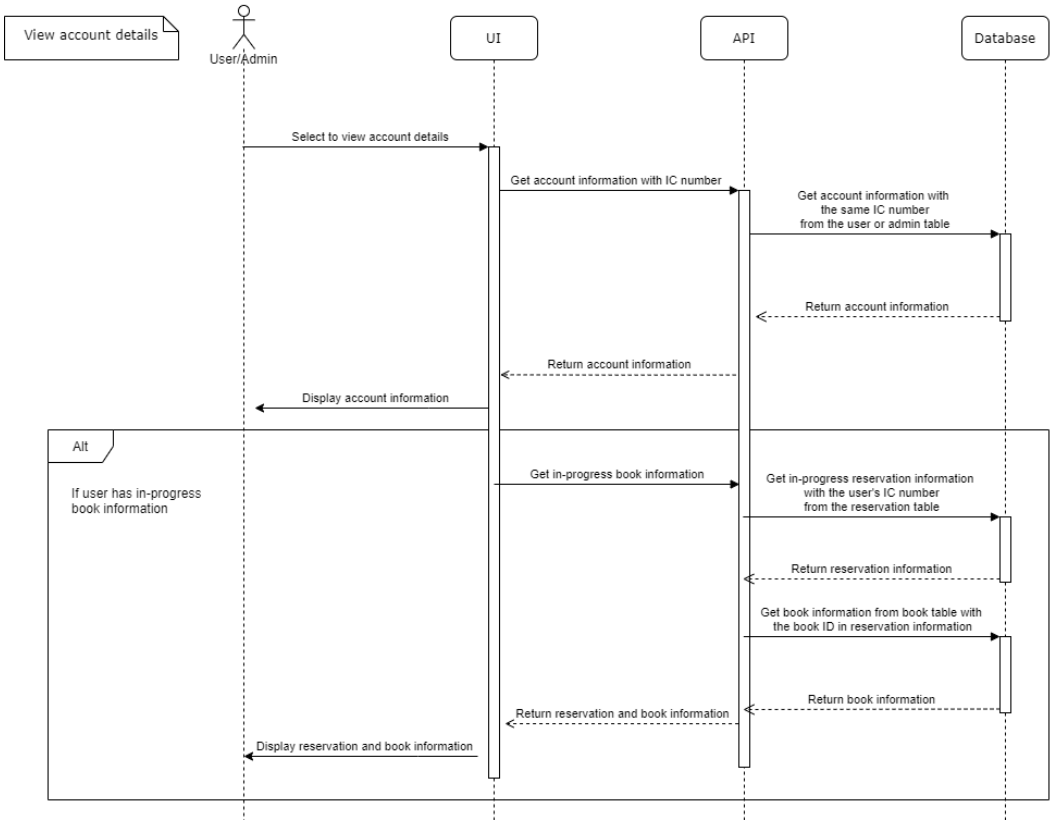


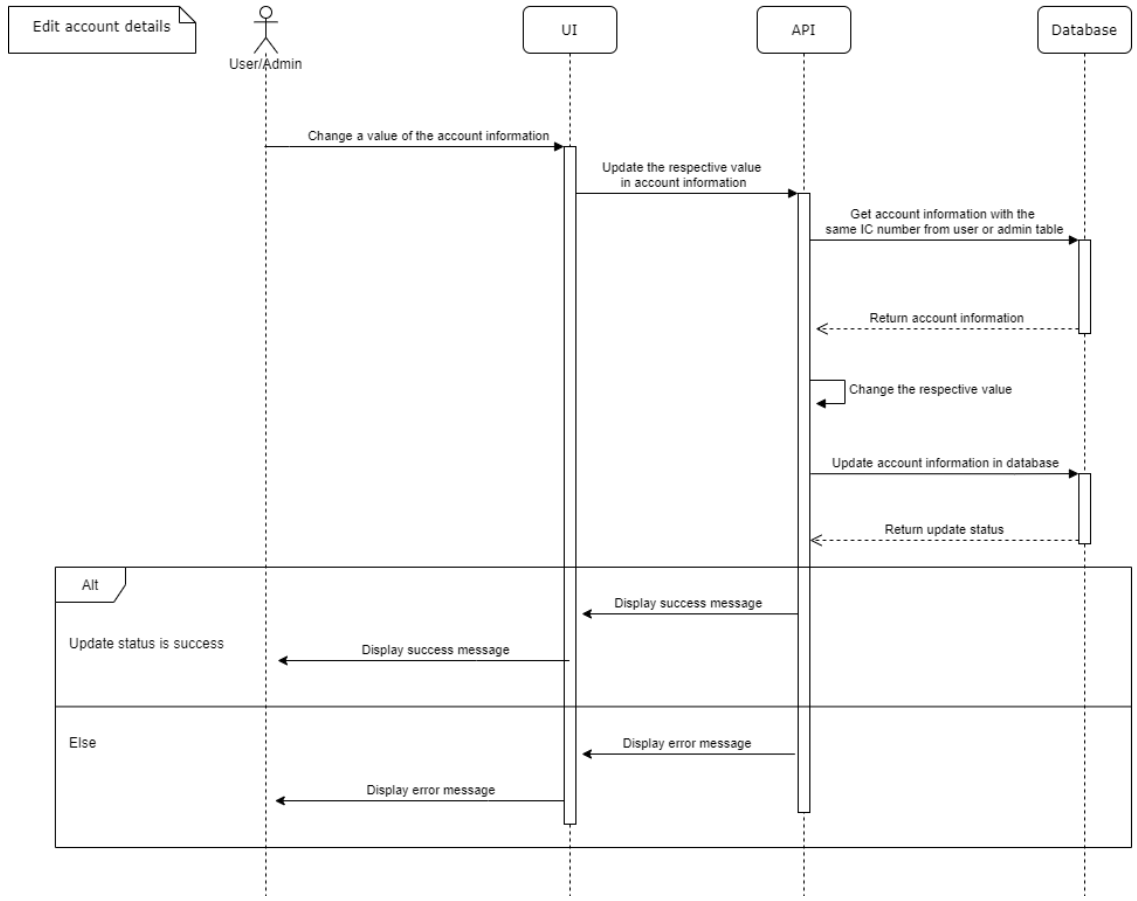
Process to borrow books

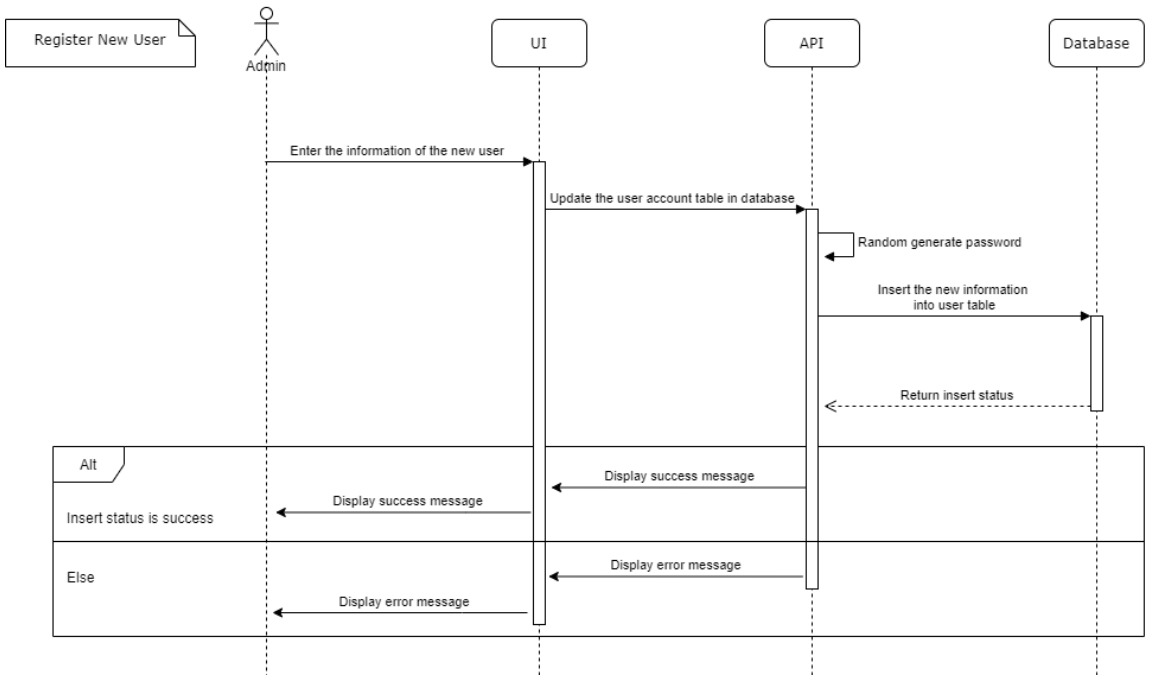


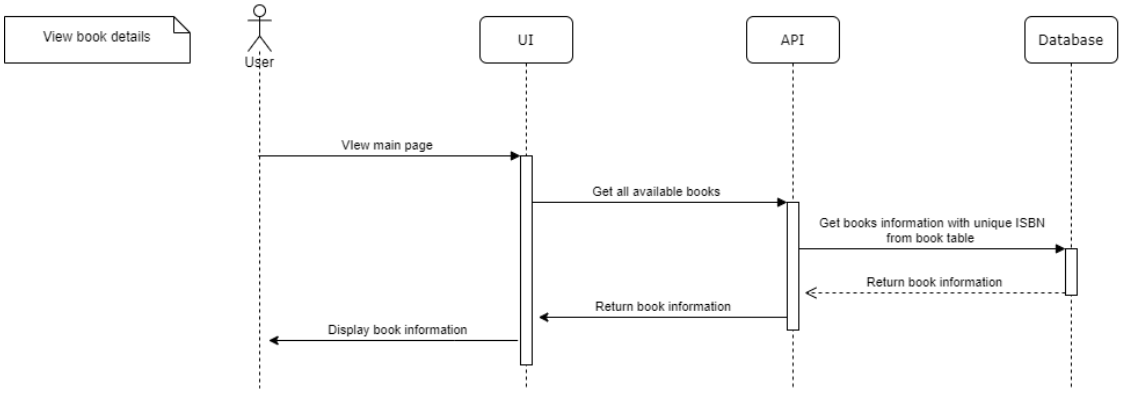
Sequence Diagram

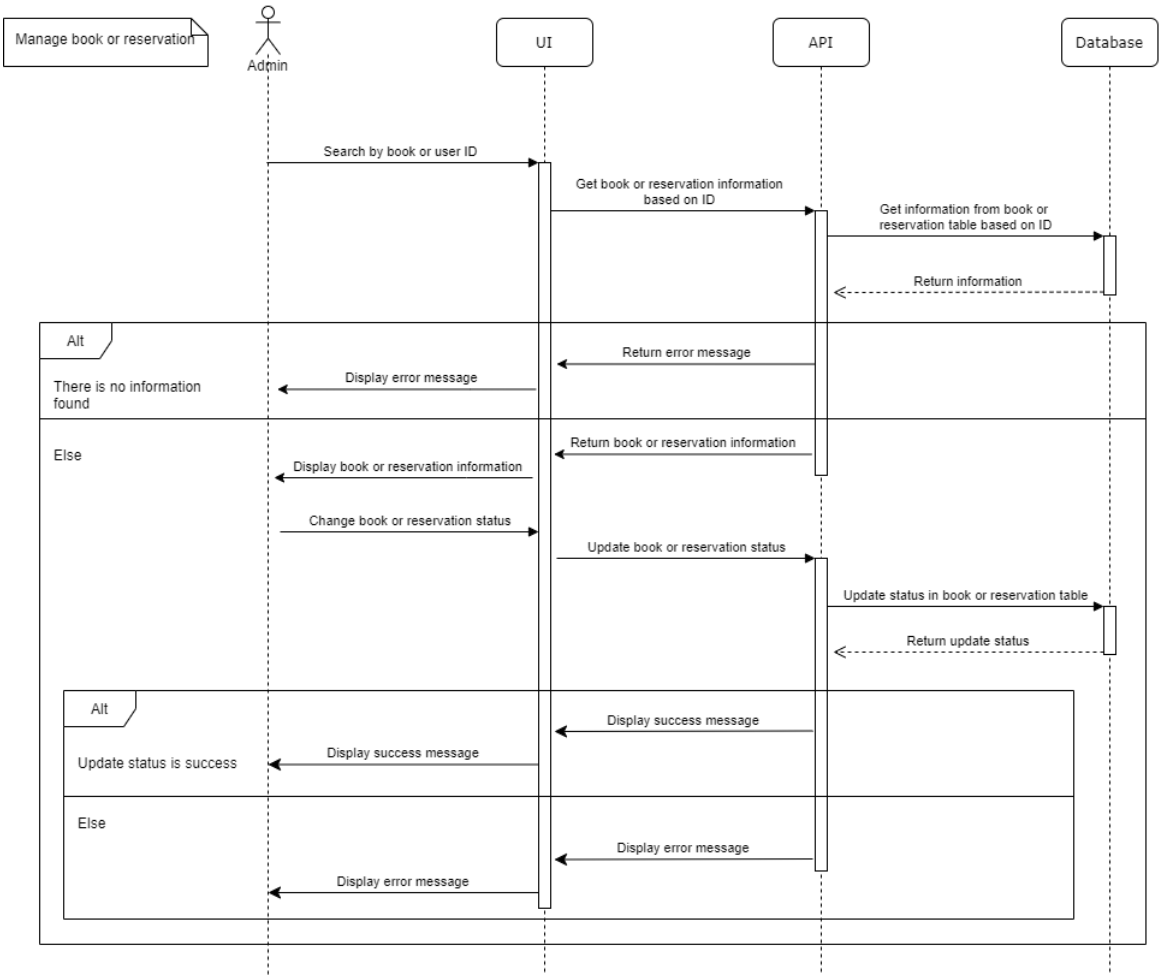


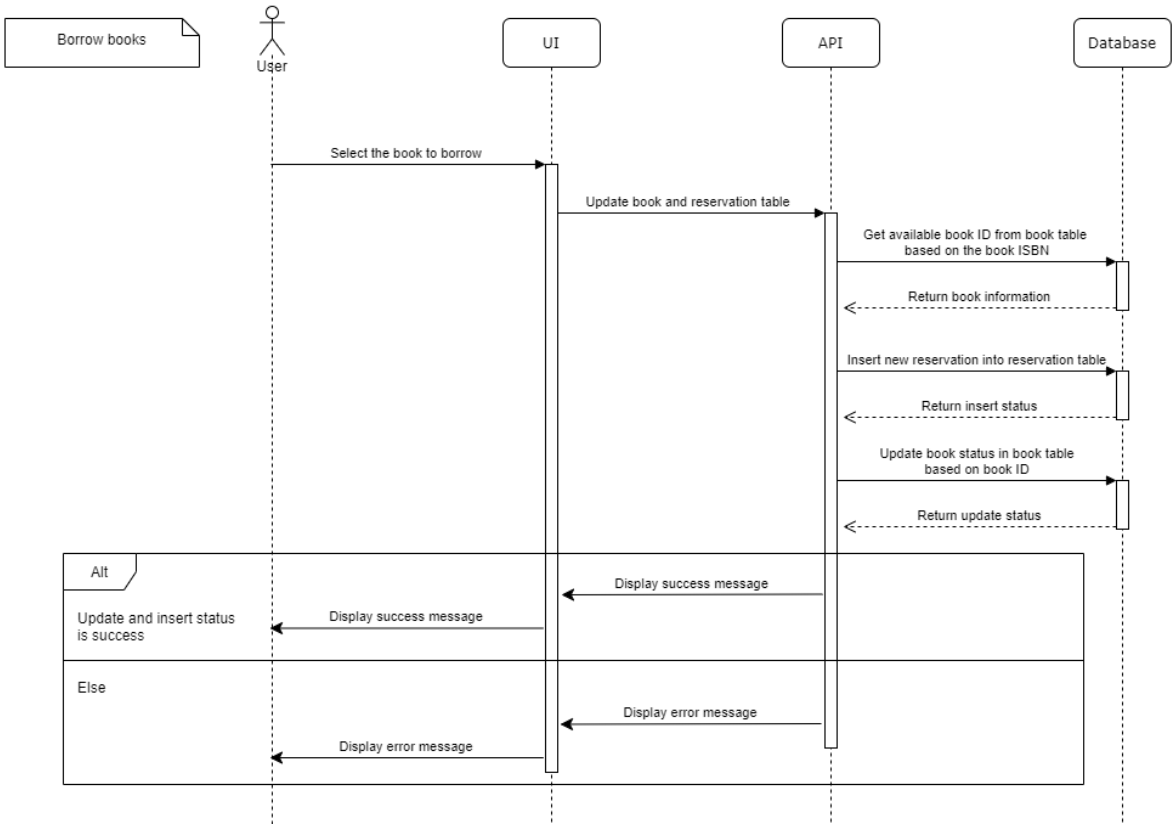


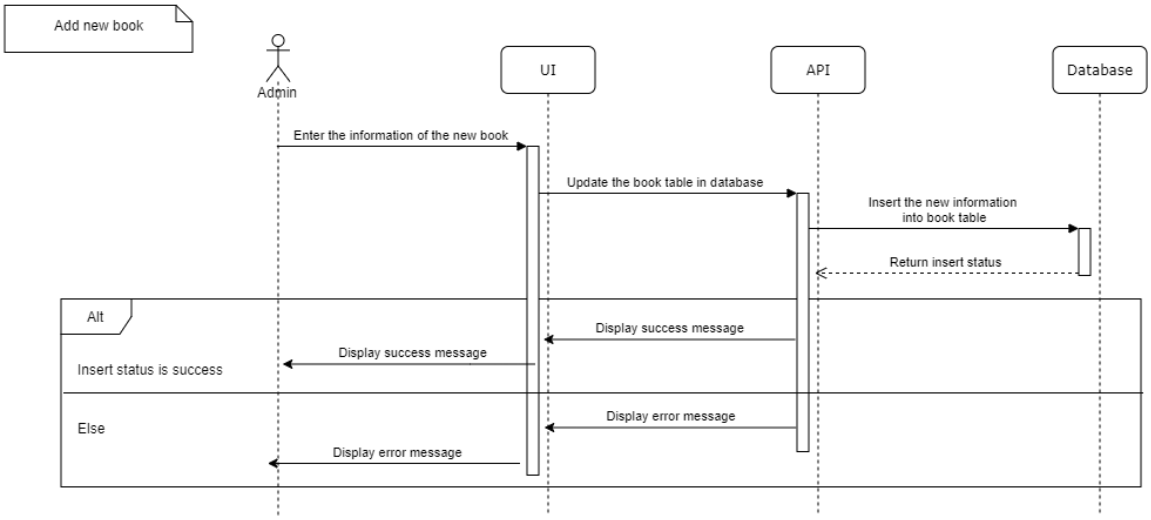

Edit account details
User/Admin
UI
API
Database
Change a value of the account information
Update the respective value in account information
Get account information with the same IC number from user or admin table
Return account information
Change the respective value
Update account information in database
Return update status
Alt
Update status is success
Display success message
Display success message
Else
Display error message
Display error message


Register New User
Admin
UI
API
Database
Enter the information of the new user
Update the user account table in database
Random generate password
Insert the new information into user table
Return insert status
Alt
Insert status is success
Display success message
Display success message
Else
Display error message
Display error message


View book details
User
UI
API
Database
VIew main page
Get all available books
Get books information with unique ISBN from book table
Return book information
Return book information
Display book information

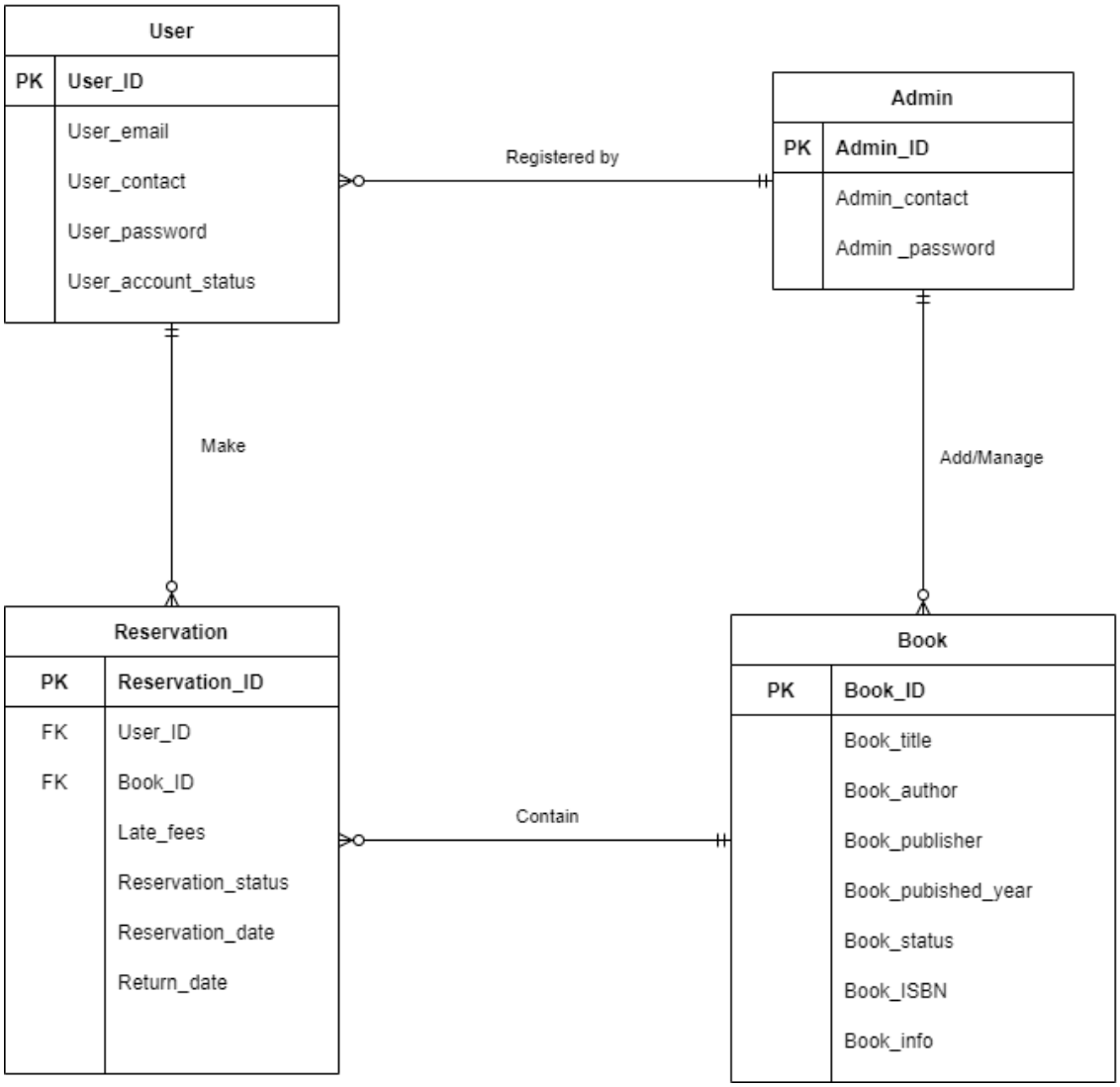

Manage book or reservation
Admin
UI
API
Database
Search by book or user ID
Get book or reservation information based on ID
Get information from book or reservation table based on ID
Return information
Alt
There is no information found
Return error message
Display error message
Else
Return book or reservation information
Display book or reservation information
Change book or reservation status
Update book or reservation status
Update status in book or reservation table
Return update status
Alt
Update status is success
Display success message
Display success message
Else
Display error message
Display error message


Borrow books
User
UI
API
Database
Select the book to borrow
Update book and reservation table
Get available book ID from book table based on the book ISBN
Return book information
Insert new reservation into reservation table
Return insert status
Update book status in book table based on book ID
Return update status
Alt
Update and insert status is success
Display success message
Display success message
Else
Display error message
Display error message


Add new book
Admin
UI
API
Database
Enter the information of the new book
Update the book table in database
Insert the new information into book table
Return insert status
Alt
Insert status is success
Display success message
Display success message
Else
Display error message
Display error message

Website Wireframe and Website Flow

ER-Diagram

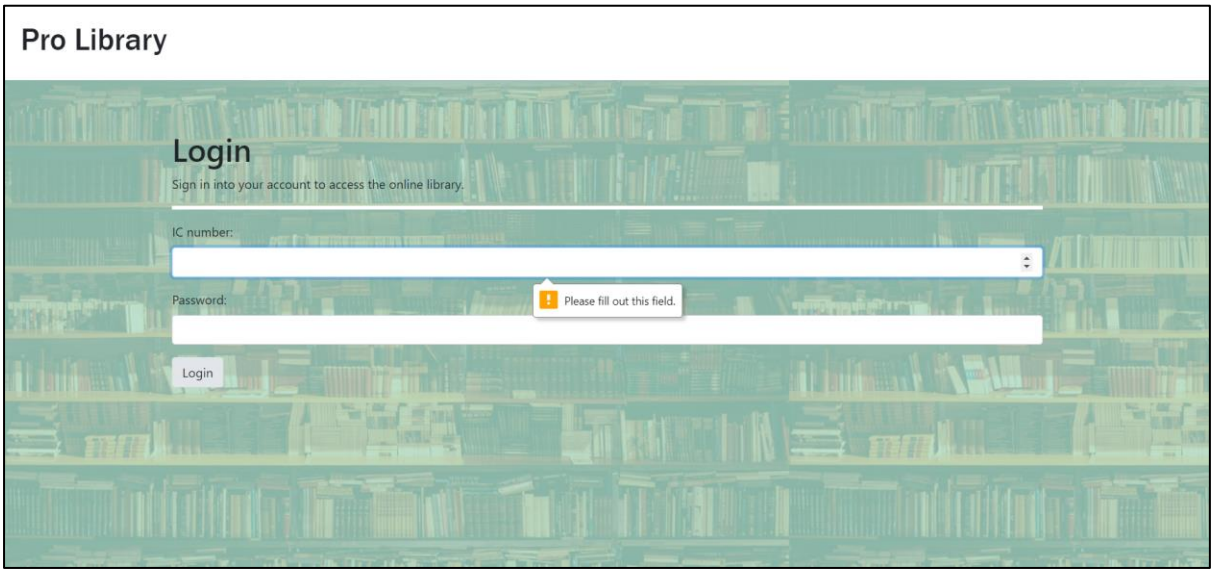

User
PK
User_ID
User_email
User_contact
User_password
User_account_status
Registered by
Admin
PK
Admin_ID
Admin_contact
Admin _password
Make
Add/Manage
Reservation
PK
Reservation_ID
FK
User_ID
FK
Book_ID
Late_fees
Reservation_status
Reservation_date
Return_date
Contain
Book
PK
Book_ID
Book_title
Book_author
Book_publisher
Book_pubished_year
Book_status
Book_ISBN
Book_info

TESTING

Unit Testing

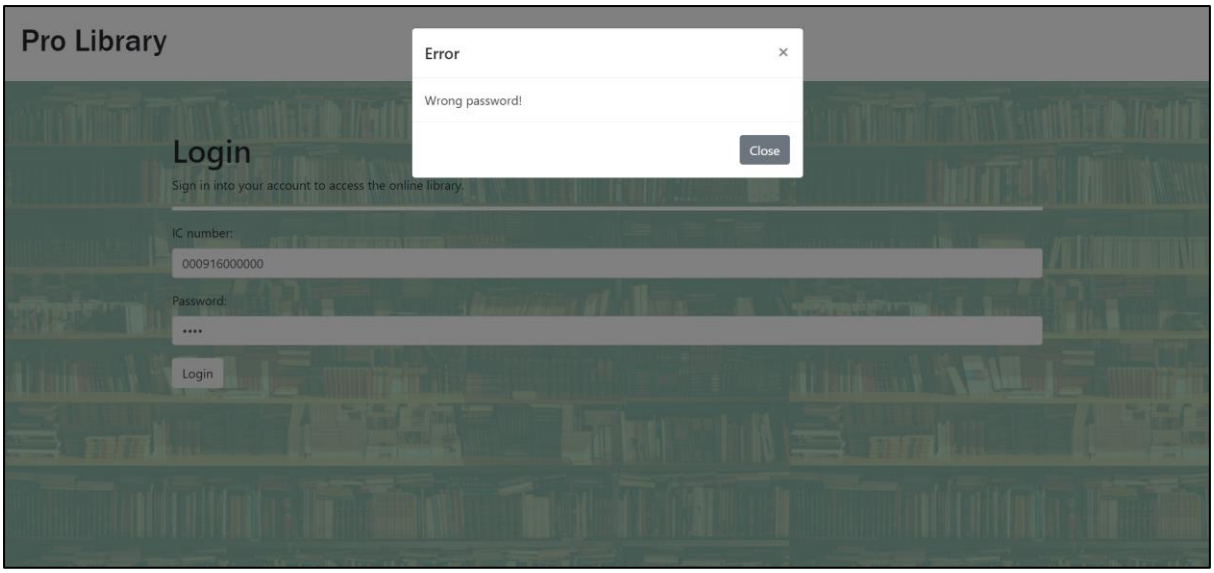
Login page

Error handling: When IC number or password was not entered



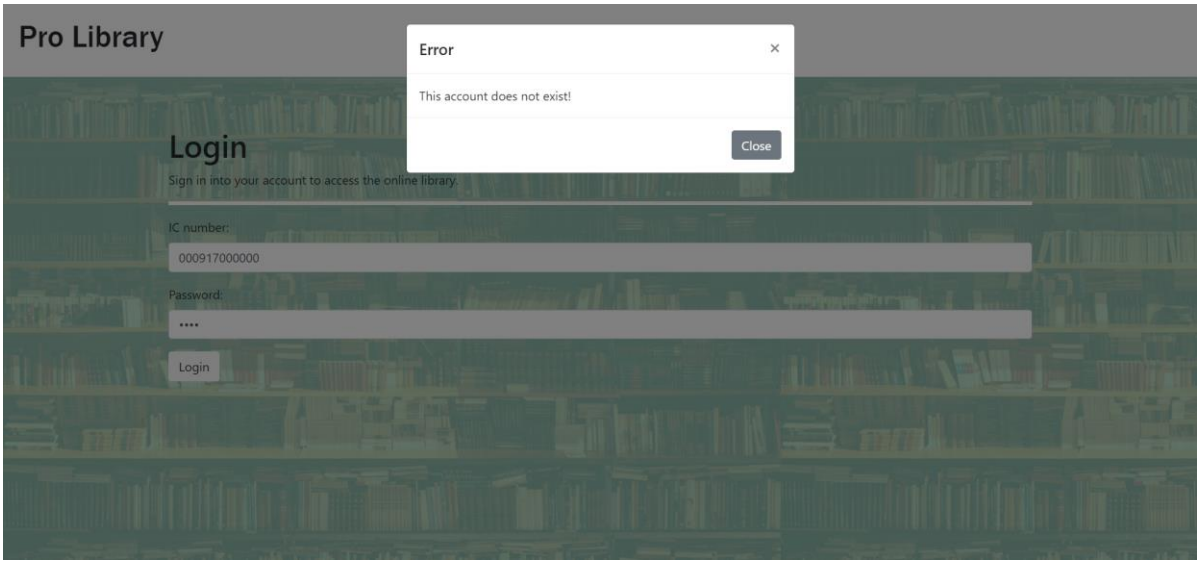
Login page

Error handling: When wrong password entered

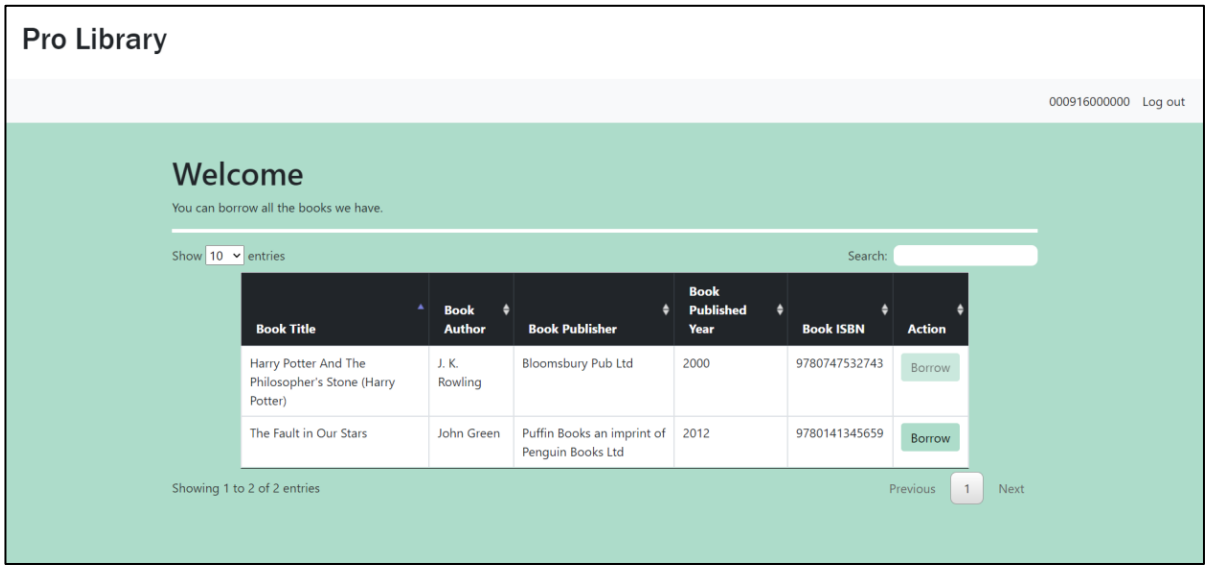


Login page

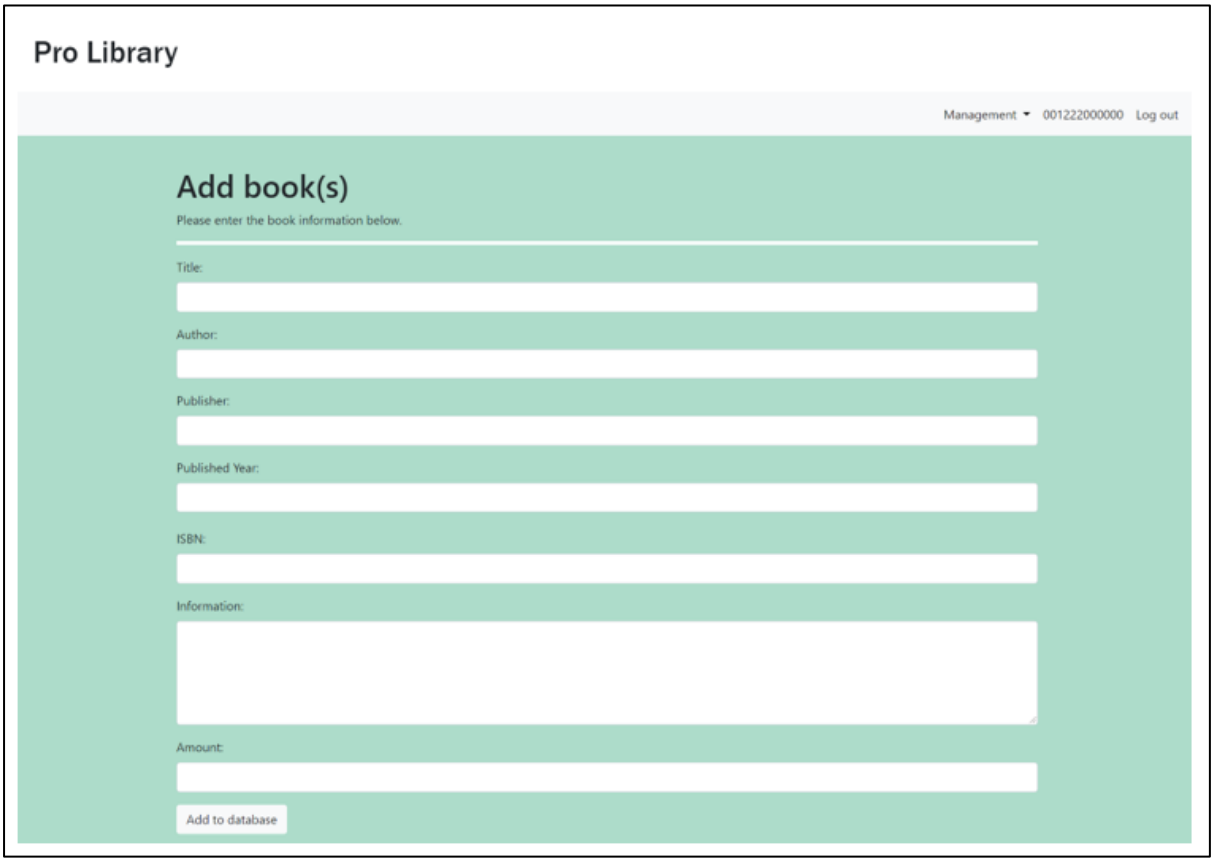
Error handling: When the IC number entered does not exist in the database



Login page - Successful login to user main page

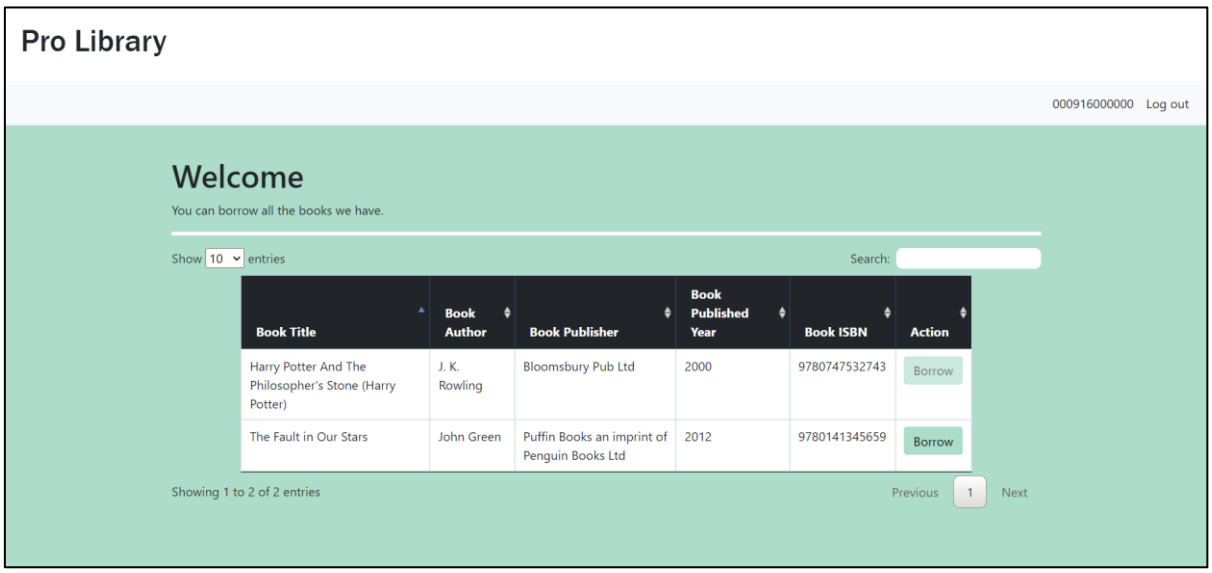


Login page - Successful login to admin main page (Add new books)



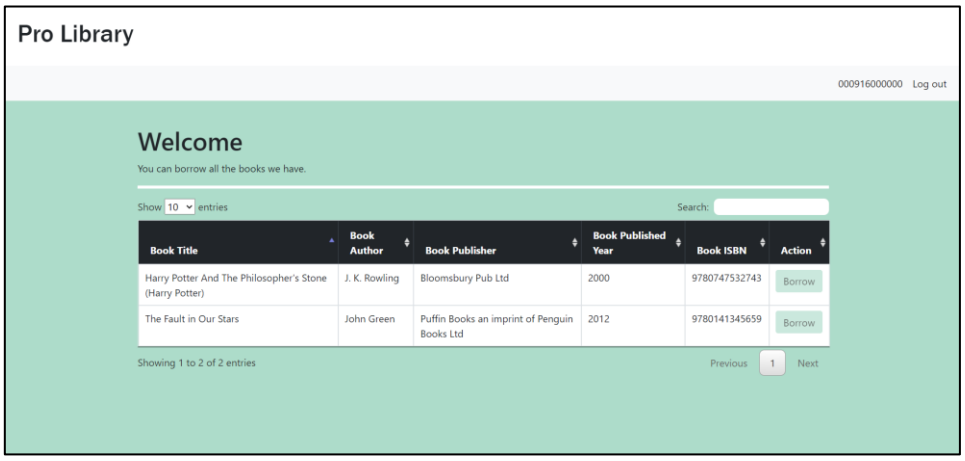
User main page

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



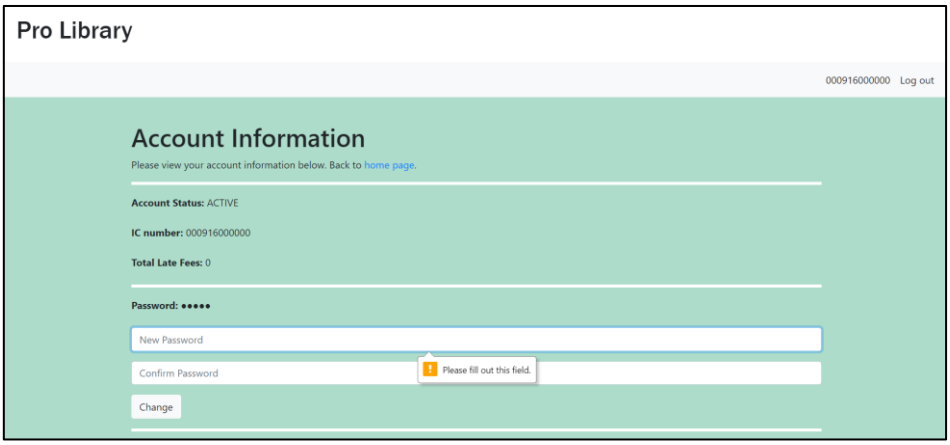
User main page

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



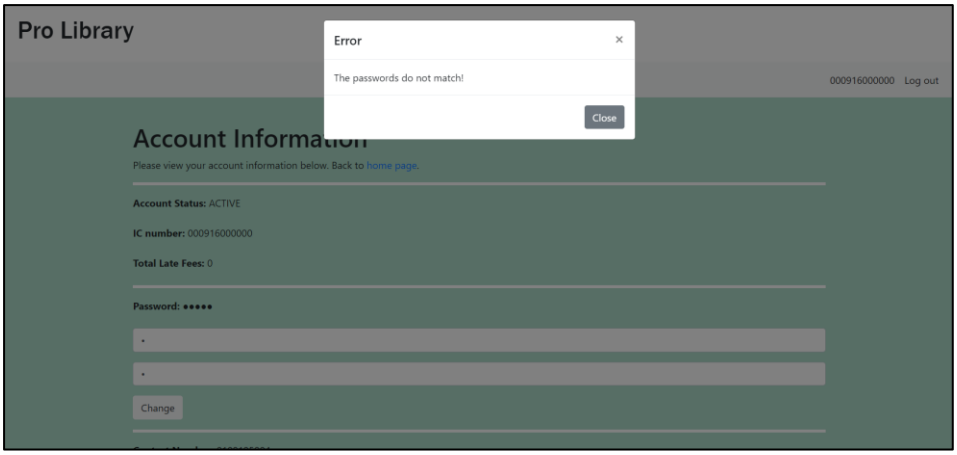
User/Admin view account details

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

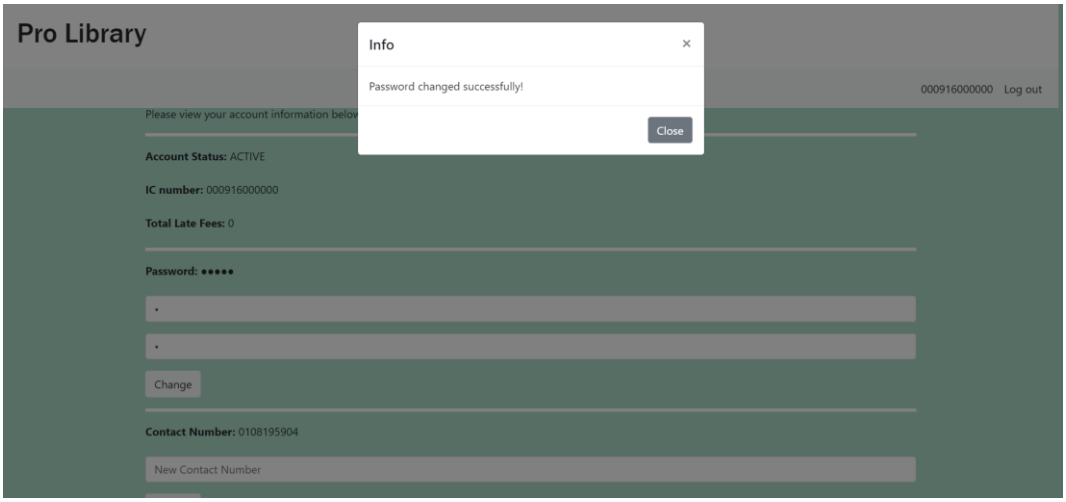


User/Admin view account details

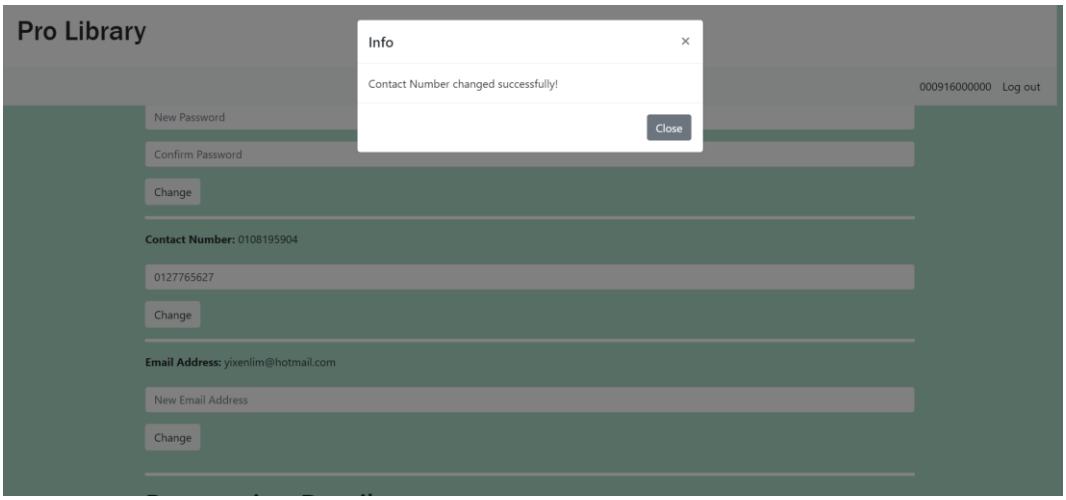
Error handling: When the passwords entered do not match



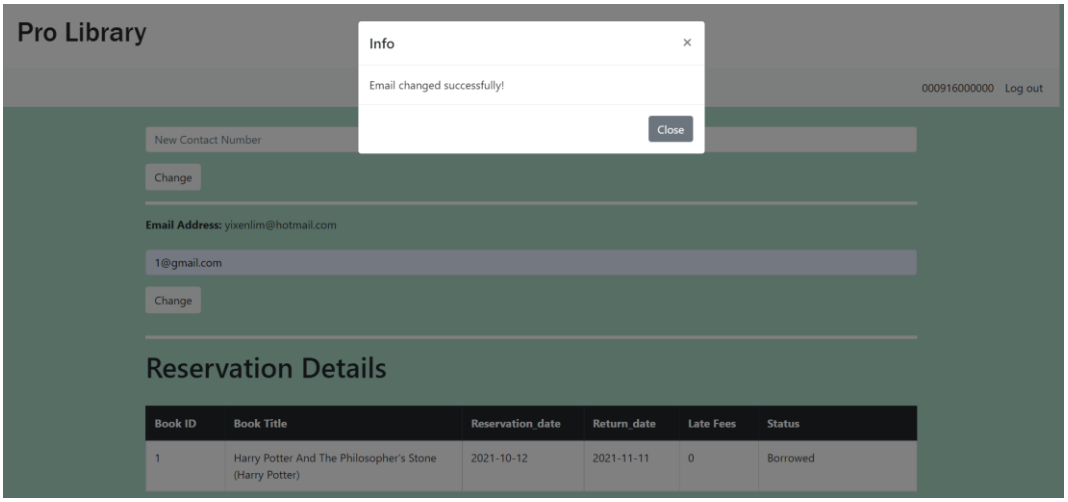
User/Admin view account details – Successfully changed password



User/Admin view account details – Successfully changed contact number

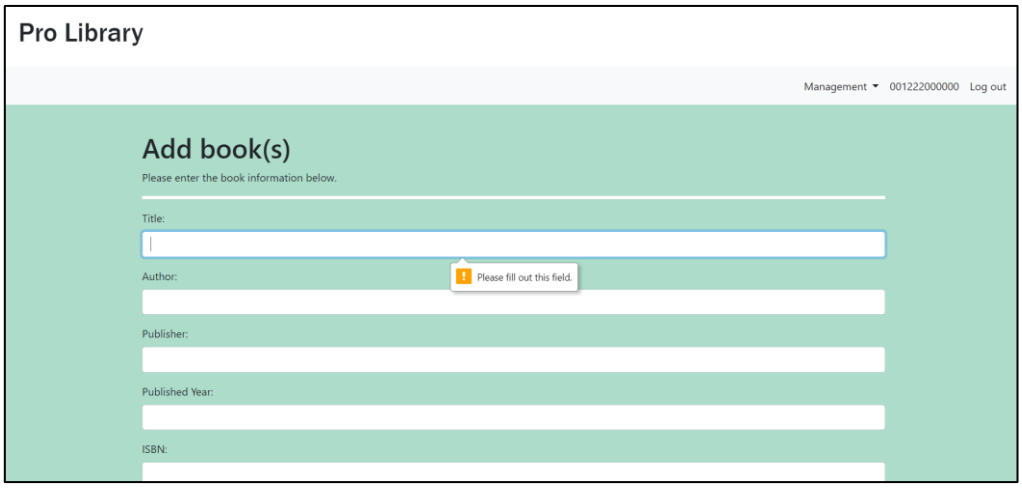


User view account details – Successfully changed email

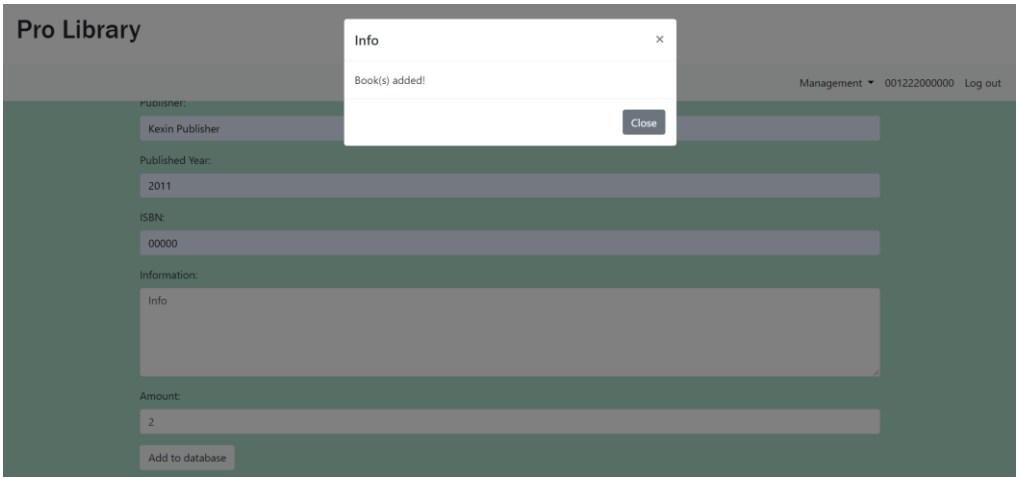


Admin main page (Add new books)

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

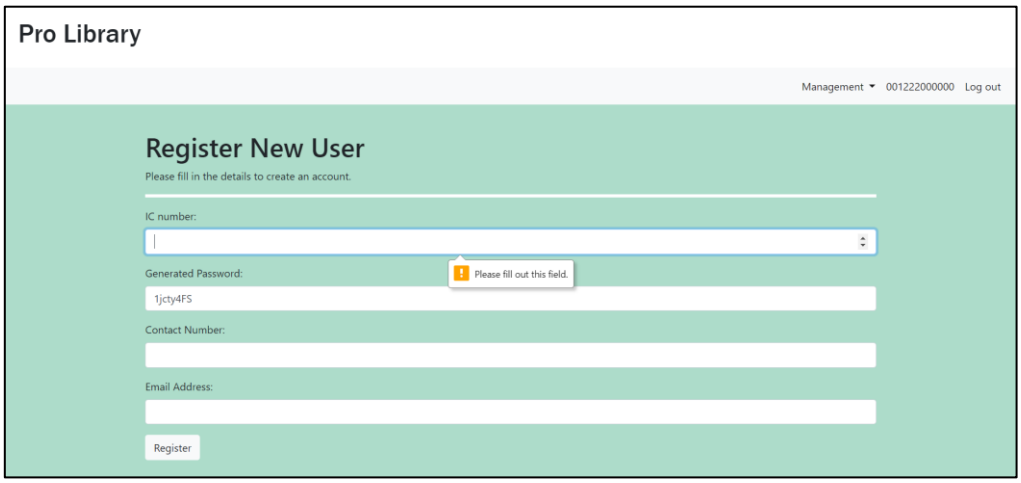


Admin main page (Add new books) – Successfully add books to database



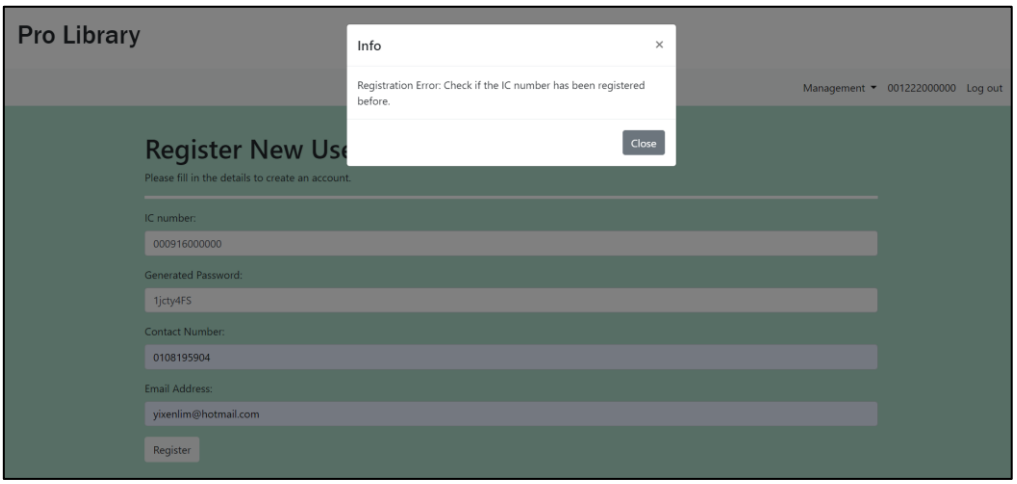
Admin register new user

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

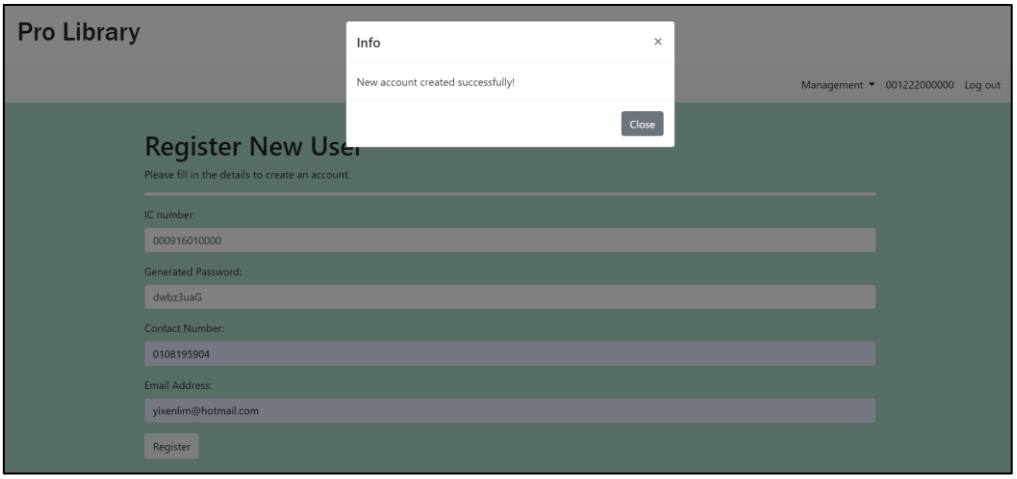


Admin register new user

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



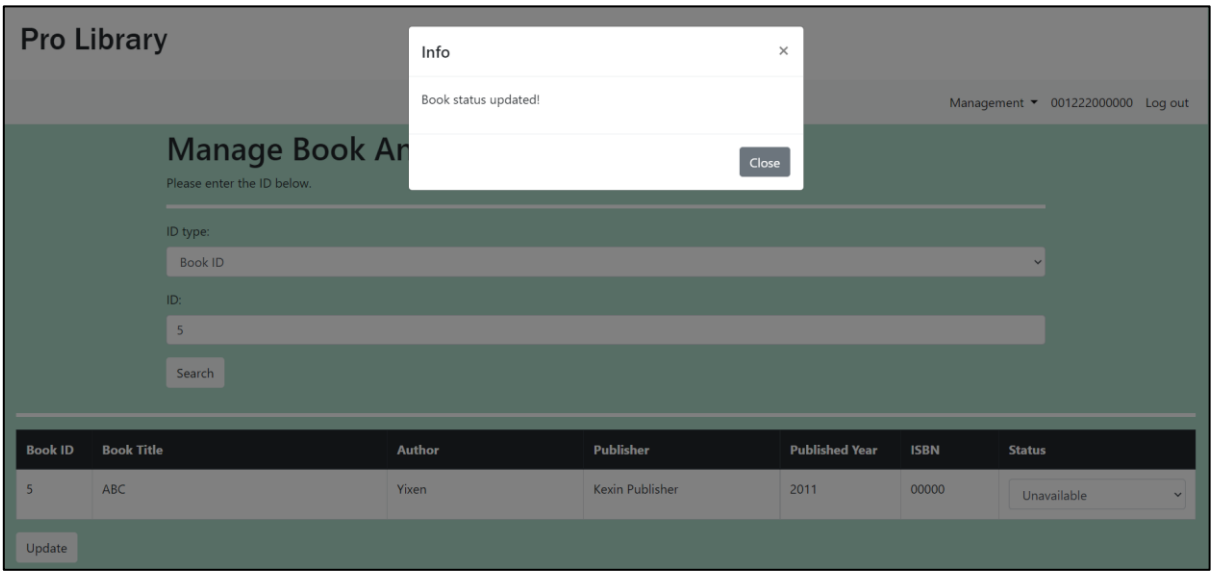
Admin register new user – Successfully registered new user



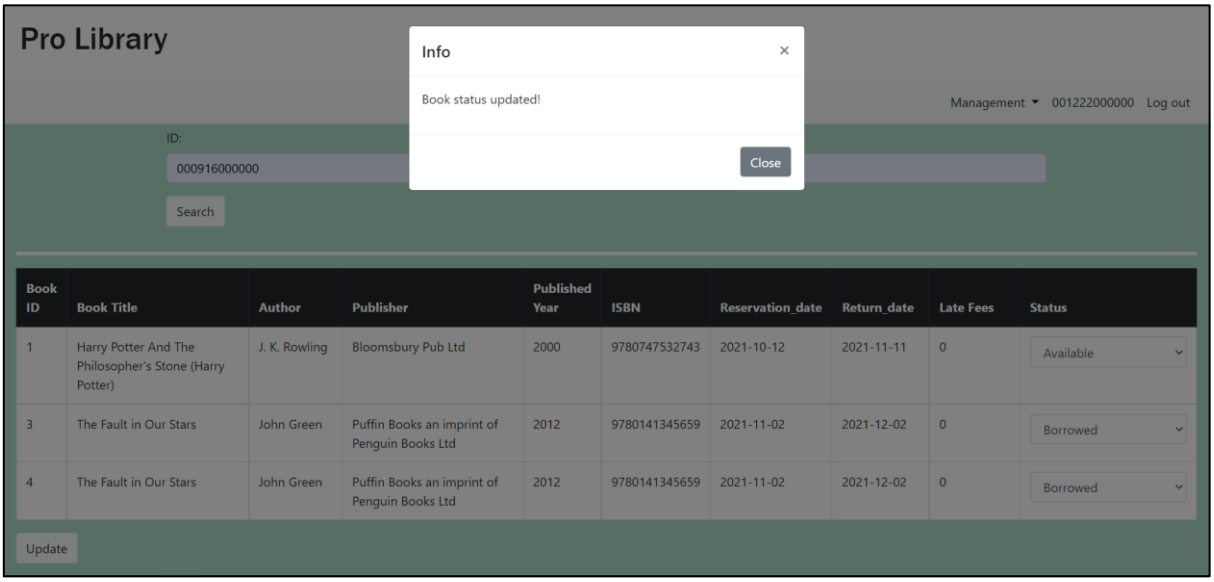
Admin manage book and reservation

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

Admin manage book and reservation – Successfully updated book status

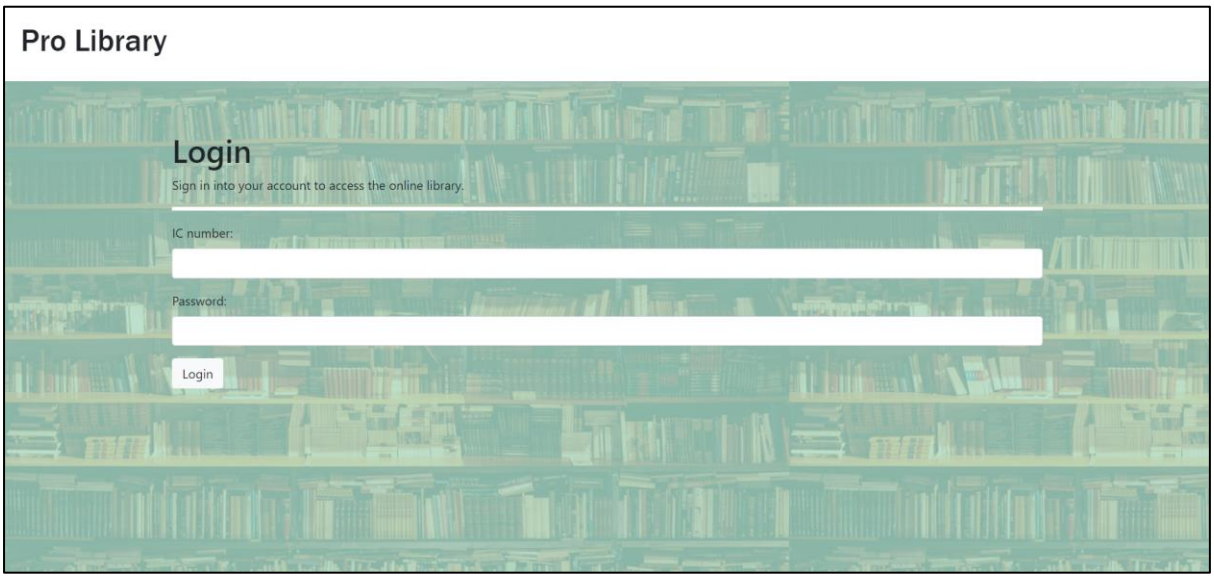


Admin manage book and reservation – Successfully updated reservation

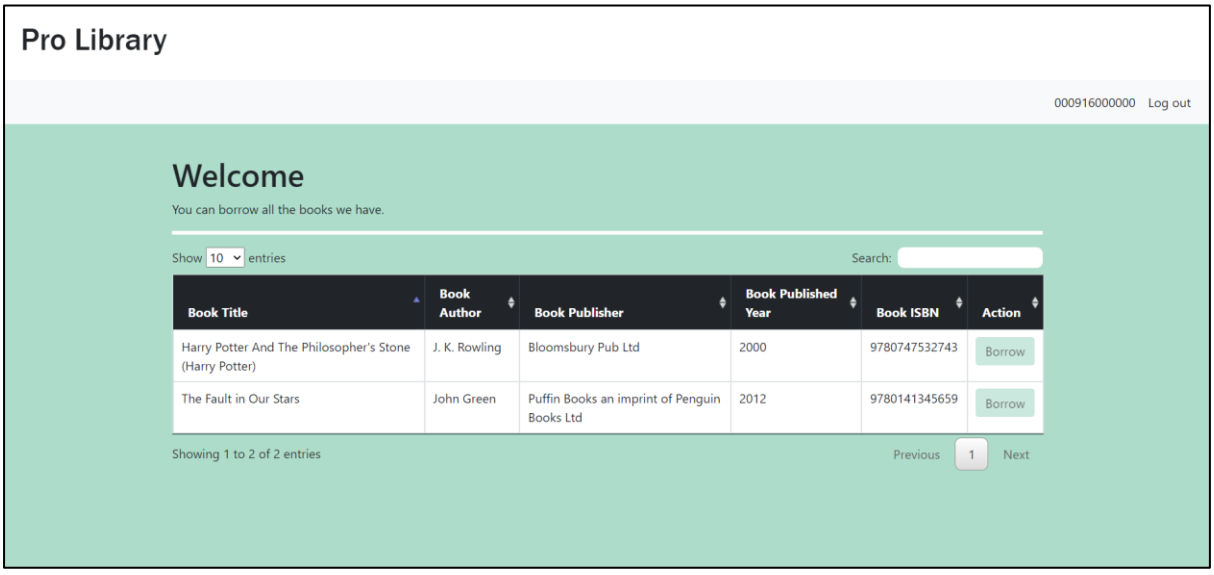


Website Screenshots

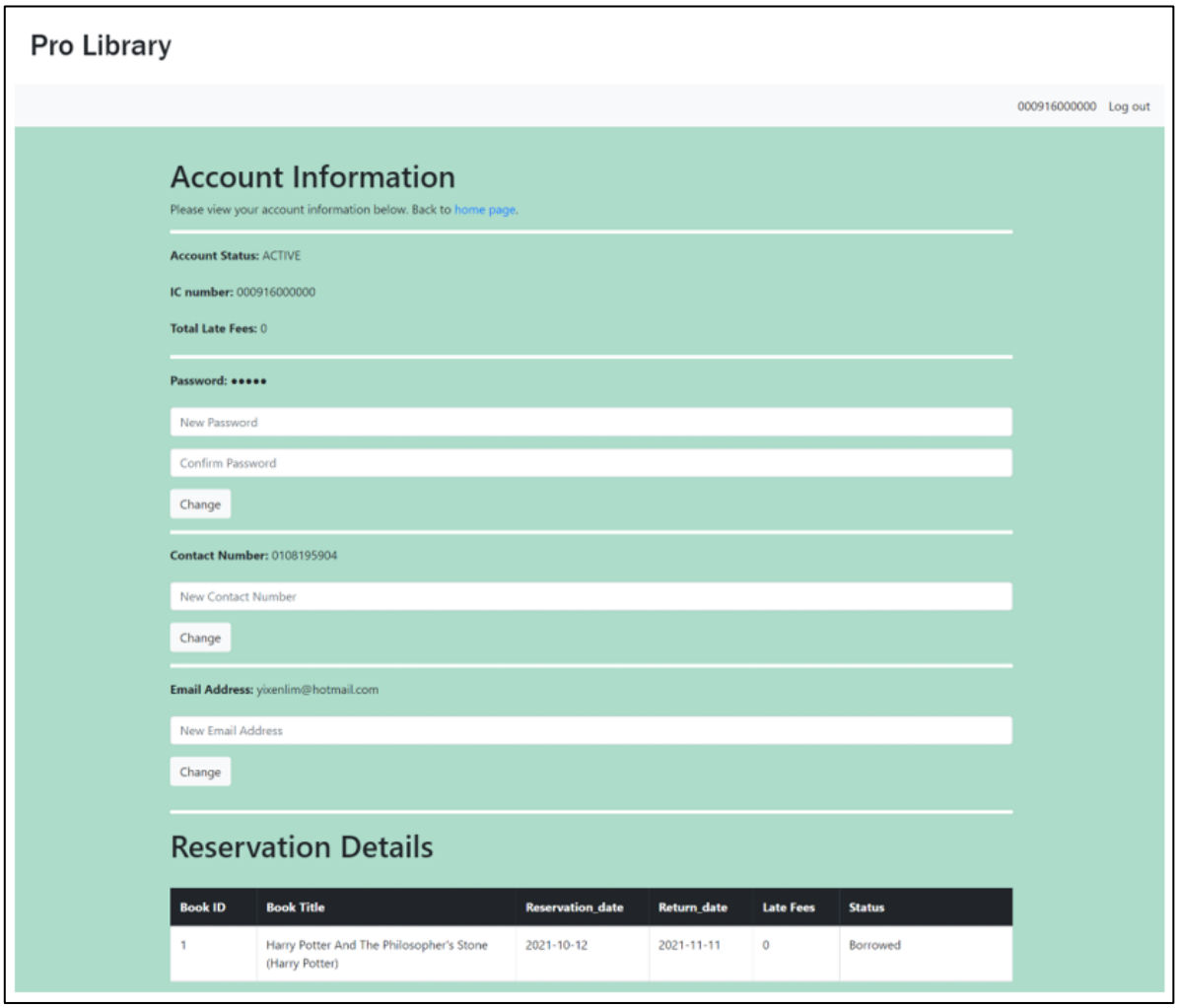
Login



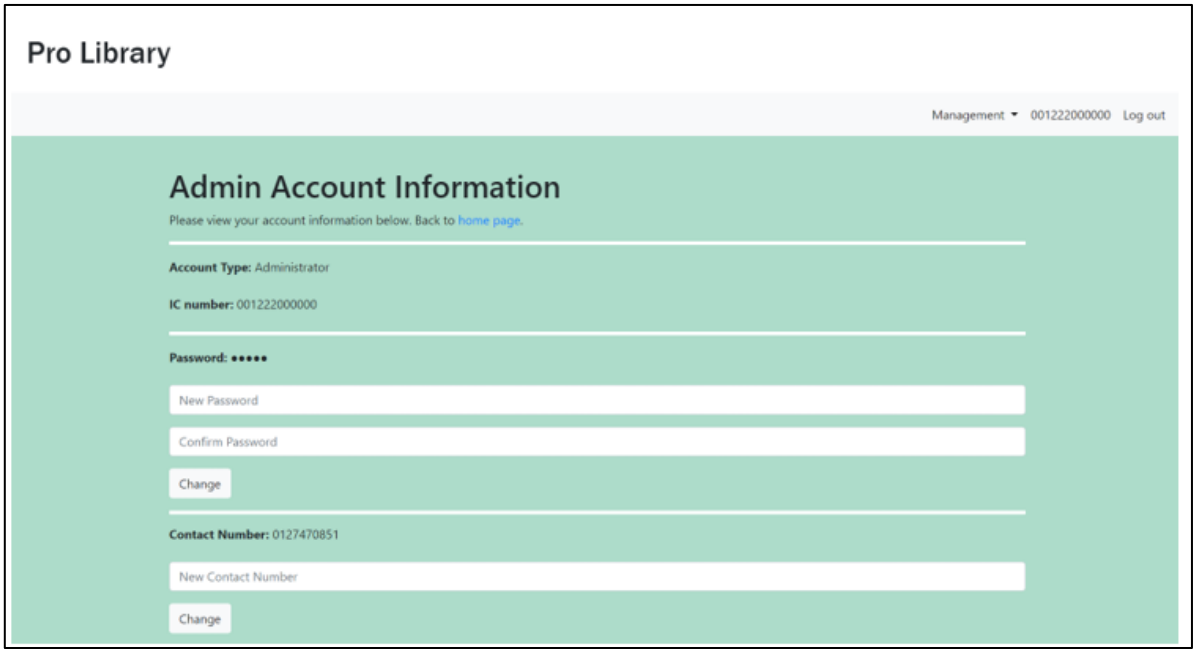
User - main page



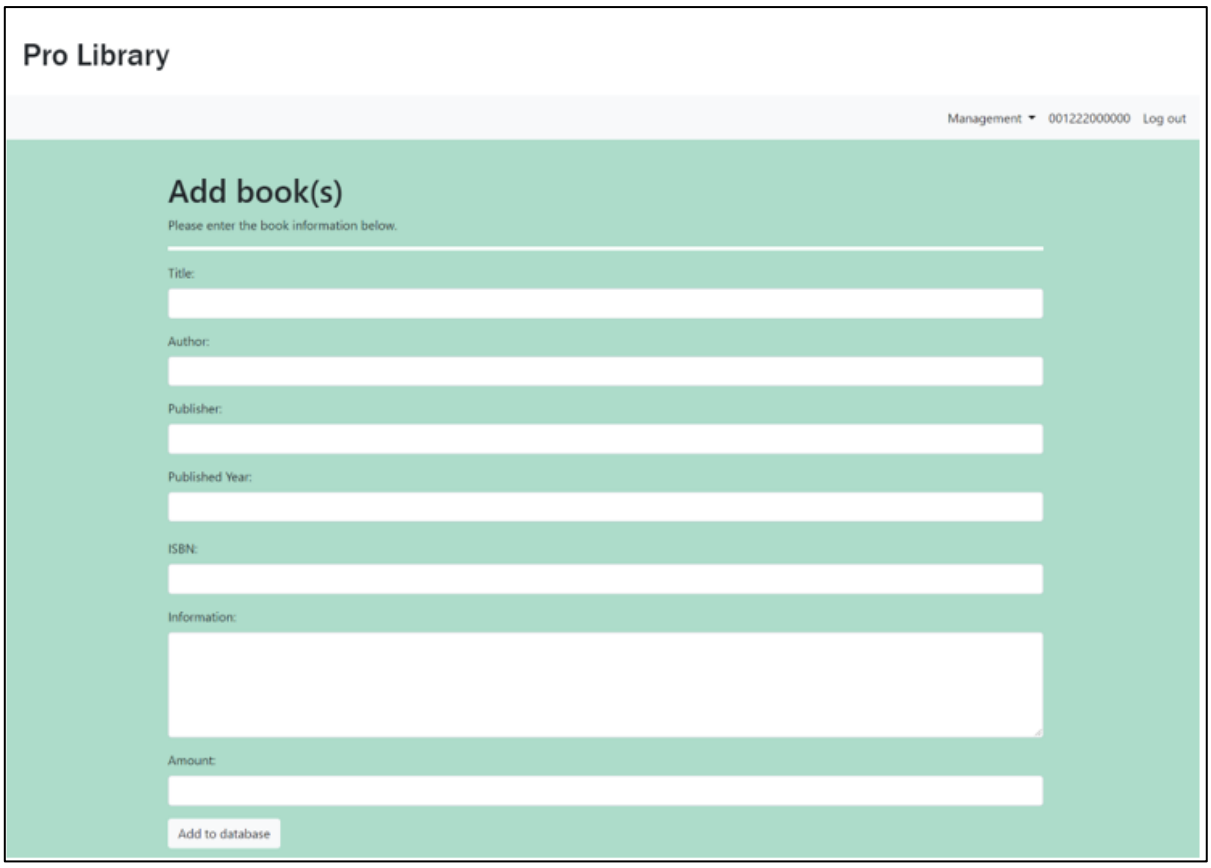
User – View account details



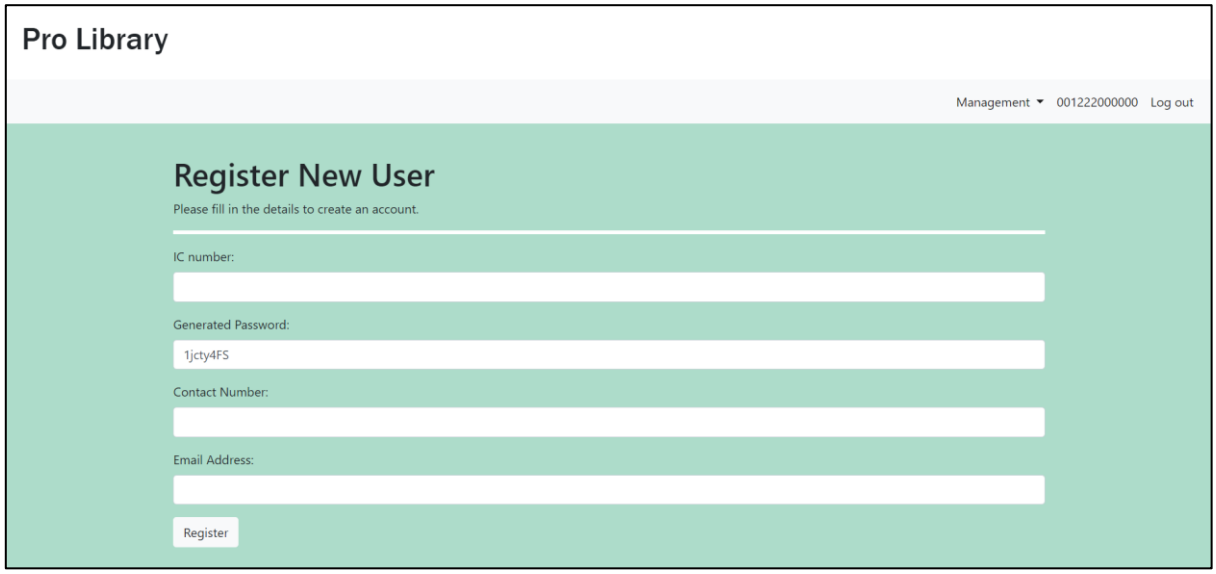
Admin – View account details



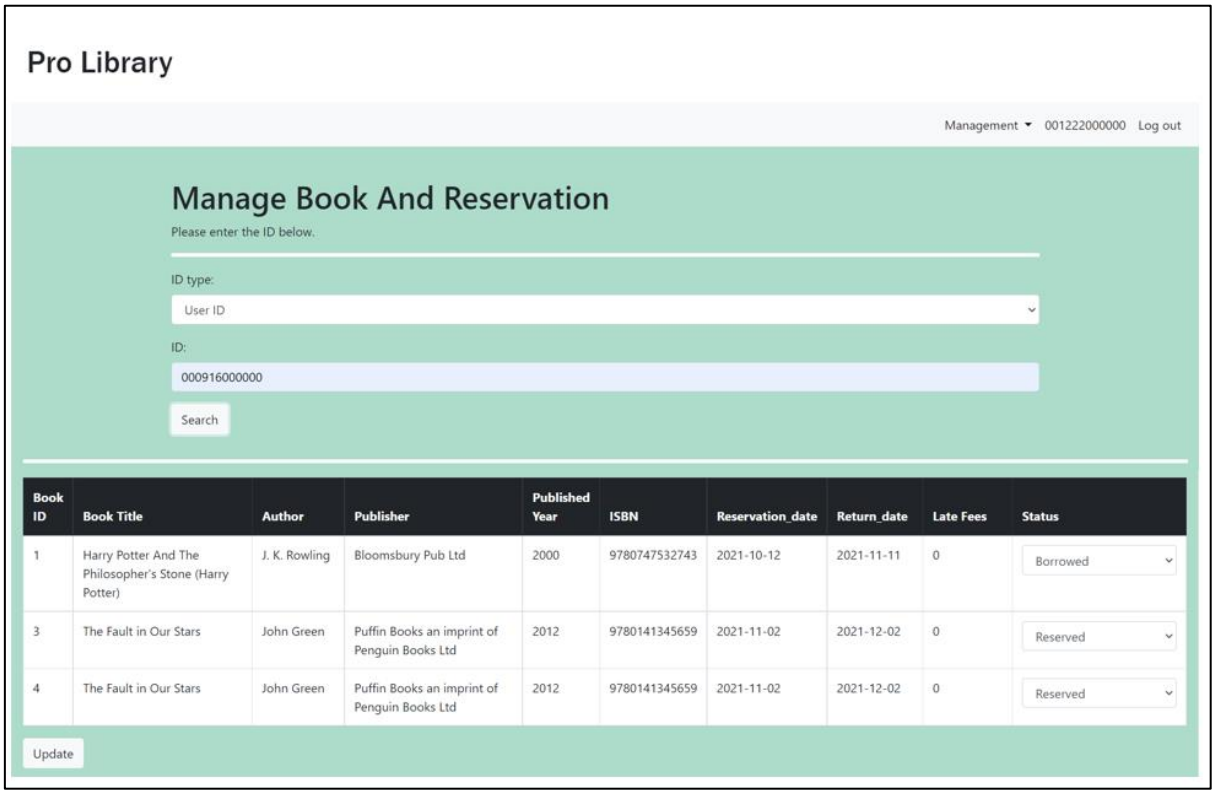
Admin - main page (Add new books)



Admin – Register new user



Admin – Manage book and reservation



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.