

# Library Information System

By Peter, Lewis and John

## Goals and Objective

The team is tasked with creating a library information system which is designed to manage all the in-house functions of a library. This will include basic library activities such as registration of new members and editing existing ones, borrowing, and returning of books, bookkeeping and so on.

## Timeline and Project Constraints

For the first four weeks we are to plan out how we will be tackling this task for the second half of the semester, and design prototypes that will help visualize what the system will look like. By the end of the 4 weeks, we are also required to create a presentation to show the class and essentially pitch our idea before moving on to coding the system.

## Team members and responsibilities

Since we are all mutually proficient in the three areas, front-end, back-end and database, we have decided to take a versatile developer approach.

### *Versatile developer*

- Participate in the design phase, contribute to the UI, back-end and database design.
- Implement front-end components based on the design specifications.
- Conduct thorough testing of the entire system including front-end, back-end, and database components.
- Address and resolve and issues which become prevalent during testing.

### *Responsibilities*

- Ensure each team member know exactly where the progress of the project.
- Conduct testing to ensure that the project is maintained to a high quality before finishing.
- Communicate efficiently to ensure that the project stays on track.

## Software Process models

### The Waterfall Model

For the development of the library information system, we will be using the Waterfall model. This decision is based on the nature and requirements of the project. The Waterfall model is a linear approach where each phase must have been completed before moving on to the next, hence the waterfall name. In the context of a library information system, where the requirements are well-defined and unlikely to change during development, the Waterfall serves as the most practical method in the development of the library information system. Also, the Waterfall model is suitable for good documentation. This approach ensures that the development process is straightforward, and allows for testing at each stage, making it the most suitable choice for the library information system.

## Tools

For keeping track of the work we have to do we will be using [Trello](#). Trello is a popular project management tool which excels in collaboration. Offering customizable workflows, task assignments

and real-time updates, Trello greatly enhances team communication. Trello is versatile and free which makes it the clear choice for a goal tracking, collaboration tool.

For Code collaboration we will be using [GitHub](#). GitHub stands out as a premier platform for software development, allowing for quick collaboration through pull requests, code reviews and issue tracking. Its version control system allows for quick debugging. Along with all the benefits GitHub is also free and the industry standard for code collaboration making this the best choice for a code collaboration software.

For Coding language, we will be using [C#](#). C# is a modern programming language developed by Microsoft, Renowned for being powerful and simple. C# has automatic memory management and a clean syntax that makes it easy to use for both beginners and experienced developers. C# is also an object-oriented programming language which enables developers to make scalable and maintainable software. Along with all these benefits C# is also free to use making it the clear solution to finding the appropriate programming language.

For IDE we will be using [Visual Studio 2019](#). Visual studio 2019 has been industry standard for multiple years. Being developed by Microsoft and having simple to use GitHub features allows for a powerful IDE. C# is also the primary programming language with a lot of useful and seamless integrations. It is also essential that everyone in the team is using the same version as if the versions are different the same code could lead to different results. All these factors along with the IDE being free makes it the perfect IDE for the library information system.

For the Database we will be using [PostgreSQL](#). Postgres is an open-source, free database system which is known for being very powerful. Postgres is essential for programs which need scalability and data integrity. With advanced indexing and a vibrant community, Postgres is well-suited for a wide range of projects, including small applications. These factors contribute to it being the best suited database for the library information system.

For the UI we will be using [WPF](#). Windows presentation foundations is a graphic subsystem developed by Microsoft. Known for its versatility, WPF enable developers to design modern user interfaces. WPF separates the UI from the code which makes creating the UI simple and efficient. Along with all the benefits WPF is free to use. All these benefits make WPF the best UI application for the library information system.

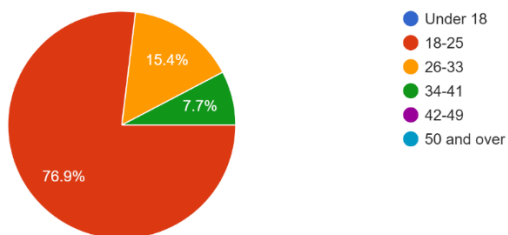
## Requirement gathering

### Assumption of users

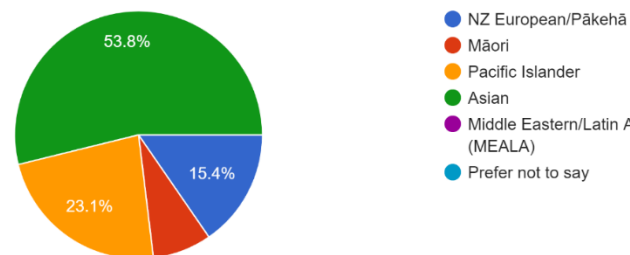
1. Users will frequently borrow books online rather than visiting the physical library.
2. Library users primarily seek books for entertainment rather than academic purposes.
3. Users generally prefer physical books over e-books due to the sensory experience.
4. Users prefer a complex system with many features over a simple and straightforward one.
5. Users find pop-up messages annoying and prefer email notifications for new arrivals.

### Survey (Closed questions)

How old are you?  
13 responses

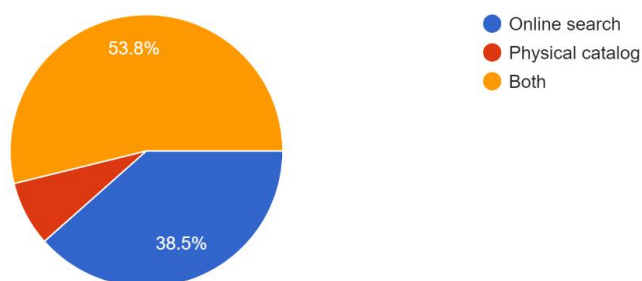


What ethnicity are you?  
13 responses



Our respondents were not dominated by a particular age group, and the ethnic composition moderately reflects New Zealand's demographics. The distribution across age categories indicates a varied representation, with respondents falling into different age brackets. Due to time constraints in the assignment, the survey's scale was limited, resulting in some age groups being represented by a single individual. While the current data provides insight, Book Hoppers launch would require a larger sample size to ensure statistical robustness and minimize the impact of outliers on the findings.

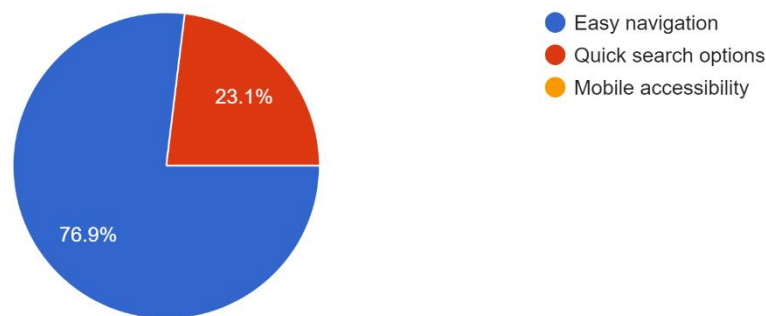
How do you prefer searching for library materials?  
13 responses



Seeing the convenience of online searching, especially amidst the pandemic during 2020-2021, most of our responders have preferred having online access to be part of searching for library materials.

What features do you find most important in an online catalog?

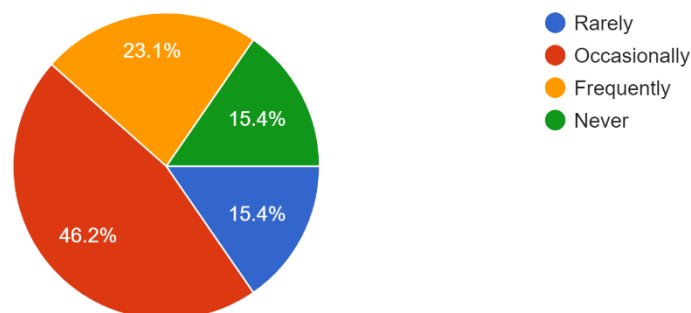
13 responses



The respondents enforce the importance of easy navigation in an online catalogue, with feature having 76.9% of the votes. Quick search options are also recognised as some-what important but not as necessary as easy navigation. Mobile accessibility didn't receive any votes meaning the users wouldn't benefit from it was much as the other two.

How often do you use library resources remotely (outside the library premises) (eg. Go on the library website) ?

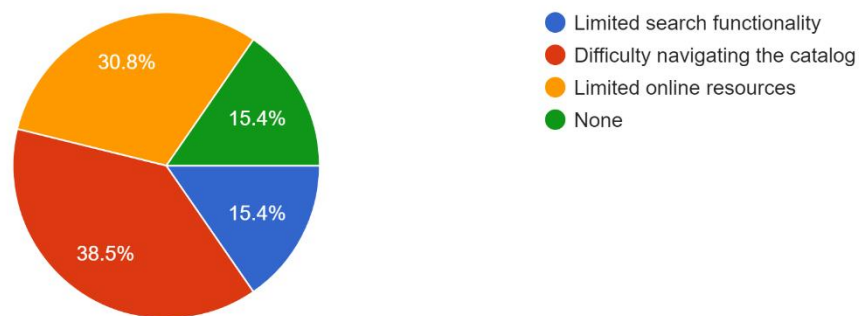
13 responses



The respondents offered a wide variety of responses with a significant proportion having never used a library resource remotely. Although there's respondents in each of the 4 categories the majority is in the "occasionally" section. The diverse range of responses underscore the importance of providing accessible and convenient remote access option for library services.

### What challenges, if any, do you face in accessing library resources?

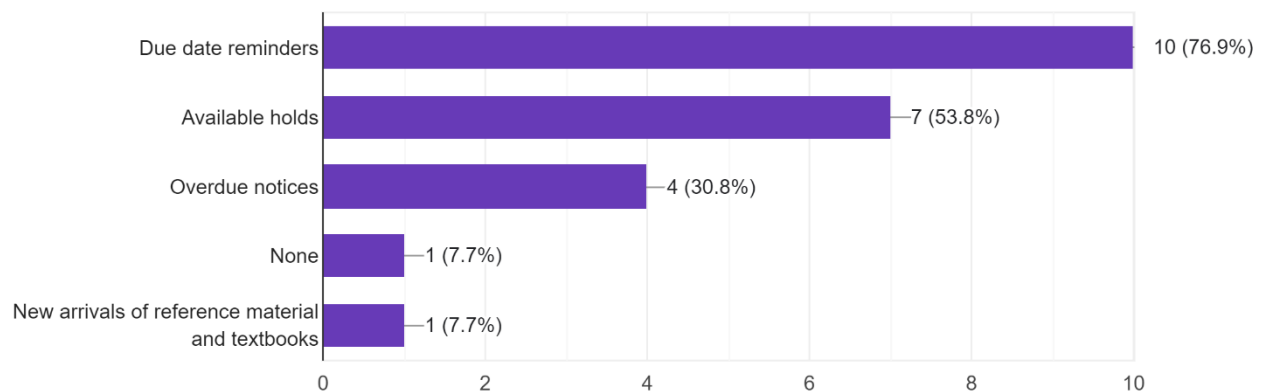
13 responses



The question reveals that the respondent's face challenges in accessing library resources, with a predominant issue being difficulty navigation the catalogue. Additionally, a notable concern is the limited availability of online resources and search functionality. While some participants reported no challenges, the majority of respondent had issues accessing library resources.

### Which types of notifications would you like to receive from the library system?

13 responses



The respondent's prefer receiving notification from the library system primarily for due dates reminders and information about available holds. While a significant number expressed interest in overdue notices, there's a range of preferences, including a respondent suggesting that they would like to receive a notification about new arrivals. While most participants wanted notification one of the participants voted no meaning there needs to be a button which disables all notifications.

Any specific improvements you would like to see in the library information system?

4 responses

Personally, I would like to see the navigation bar regarding the genre or research topics that is stored in the library system for easier navigating any book genre, then i like to see the availability of the books once it was searched in your engine but in some case, the system doesn't have that book, so maybe suggestion location of that book might help me find a book that i like to read.

Not much

recommended books in categories

Easy to copy citations. A way to divide pdf books that requires payment and pdf books that are free to use.

With this part of the survey, the “easy to copy citations” caught my eye the most. A lot of students come to libraries to look for references for their research papers, which is something I believe a lot of people needed to do to finish school, and having citations easy to understand and copy would be a huge plus. However, seeing the requirements stated in the assessment, we may need to implement this later after the essentials as this is just a good-to-have, not a must-have.

#### Survey analysis

The survey yielded 13 responses in three days, potentially introducing biases toward Asian and similar-age demographics. Due to limited scale and time constraints, the survey ended up having age groups represented by a single individual. A larger sample size will be necessary for the Book Hoppers launch. Respondents also overwhelmingly preferred online access for library material searches, emphasizing the importance of easy navigation in an online catalogue. Challenges which will be looked upon is difficulty navigating the catalogue and limited online resources. The most important notification to feature is of due dates with only one respondent saying they preferred no notifications. Notably, A respondent expressed a keen interest in an “easy to cop citations” feature, seen as beneficial for student research papers.

#### Interview Questions (open ended)

We asked a couple respondents more questions about using similar apps. This helped us understand what makes a good library information system.

Question 1: What technical requirements are the most important to you in terms of a library information system?

Most respondents had varied preferences for technical requirements. Some of the users stated how they had outdated devices and would like if the library information system required low specs and smaller file sizes. But most of the respondents liked the idea of fast load times.

Question 2: In your Opinion what makes for a good login system (e.g., username and password, pin)

Most of the respondents like the idea of username and password rather than pin. Although this was the case a couple of the respondents suggested making email and password instead, because they can always remember their emails. One of the respondents said they would like both Email and

password and, username and password. This suggestion seems like the best option as it combines the best of both worlds.

Question 3: How crucial is data privacy and security to you? And what specific measures would you like to see implemented?

The respondents had varying answers as to what specific measures they would like to be taken but all agreed on data privacy and security being very crucial. Some respondents talked about encryption when asked what measures they wanted to see implemented. They also would like features to control the visibility of their borrowing history to ensure that their book check outs were kept private. Another way of security which was suggested by one of the respondents was to add an authentication code to the email to ensure the person who has access to the email can login to that account. Most of these changes will be hard to implement in the first iteration but at a full-scale release will be considered a bare minimum.

#### Assumption revision

1. Users will appreciate the convenience of borrowing books online but may also visit the physical library for certain preferences or needs.
2. Library users have a balanced interest in both academic and entertainment-related books.
3. Users prefer both physical books and e-books, and their choice depends on the nature of the content and personal preference.
4. Users prefer an intuitively designed system that is user-friendly, allowing for quick communication and efficient authorization processes.
5. Users appreciate notifications for new arrivals and popular books but prefer non-intrusive methods like email notifications rather than pop-up messages.

After conducting the interviews and surveys we decided to revise our assumption of which only one of them changed. The one that changed was that some users still prefer to visit the physical library than search for a book online. This was made apparent through our survey question which questioned if people would rather be going to the physical location or not.

#### Requirements

##### *Functional requirements*

1. **Login System** – Admins and members should be able to enter their username and password in to enter the application.
2. **Admin Controls** – The admin should be able to view both the library's catalogue and member's info, which will both be in different databases.
3. **Admin edit catalogue** – The admin should be able to add new books to the catalogue, entering its information within the application, and be able to edit existing book's info. This will include its title, author, and date of publish.
4. **Admin edit members** – The admin should also be able to register new members to the application, entering their information such as first name, last name, and age and be able to edit existing member's information if needed be.
5. **System "due-date" logs** – The system should add a book to the database of "borrowed books" along with the book's due date, and a log message for the admins to be informed when it should be returned.
6. **System "due-date" logs** – The system should scan the database of "borrowed books" for books that are "overdue" and log a message for the admins to see and inform the member that borrowed it.

7. **Catalogue View** – Members should be able to see the books in the catalogue, as well as if it is available to be hired out or someone has reserved it, or if it is being hired out.
8. **Book Bookings** – Members should be able to hire a book from the application before coming into the library, and the system should be able to reserve the book so no one else will be seeing it as available.
9. **System “returned” logs** – The system should edit the database of “Borrowed books” and look for the “returned” books and remove it from the database and send a message for the admins that it has been returned.

### Non-functional requirements

1. **Performance** – The user should be able to perform their desired action in a fast and hasty time.
2. **Security** – The user should feel safe that their password and other personal information isn't leaked or shown to anyone.
3. **Accessibility** – The system should have a GUI which is very easy to follow for new users.
4. **Reliability** – The system should be highly reliable, making sure it has minimal downtime for maintenance or unexpected issues.

### Validation Table

For this part, we were tasked to create a validation table for our system, where we list down our system's required features, and our tutor will validate said requirements if the feature is a priority.

Requirement ID	Requirement Description	Is Clear and Unambiguous ?	Is Complete ?	Is Consistent ?	Feasible?	Comments
RQ -1	<b>Login System</b> - Admins and Members should be able to put their username and password in to enter the application	Yes	Yes	Yes	Yes	Ok - please ensure checks for duplicate users while registering are taken care of
RQ -2	<b>Admin Controls</b> - The admin should be able to view both the library's catalogue and members' info, which will both be in different databases	Yes	Yes	Yes	Yes	This is a must have
RQ -3	<b>Admin edit catalogue</b> - The admin should be able to add new books to the catalogue, entering its information within the application, and be able to edit existing books' info. This will include its Title, Author, and Date of Publish.	Yes	Yes	Yes	Yes	This is one of the first functionalities to implement on the admin side after the user login and registration are done
RQ -4	<b>Admin edit members</b> - The admin should also be able to register new members to the application, entering their information such as First Name, Last Name, and Age (possibly their date of birth instead) and be able to edit existing members' information if needed	Yes	Yes	Yes	Yes	This is another must have
RQ -5	<b>System "due-date" logs</b> - The system should add a book to the database of "borrowed books" along with the book's due date, and log a message for the admins to be informed when it should be returned	Yes	Yes	Yes	Yes	Must generate a list based on database entries and show that list to be viewable on screen
RQ -6	<b>System "overdue" logs</b> - The system should scan the database of "borrowed books" for books that are "overdue" and log a message for the admins to see and inform the member that borrowed it	Yes	Yes	Yes	Yes	As above
RQ -7	<b>Catalogue View</b> - Members should be able to see the books in the catalogue, as well as if it is available to be hired out or someone has reserved it, or if it is being hired out	Yes	Yes	Yes	Yes	This is a must have
RQ -8	<b>Book Bookings</b> - Members should be able to hire a book from the application before coming into the library, and the system should be able to reserve the book so no one else will be seeing it as available	Yes	Yes	Yes	Yes	This is a must have
RQ -9	<b>System "Returned" logs</b> - The system should edit the database of "borrowed books" and look for the "returned" books and remove it from the database, and send a message for the admins that it has been returned.	Yes	Yes	Yes	Maybe	Do this when all the others above are done.
Signature Client		A. J. Lewis				
Signature Developers		JM Brillante				

### User Personas

With our survey done, we have personified our audience through 3 different people. These personas will help us pinpoint what our system will need to prioritize.

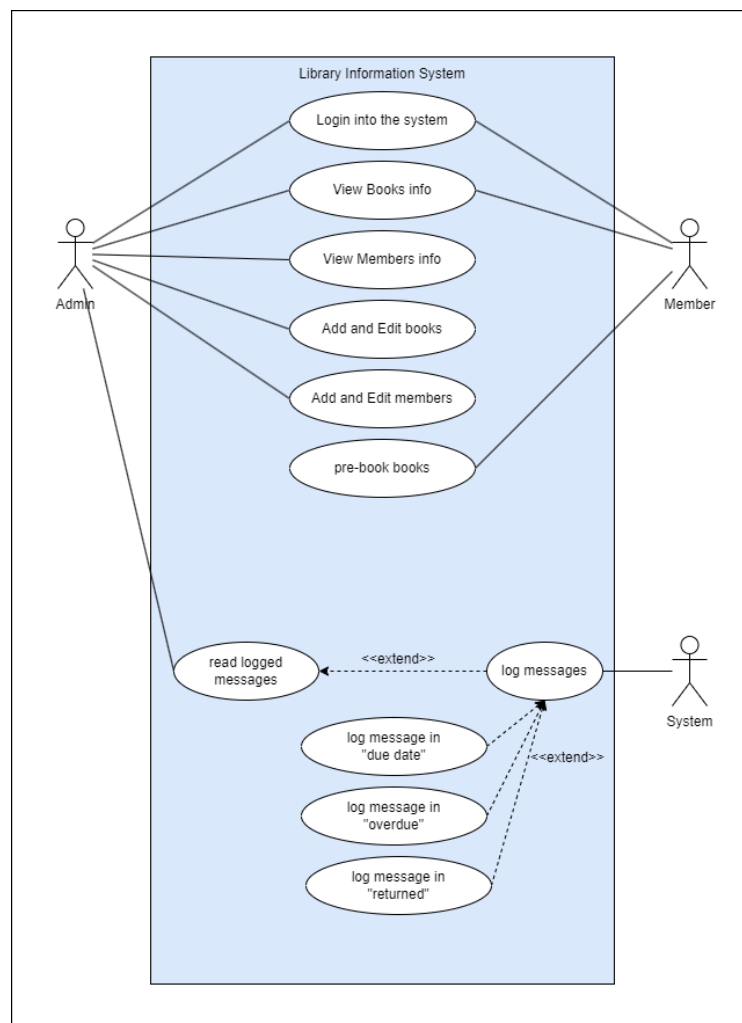


<b>Name</b>	Larry
<b>Age</b>	24
<b>Objective</b>	Larry is a part of a research group exploring the effect of the recent Covid-19 pandemic to the population's dependence on online tools. He was tasked by his research groupmates to look for reviews of related literature that will add more insight and information to their topic.
<b>Challenges</b>	He has a certain topic in mind: the rise of internet but does not know how to look for it in a physical library catalogue, so he tries and look for an alternative.

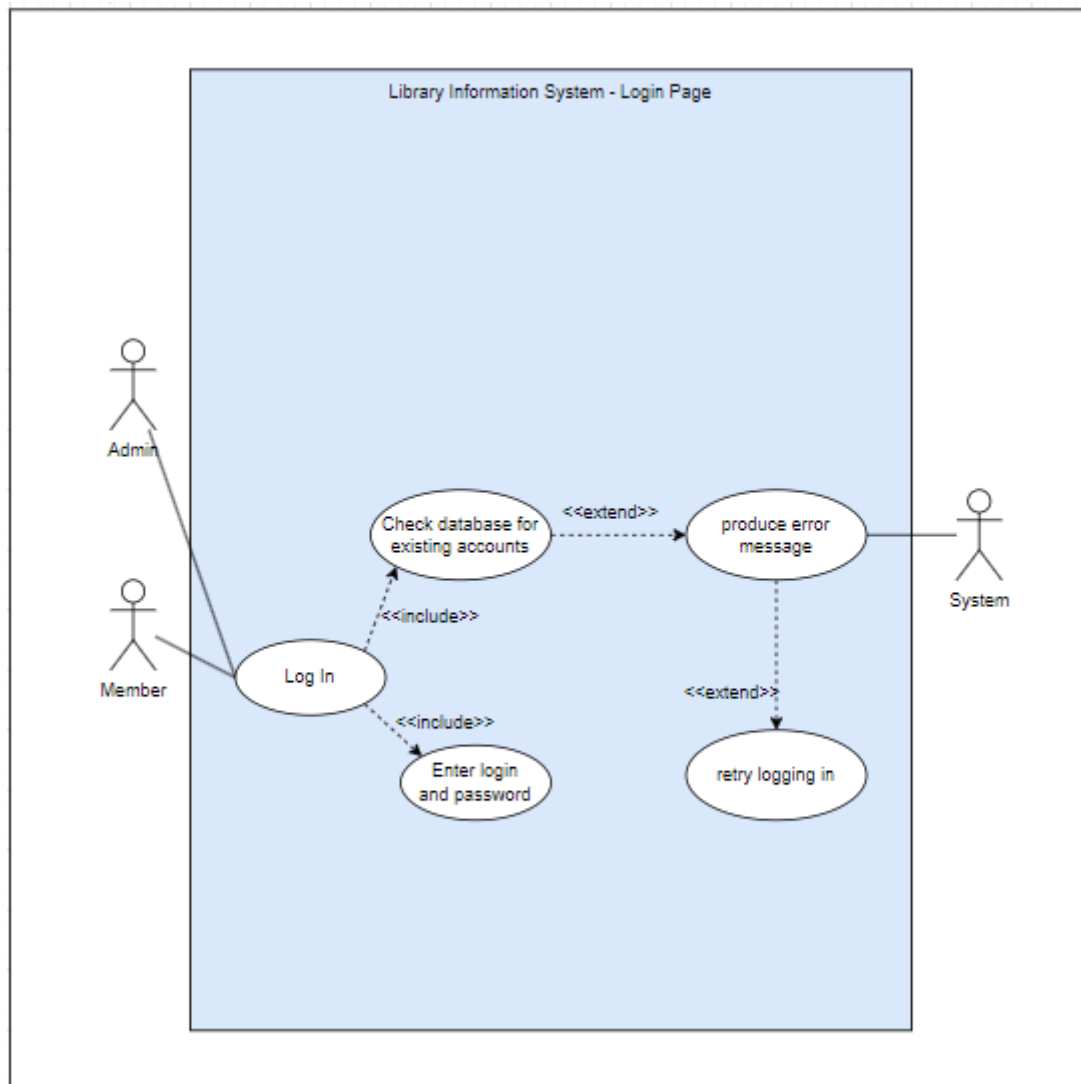
<b>Name</b>	Grace
<b>Age</b>	45
<b>Objective</b>	Grace is a mother of two teenage children who are avid readers. She is looking for a way to find age-appropriate books for her two kids to continue their love for reading. Grace is not that tech-savvy and prefers to just go to a library when searching for books.
<b>Challenges</b>	Grace is unfamiliar with digital library system and online search tools. She may have a bit of trouble with navigating through a library information system. She might also find it challenging to find an age-appropriate book for her kids.

<b>Name</b>	Alex
<b>Age</b>	32
<b>Objective</b>	Alex is a graphic designer who recently made it his new year's resolution to read more books rather than his usual graphic design books. He wants to find some books which inspire creativity and incorporate images into storytelling. Alex wants quick access to information and like to use both physical and digital resources.
<b>Challenges</b>	Alex usually is pressed for time due to his work. He needs a library information system that can efficiently guide him to helpful books he wants to read. If the system he is using is too complicated or time-consuming, Alex may abandon looking all together, missing out on the unique offerings of the library.

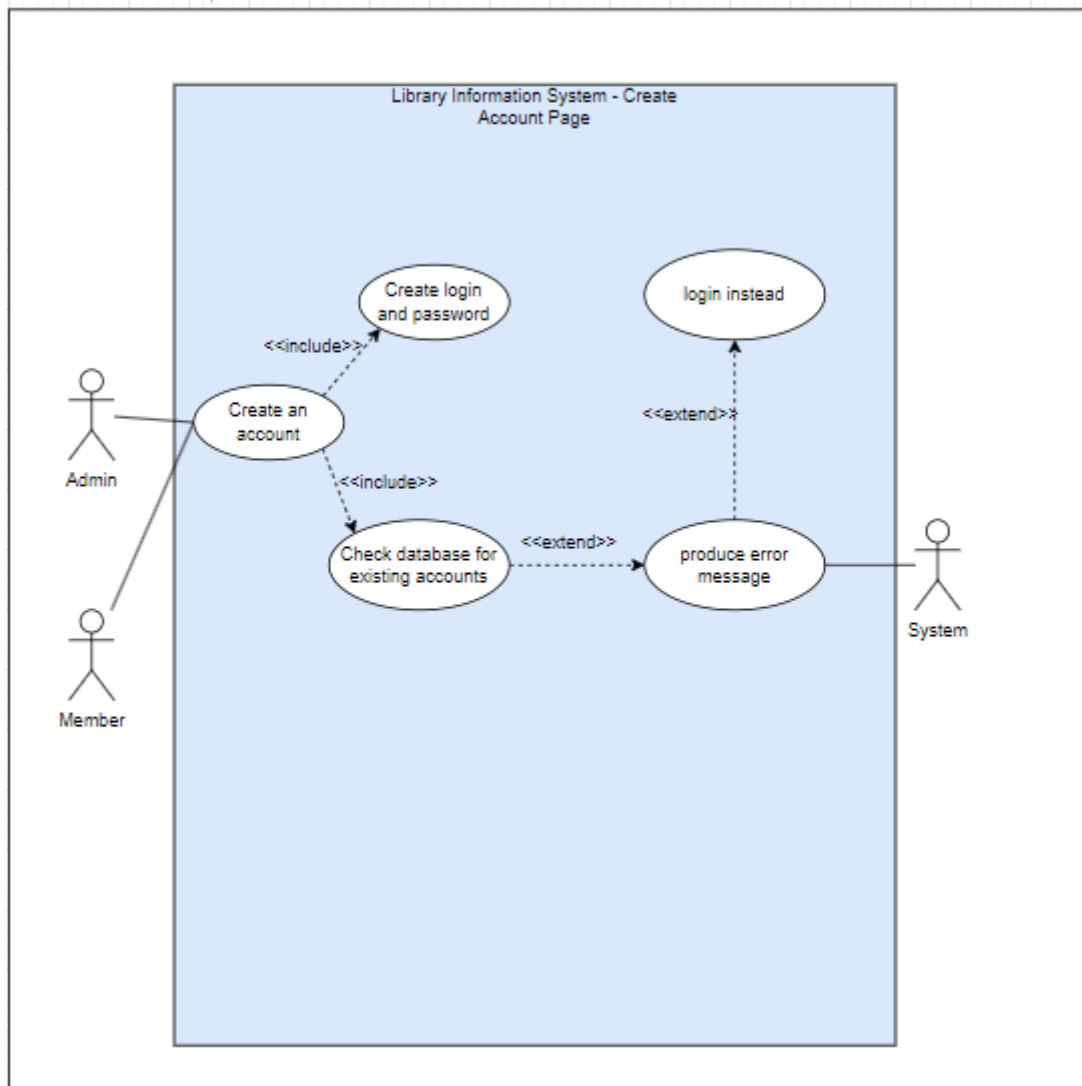
## Use Case Diagrams



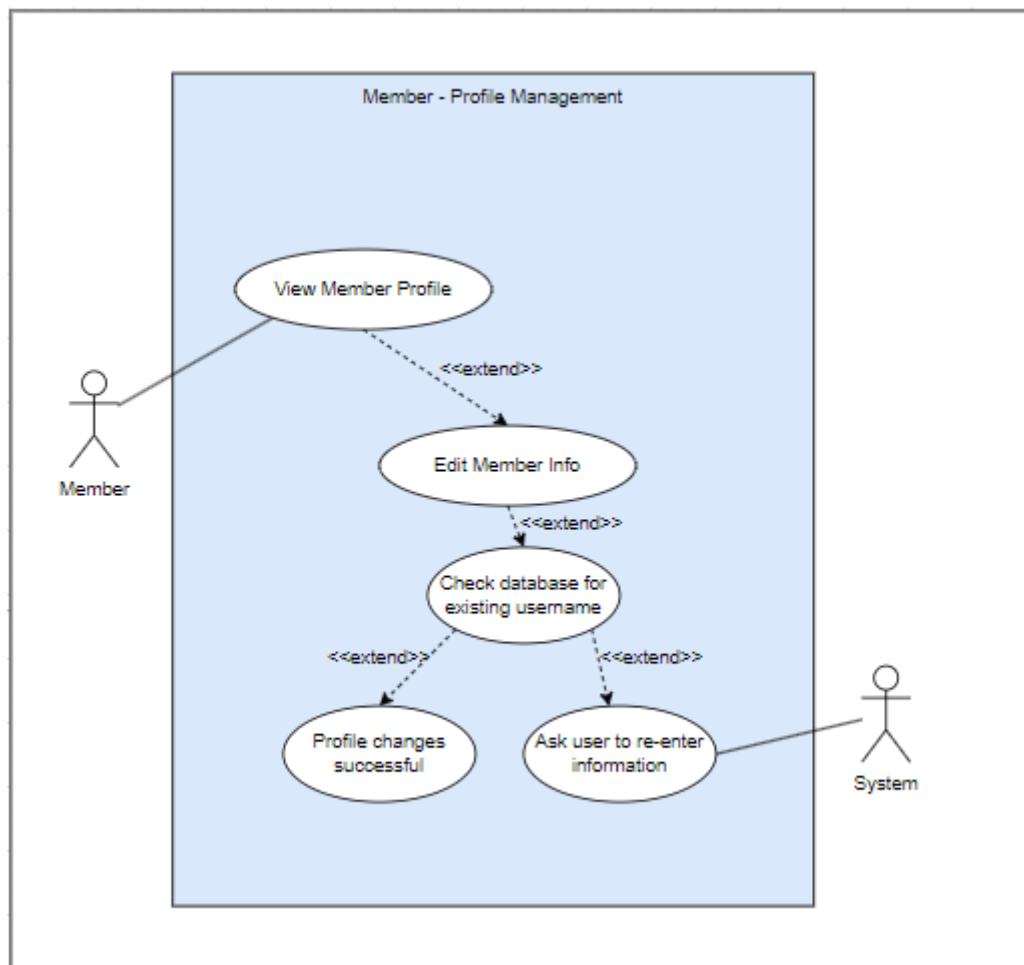
Name	Library Information System
Actors	Members, Administrators, System
Description	It shows how the whole system will work
Pre-Condition	-
Post Condition	-
Actions	<ol style="list-style-type: none"> <li>1. Admin logs in to the system</li> <li>2. Admin sees the library catalogue and book information</li> <li>3. Admin sees the Members list and information</li> <li>4. Admin can edit or create new members</li> <li>5. Admin can edit or add new books to the catalogue</li> <li>6. Member will login or create an account</li> <li>7. Member will see the catalogue</li> <li>8. Members will reserve a book</li> </ol>
Exceptions	-



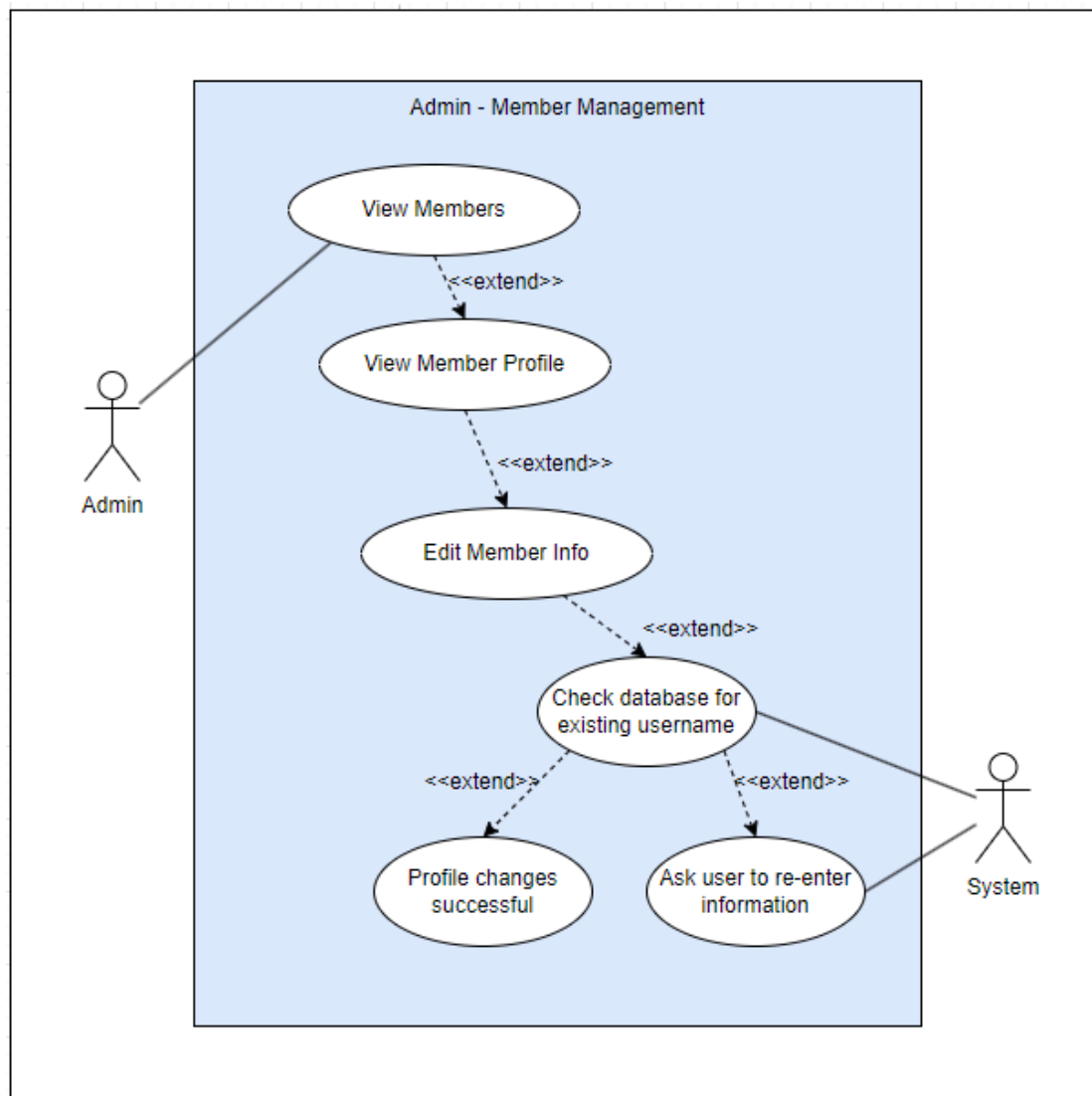
Name	Login Page
Actors	Administrator, Member, System
Description	This use case diagram is to demonstrate how the login page works
Pre-Condition	Administrator must have an existing account
Post Condition	-
Actions	1. Member or admin click on "log in" 2. System will ask the user to enter username and password 3. System will check the database if the account exists 4. If successful, the user gets through
Exceptions	Errors will be thrown if the user: a. Exists in the database but has inputted the wrong password b. Logs in but the username does not exist



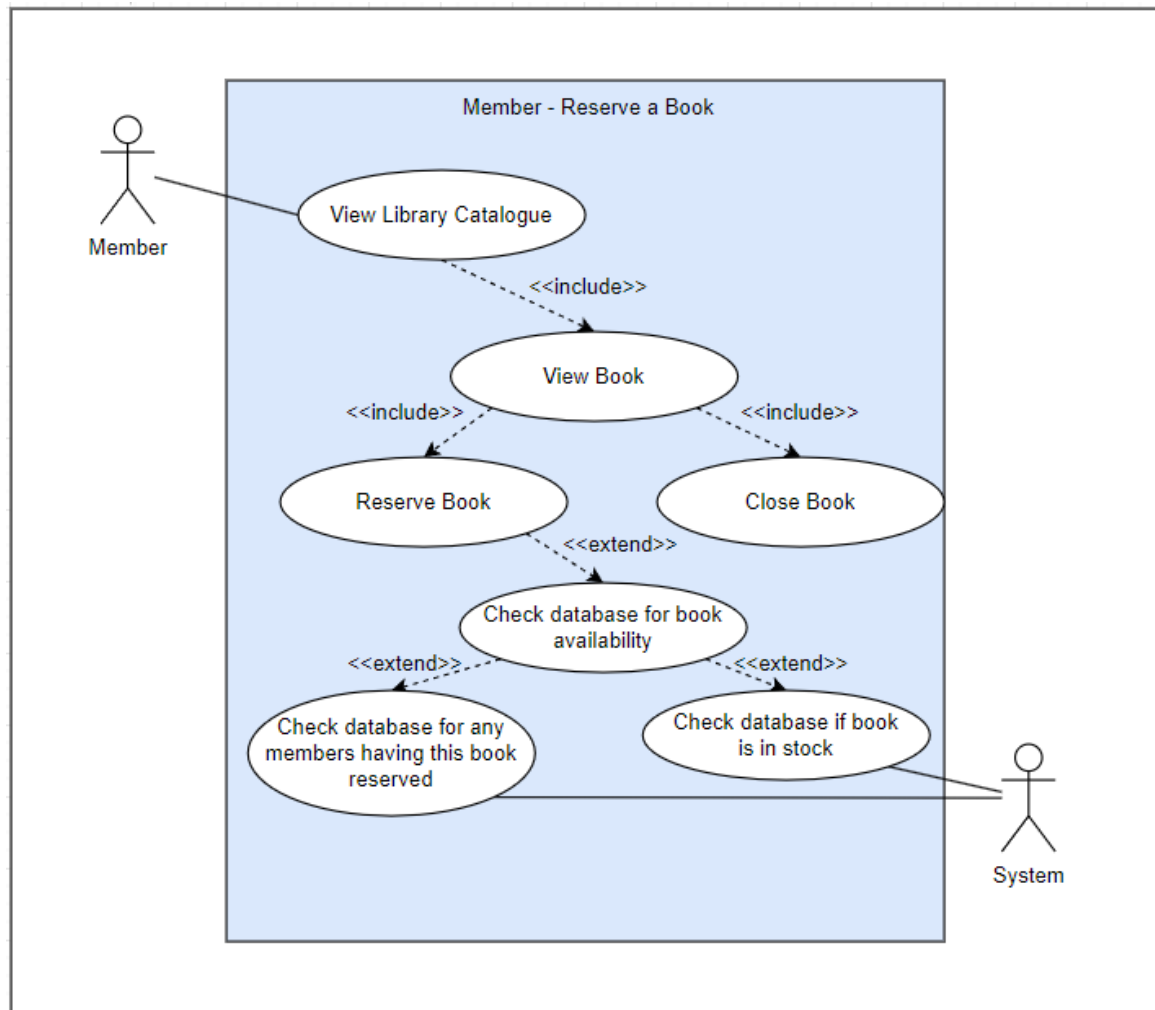
Name	Create Account Page
Actors	Administrator, Member, System
Description	This use case diagram is to demonstrate how the Create Account / Register page works
Pre-Condition	Administrator must have an existing account
Post Condition	The member will have its login information added to the database
Actions	1. Member clicks on "Register" 2. System will ask for user's username and password 3. System will check if username exists 4. If none, user is successfully created
Exceptions	Errors will be thrown if the user: a. Username exists



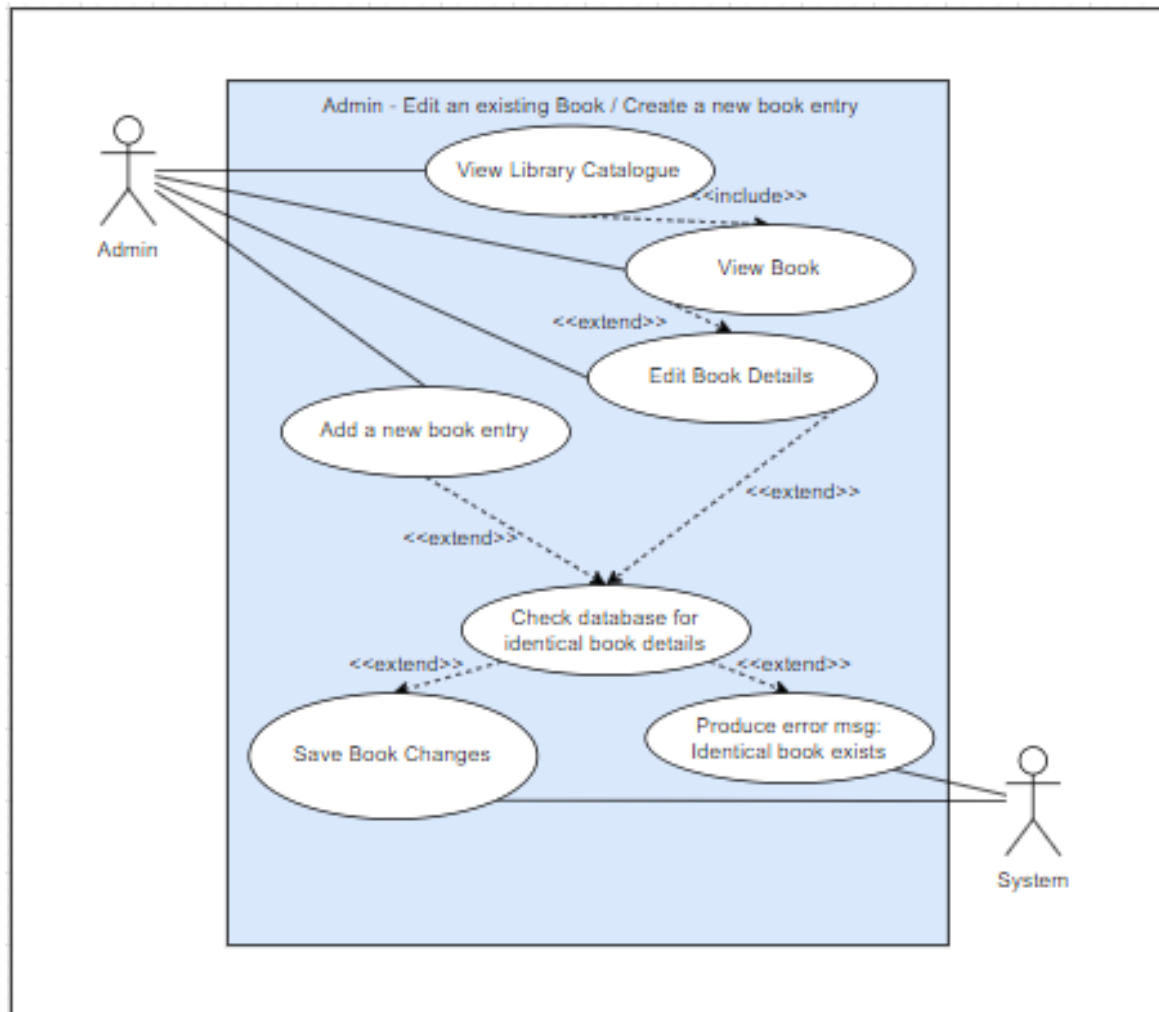
Name	Member – Profile Management
Actors	Admin, Member, System
Description	This illustration will demonstrate how the admin and the member will navigate through their profile page
Pre-Condition	Admin must have an existing account
Post Condition	Member will be able to edit their profile
Actions	1. Member views profile 2. Member clicks on “Edit Info” 3. System checks the database for existing similar data such as username, or name 4. If none, Profile info is changed successfully
Exceptions	Errors will be thrown if the user: a. Username already exists b. Name already exists in the system



Name	Admin – Member Management
Actors	Admin, System
Description	This illustration will demonstrate how the admin will navigate through their profile page
Pre-Condition	Admin must have an existing account
Post Condition	-
Actions	<ol style="list-style-type: none"> <li>1. Admin sees the lists of existing members</li> <li>2. Admin views one of the members' profile</li> <li>3. Admin clicks on "Edit Info"</li> <li>4. System checks the database for existing similar data such as username, or name</li> </ol> <p>If none, Profile info is changed successfully</p>
Exceptions	<p>Errors will be thrown if the user:</p> <ol style="list-style-type: none"> <li>a. Username already exists</li> </ol> <p>Name already exists in the system</p>

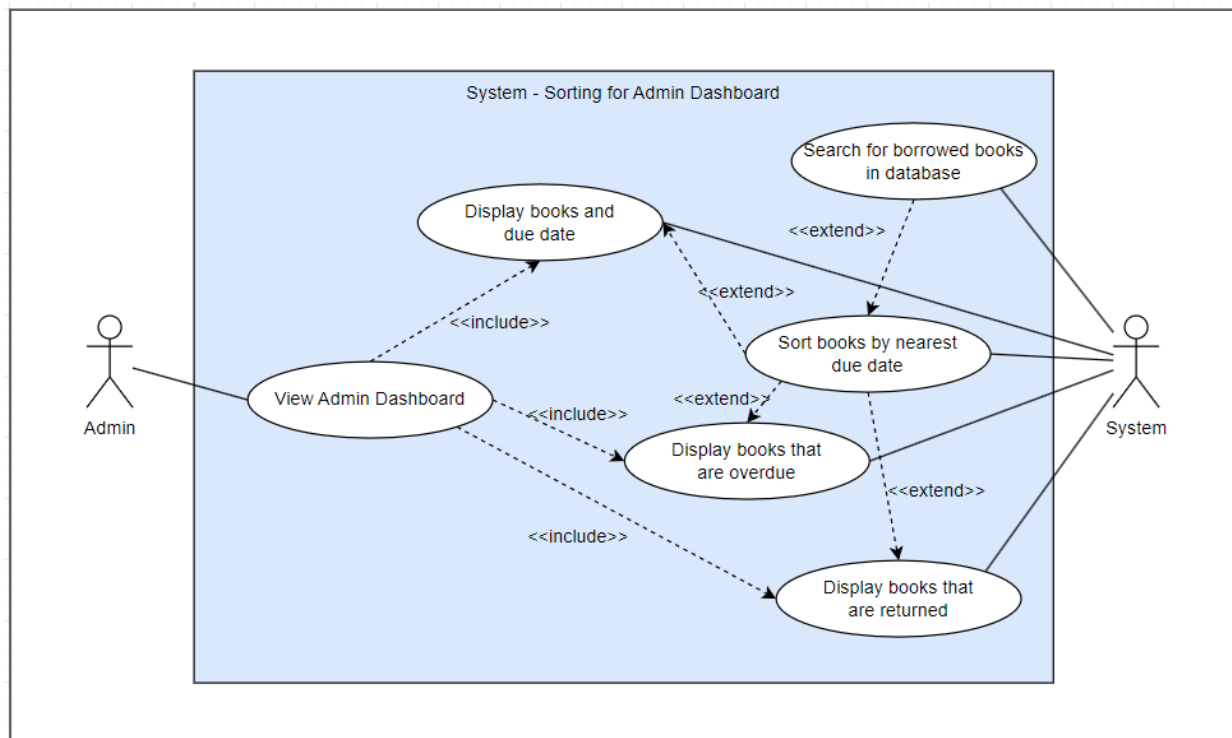


Name	Member – Reserve a Book
Actors	Member, System
Description	This diagram shows how the member can reserve a book through the library catalogue
Pre-Condition	Member must have an existing account
Post Condition	-
Actions	<ol style="list-style-type: none"> <li>1. Member looks at the catalogue</li> <li>2. Member clicks on the book to view its information</li> <li>3. Member clicks on “Reserve Book”</li> <li>4. System will check database for book availability</li> <li>5. If available, the book is reserved for the member</li> </ol>
Exceptions	<p>Errors will be thrown if the book is:</p> <ol style="list-style-type: none"> <li>a. Book is reserved under someone else’s account</li> <li>b. Book is still being borrowed, and is not in stock</li> </ol>

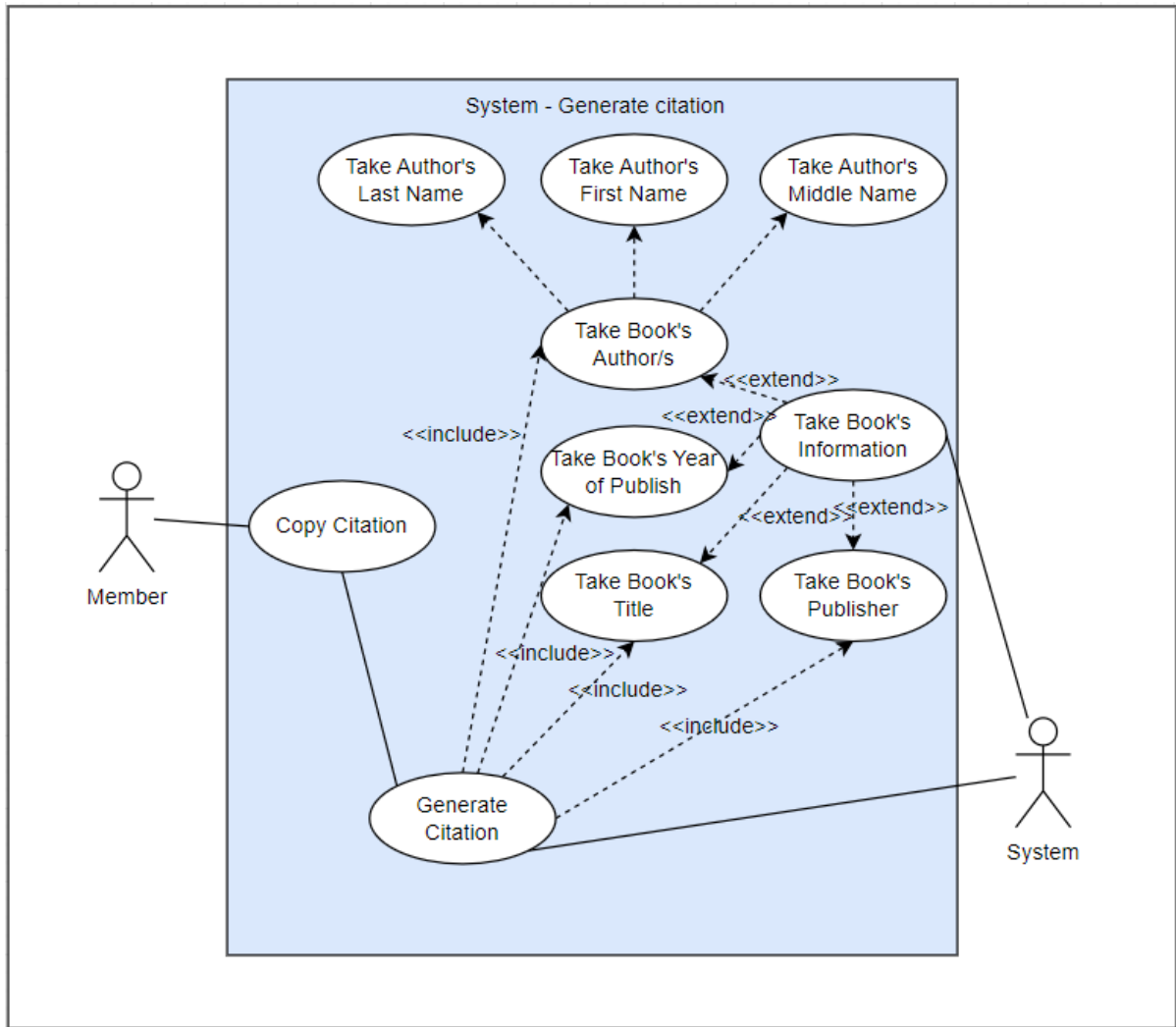


Name	Admin – Edit an existing book
Actors	Admin, System
Description	This diagram shows how the admin edits an existing book's information and also shows how to create a new book entry to the catalogue
Pre-Condition	Admin must have an existing account
Post Condition	-
Actions	<b>1. Editing an existing book</b> <ol style="list-style-type: none"> <li>Admin views the library catalogue</li> <li>Admin views the book info</li> <li>Admin clicks on "Edit details"</li> <li>System checks database for identical book information</li> </ol> <b>2. Creating a new book</b> <ol style="list-style-type: none"> <li>Admin views the library catalogue</li> <li>Admin clicks on "add new entry"</li> <li>System checks the database for existing book entry</li> </ol>
Exceptions	Errors will be thrown if the book is: <ol style="list-style-type: none"> <li>The book has an identical entry on all areas (Book name, author, year of publish etc.)</li> </ol>





Name	System Sorting for Admin Dashboard
Actors	Admin, System
Description	This will demonstrate how the system will sort out the book catalogue in search of books that are overdue or returned
Pre-Condition	Admin should have an existing account
Post Condition	-
Actions	<ol style="list-style-type: none"> <li>1. System will isolate books that are currently in the status "borrowed"</li> <li>2. System will sort the borrowed books by their due date</li> <li>3. Display the books that are overdue, returned, and are nearing their due dates and display it in the admin dashboard</li> </ol>
Exceptions	-



Name	System Generating Citation
Actors	Member, System
Description	This Diagram shows how the system takes the book's information and generates a citation (in APA format) the member can use
Pre-Condition	Member should have an existing account System should have the book in the database
Post Condition	-
Actions	<ol style="list-style-type: none"> <li>1. System takes the book's information, this being the author's name, Book's year of publish, Book's Title, and Book's Publisher</li> <li>2. System will generate citation in APA format, being: Author Last name, First initial. Middle initial. (Year Published). Title of work. Publisher.</li> <li>3. Member should be able to copy the given citation</li> </ol>
Exceptions	-

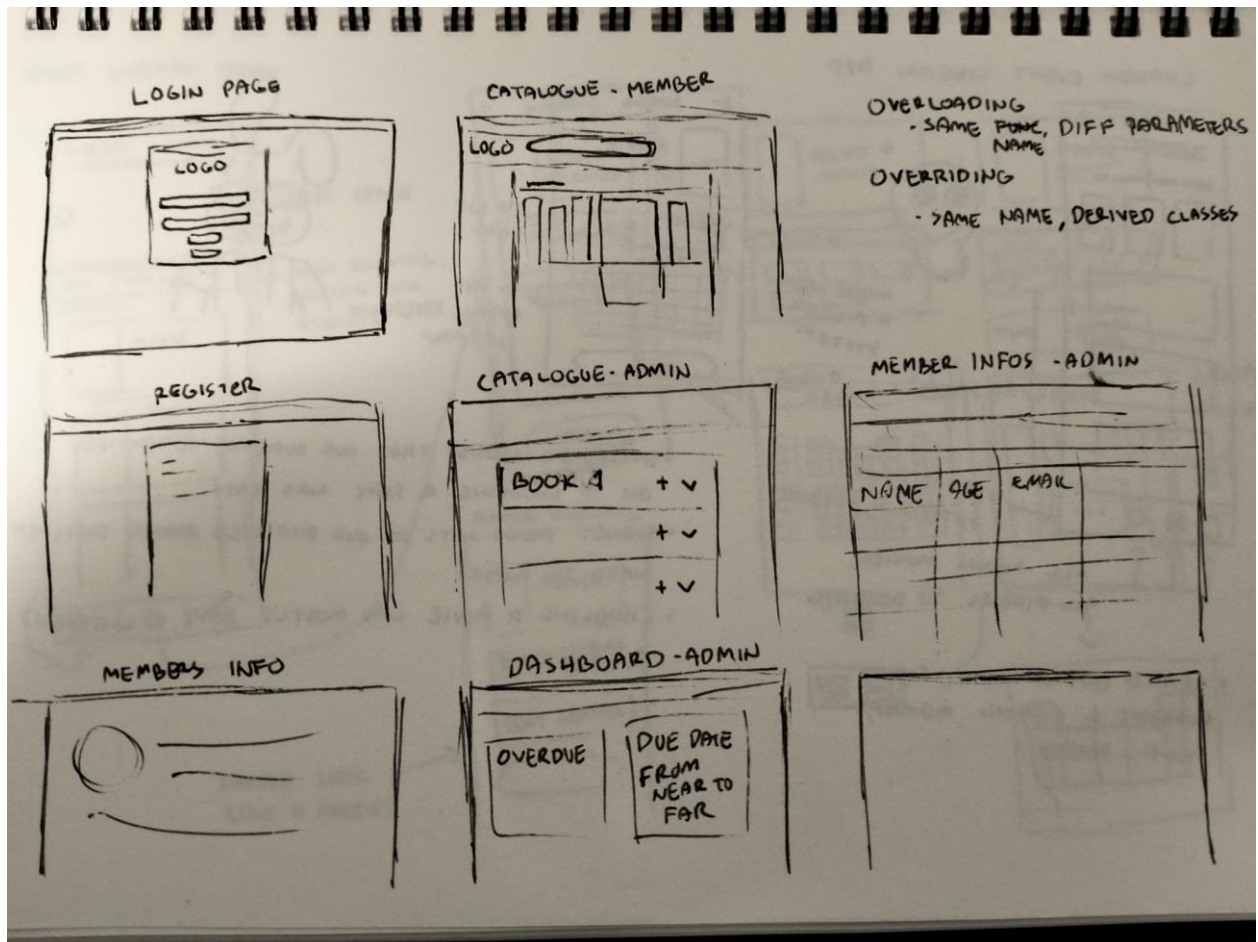
## UX Design

Since we have the requirements done, we are going to focus on our first iteration of the design. For the first design we will mainly be focusing on the position and size of everything on the screen.

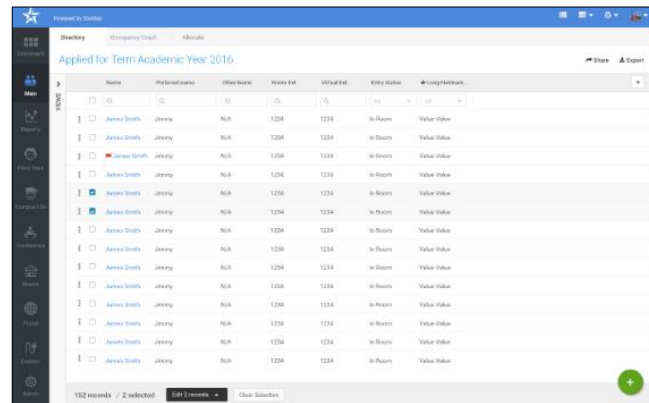
Due to the waterfall process approach we will be focusing on receiving enough feedback to ensure that when making the final product we don't have to come back to this step. The process we are taking is:

1. Create the sketch. The sketch will be a rough 20-minute sketch consisting of the necessary pages along with some-what appropriate sizing.
2. Create a Lo-fi wireframe based on the sketch, which will stay true to the sketch and only change if need be.
3. Conduct user testing. We will ask users to test each page and decide if the information is navigable and easy to locate.
4. Create the hi-fi based on the user testing and the lo-fi design.
5. Finally, test the hi-fi with the users to see if the design has been approved on.

## Sketch



The sketch is simple and consists of simple design which basically helps us understand what pages need to be developed during the lo-fi stage of the process. Inspirations for these sketches were the categorized sections on an e-commerce site such as Mighty Ape, and the admin sketches were inspired from Starrez, a system for keeping booking database that John uses from his workplace.



[Lo-fi link](#)

## Registration/login system

The image displays two wireframe screenshots of a web application interface, likely for a book store named 'BOOKHOPPER'.

**Top Wireframe (Login Page):**

- Header:** Features the 'BOOKHOPPER' logo, a search bar, and navigation links for 'Books', 'Log In / Sign Up', and 'Settings'.
- Form:** A central login form with the following elements:
  - Label: 'E-mail / Username' above a text input field.
  - Label: 'Password' above a password input field.
  - Buttons: 'Log In' and 'Admin Log In'.
  - Links: 'Not a member? Register Here'.

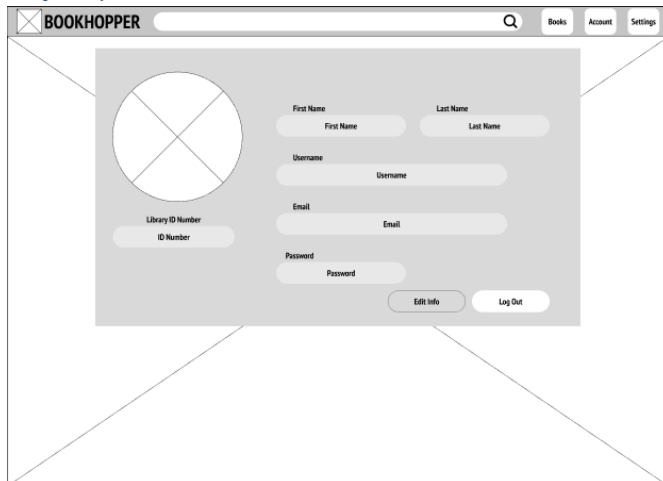
**Bottom Wireframe (Registration Confirmation Page):**

- Header:** Identical to the top wireframe, featuring the 'BOOKHOPPER' logo, search bar, and navigation links.
- Message:** A central message box stating 'Your account has been created. You can now login.'
- Button:** A 'Log In' button located below the message.

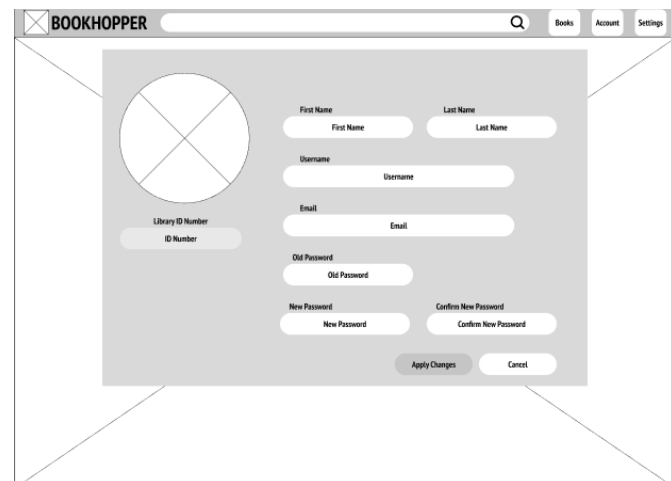
The image shows a wireframe for a registration page. At the top, there is a header bar. On the left of the header is the 'BOOKHOPPER' logo. To its right is a search bar with a magnifying glass icon. Further right are three navigation links: 'Books', 'Log In / Sign Up', and 'Settings'. The main body of the page is a light gray rectangle centered on a white background. Inside this rectangle is a registration form. The form consists of several input fields: 'First Name' and 'Last Name' (two small fields side-by-side), 'Username' (a single wide field), 'Email' (a single wide field), 'Password' and 'Confirm Password' (two fields side-by-side), and a 'Register' button at the bottom. All text and labels are in a sans-serif font.

These 3 screens are the login and registration system. Once pressed on the register button the user is prompted with a screen which gives the visual feedback that the users account has been created. The login button on the other hand once pressed take them to the catalogue page. Underneath the login button is the admin login button which when pressed takes the user to the admin login page. From user testing conducted the users found no issue with his system and found it quite easy which is a good sign. Although the users found no issues, they did suggest that **the password boxes shouldn't be side by side but rather on top of each other to allow for longer passwords.**

## Profile system



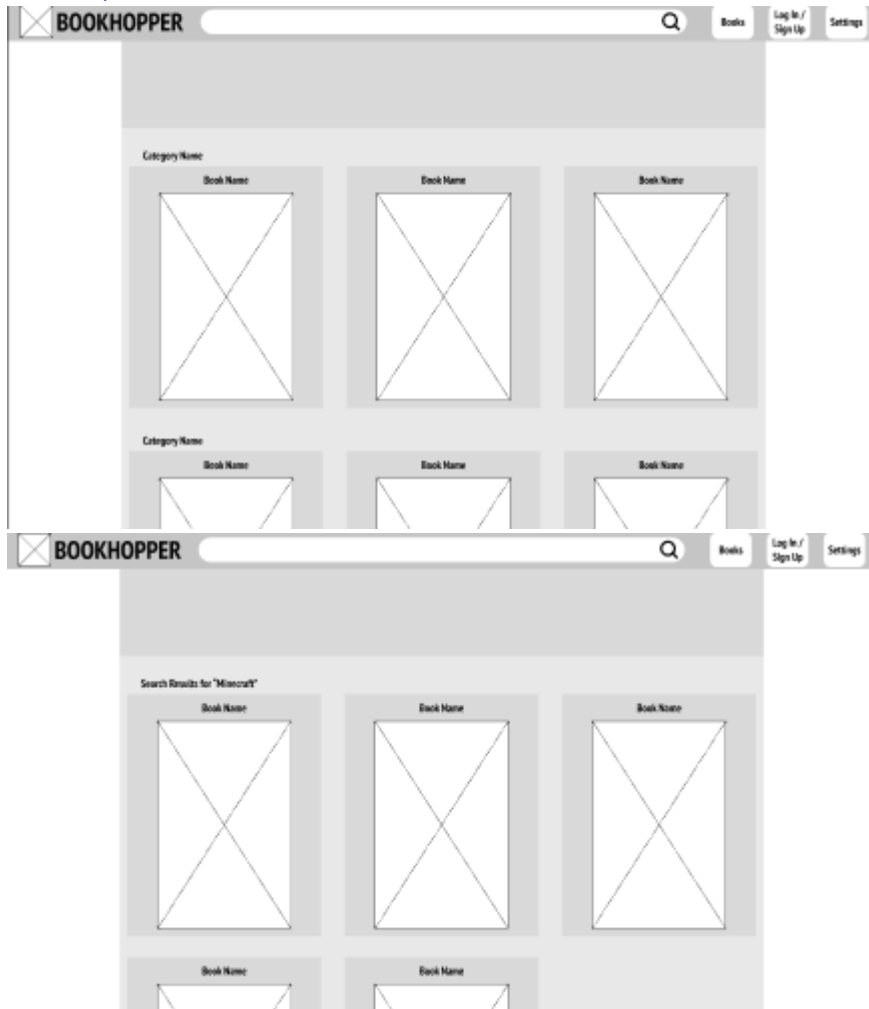
A wireframe of a user profile page for 'BOOKHOPPER'. The page has a top navigation bar with a search icon, 'Books', 'Account', and 'Settings' links. The profile section includes a circular placeholder for a profile picture, a 'Library ID Number' field, and input fields for 'First Name', 'Last Name', 'Username', 'Email', and 'Password'. At the bottom right, there are 'Edit Info' and 'Log Out' buttons.



A wireframe of an 'Edit Info' page for 'BOOKHOPPER'. It features the same top navigation bar. The form includes fields for 'First Name', 'Last Name', 'Username', 'Email', 'Old Password', 'New Password', and 'Confirm New Password'. At the bottom right, there are 'Apply Changes' and 'Cancel' buttons.

The profile pages consist of boxes containing the hypothetical users first name, last name, username, email, password, and ID Number. There are also two buttons on the screen edit info and log out. The log out button redirects the user to the login page while the edit info button takes the user to a new screen which includes the options to change any of their details along with the password which makes the user input their new password and for the user to retype it in the confirm new password box. Apply changes and cancel replace the other two buttons at the bottom. After conducting user testing most of them could agree that **on the profile page the user shouldn't have their password shown on their profile**. This can be a hazard if the user forgets to logout of their account while on a shared device. Another user then proceeds to try, and logout of their library account and they see their password. The users in the user testing suggested **making the user enter in their password again when trying to change any of their details**.

### Search system



The catalogue pages which can be accessed either after you login, by pressing or the logo located in the top left, or after you hypothetically write something in the search bar and press the magnifying glass. The first catalogue page has many results and continues to have the same header as every other page. When you scroll down on the page the items in it start to move but the header stays at the same spot. If you press on the magnifying glass it takes you to the page which has an example search entered in and the numbers of results is greatly reduced. After conducting user testing, we found that most users are fine with this system as this has become an industry standard at this point. **The users found no issues.**

### Booking page

	<input type="text"/>		Books	Account	Settings
Active Book Reservations					
Book Name	Transaction ID	Date Borrowed	Due Date	Status	
Book Name	Transaction ID	Date Borrowed	Due Date	Status	
Book Name	Transaction ID	Date Borrowed	Due Date	Status	
Book Reservation History					
Book Name	Transaction ID	Date Borrowed	Due Date	Status	
Book Name	Transaction ID	Date Borrowed	Due Date	Status	
Book Name	Transaction ID	Date Borrowed	Due Date	Status	

This booking can only be accessed once logged in and showcases all the books the user has reserved at the current time, and which books the user has previously reserved. Once pressed on one of the books a submenu is bought up in the middle of the screen which showcases more information about the book and gives the book an image. On this page **the users found nothing wrong with the layout and thought the page worked fine.**

### User feedback in general from the member part

The users wondered if the settings button, located on the header, was necessary and suggested removing it to declutter the header. The users also suggested that most of the information located within the settings menu could be found elsewhere e.g., account menu.

### Admin Dashboard

	<input type="text"/>	Settings																														
Home	<table><tr><td colspan="3">Books Overdue</td></tr><tr><td>Book Name</td><td>Transaction ID</td><td>Due Date</td></tr><tr><td>Book Name</td><td>Transaction ID</td><td>Due Date</td></tr><tr><td>Book Name</td><td>Transaction ID</td><td>Due Date</td></tr><tr><td>Book Name</td><td>Transaction ID</td><td>Due Date</td></tr></table>	Books Overdue			Book Name	Transaction ID	Due Date	Book Name	Transaction ID	Due Date	Book Name	Transaction ID	Due Date	Book Name	Transaction ID	Due Date	<table><tr><td colspan="3">Books Due within the next 7 Days</td></tr><tr><td>Book Name</td><td>Transaction ID</td><td>Due Date</td></tr><tr><td>Book Name</td><td>Transaction ID</td><td>Due Date</td></tr><tr><td>Book Name</td><td>Transaction ID</td><td>Due Date</td></tr><tr><td>Book Name</td><td>Transaction ID</td><td>Due Date</td></tr></table>	Books Due within the next 7 Days			Book Name	Transaction ID	Due Date	Book Name	Transaction ID	Due Date	Book Name	Transaction ID	Due Date	Book Name	Transaction ID	Due Date
Books Overdue																																
Book Name	Transaction ID	Due Date																														
Book Name	Transaction ID	Due Date																														
Book Name	Transaction ID	Due Date																														
Book Name	Transaction ID	Due Date																														
Books Due within the next 7 Days																																
Book Name	Transaction ID	Due Date																														
Book Name	Transaction ID	Due Date																														
Book Name	Transaction ID	Due Date																														
Book Name	Transaction ID	Due Date																														
Books																																
Members	<table><tr><td colspan="3">Returned Books within the 7 Days</td></tr><tr><td>Book Name</td><td>Transaction ID</td><td>Due Date</td></tr><tr><td>Book Name</td><td>Transaction ID</td><td>Due Date</td></tr><tr><td>Book Name</td><td>Transaction ID</td><td>Due Date</td></tr><tr><td>Book Name</td><td>Transaction ID</td><td>Due Date</td></tr><tr><td>Book Name</td><td>Transaction ID</td><td>Due Date</td></tr></table>	Returned Books within the 7 Days			Book Name	Transaction ID	Due Date	Book Name	Transaction ID	Due Date	Book Name	Transaction ID	Due Date	Book Name	Transaction ID	Due Date	Book Name	Transaction ID	Due Date													
Returned Books within the 7 Days																																
Book Name	Transaction ID	Due Date																														
Book Name	Transaction ID	Due Date																														
Book Name	Transaction ID	Due Date																														
Book Name	Transaction ID	Due Date																														
Book Name	Transaction ID	Due Date																														
Log Out																																

This admin dashboard contains 3 menus within the main screen consisting of books overdue, books about to be due, and books returned recently. This screen along with all the other admin screens contains a side bar which allows to access the books admin menu and the people admin menu along

with a logout button which when pressed will log the admin out. The users that tested the page had no issues with the layout of the information and found the page to work fine.

#### *Admin book dashboard*

	Book ID	Book Name	Author	Genre	Status	
	Book ID	Book Name	Author		Status	
	Book ID	Book Name	Author		Status	
	Book ID	Book Name	Author		Status	
	Book ID	Book Name	Author		Status	
	Book ID	Book Name	Author		Status	
	Book ID	Book Name	Author		Status	
	Book ID	Book Name	Author		Status	
	Book ID	Book Name	Author		Status	
	Book ID	Book Name	Author		Status	
	Book ID	Book Name	Author		Status	
	Book ID	Book Name	Author		Status	
	Book ID	Book Name	Author		Status	
	Book ID	Book Name	Author		Status	
	Book ID	Book Name	Author		Status	
	Book ID	Book Name	Author		Status	

	Book ID	Book Name	Author	Genre	Status	
	Book ID	Book Name	Author		Status	
	Book ID	Book Name	Author		Status	
	Book ID	Book Name	Author		Status	
	Book ID	Book Name	Author		Status	
	Book ID	Book Name	Author		Status	

This book dashboard is pretty much the same as the previous admin dashboard with the side bar and header being the exact same. The main difference is the content on the page, where in this case the centre has a single database box rather than three different boxes. The database box contains everything within the chosen database along with features to order the database in different ways. **Users who tested this page decided that they would like there to be a title above the database which gives indication to the user on which database page they are on.**



## Admin people dashboard

The screenshot shows the 'Admin people dashboard' for 'BOOKHOPPER'. The header includes the 'BOOKHOPPER' logo and a 'Settings' button. The sidebar on the left contains buttons for 'Home', 'Books', 'Members', and 'Log Out'. The main content area displays a table of members. The table has columns for 'User ID', 'First Name', 'Last Name', 'Email', and 'Role'. The 'Role' column has a dropdown arrow. The table contains 10 rows of member data.

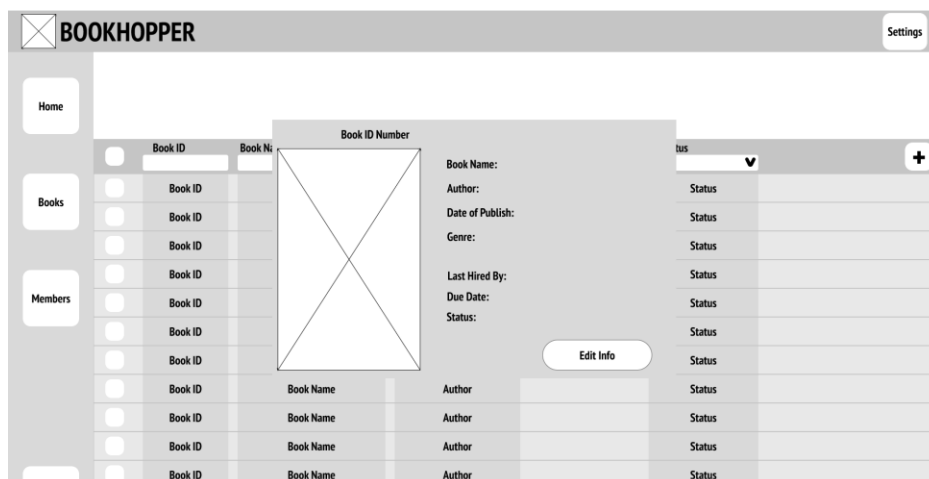
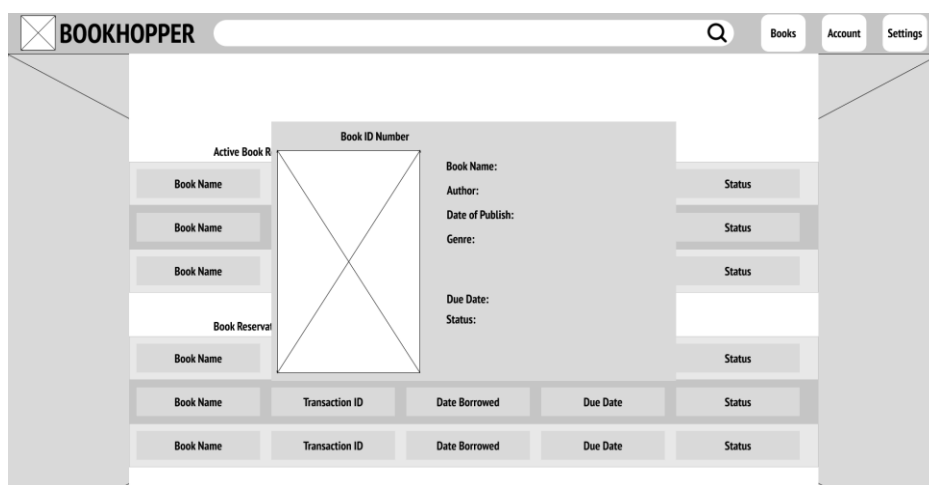
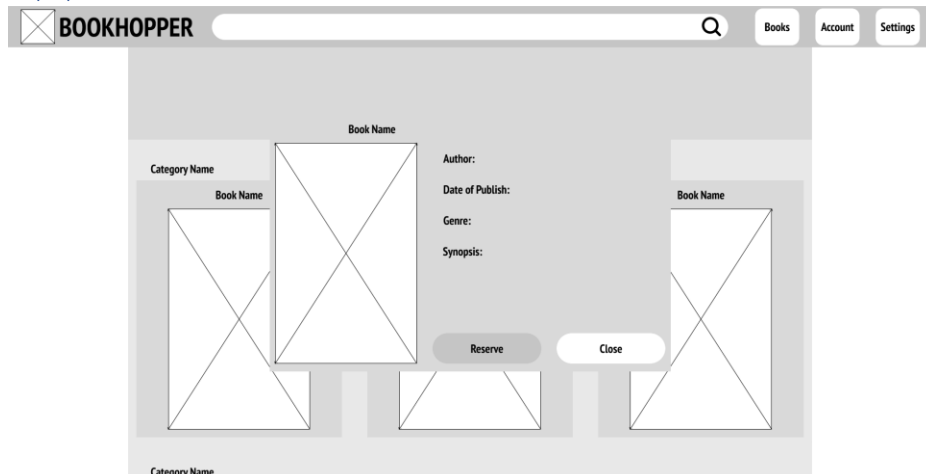
User ID	First Name	Last Name	Email	Role
Member ID	Member First Name	Member Last Name	Member Email	Role
Member ID	Member First Name	Member Last Name	Member Email	Role
Member ID	Member First Name	Member Last Name	Member Email	Role
Member ID	Member First Name	Member Last Name	Member Email	Role
Member ID	Member First Name	Member Last Name	Member Email	Role
Member ID	Member First Name	Member Last Name	Member Email	Role
Member ID	Member First Name	Member Last Name	Member Email	Role
Member ID	Member First Name	Member Last Name	Member Email	Role
Member ID	Member First Name	Member Last Name	Member Email	Role
Member ID	Member First Name	Member Last Name	Member Email	Role

The screenshot shows the 'Admin people dashboard' for 'BOOKHOPPER' with search results. The header and sidebar are the same as the previous screenshot. The main content area displays 'Search Results for: "Search"'. Below this, there is a table with columns for 'User ID', 'First Name', 'Last Name', 'Email', and 'Role'. The table contains 4 rows of member data.

User ID	First Name	Last Name	Email	Role
Member ID	Member First Name	Member Last Name	Member Email	Role
Member ID	Member First Name	Member Last Name	Member Email	Role
Member ID	Member First Name	Member Last Name	Member Email	Role
Member ID	Member First Name	Member Last Name	Member Email	Role

This people database dashboard closely resembles the earlier admin dashboard, featuring the same sidebar and header. The primary distinction lies in the page content, where the central area now hosts a single database box instead of three distinct boxes. The database box encompasses all the elements within the selected database, offering features to organize the database in various ways. Feedback from users who evaluated this page indicated a preference for having a title above the database, providing users with a clear indication of the specific database page they are currently viewing.

## Popups



On the lo-fi wireframes there are a couple of buttons that when pressed, make a pop-up appear. These pop-ups only appear if a button is pressed and only appear in the centre of the screen. During user testing, users found that there is no distinction from the background and the pop-up. This can cause the user to not know where the pop-up end and begins. A fix one user suggested was to add a drop shadow to the pop-ups to help users identify them.

*List of all the potential changes found through user testing.*

1. Password Box Layout: Users recommended placing password boxes on top of each other instead of side by side to accommodate longer passwords.
2. Password Visibility: Users suggested not displaying the password on the profile page to enhance security.
3. Password Confirmation: Users proposed requiring the entry of the password again when changing any details on the profile.
4. Settings Button Removal: Users suggested considering the removal of the settings button in the header to declutter the interface.
5. Information Placement: Users recommended relocating information found in the settings menu to other accessible areas, such as the account menu.
6. Database Title (Admin Book Dashboard): Users suggested adding a title above the database on the book dashboard for clear indication of the database page.
7. Database Title (Admin People Dashboard): Like the book dashboard, users suggested adding a title above the database on the people dashboard for clarity.
8. No distinction of pop-ups from foreground: When pop-ups appear, the user had no indication where the pop-up ended making it jarring for some users.

Hi-fi prototype with user testing

*Log-in and registration pages*

BOOKHOPPER

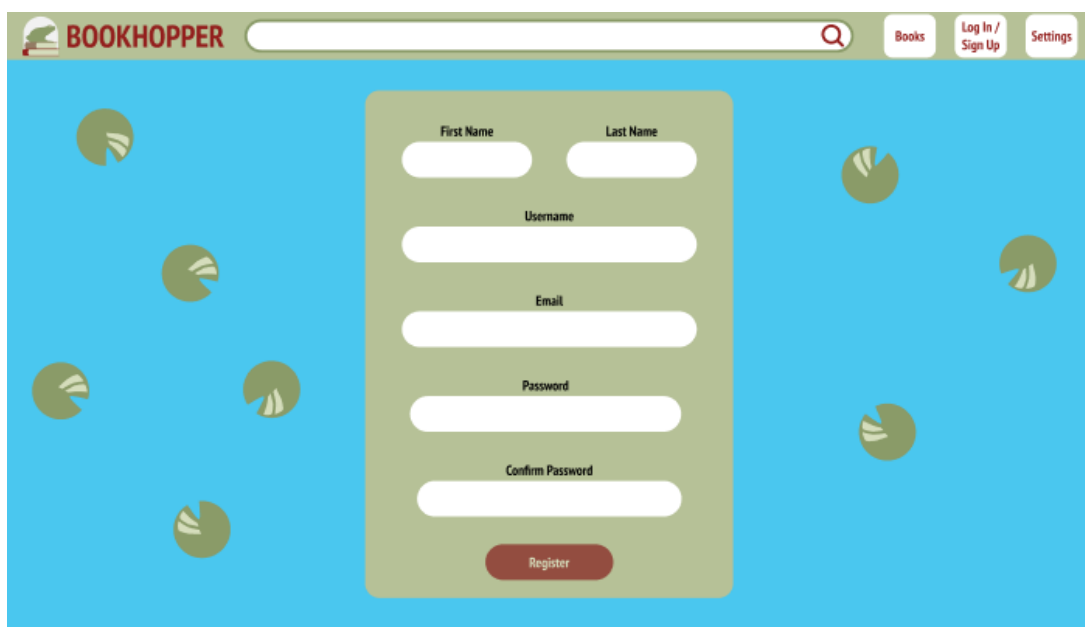
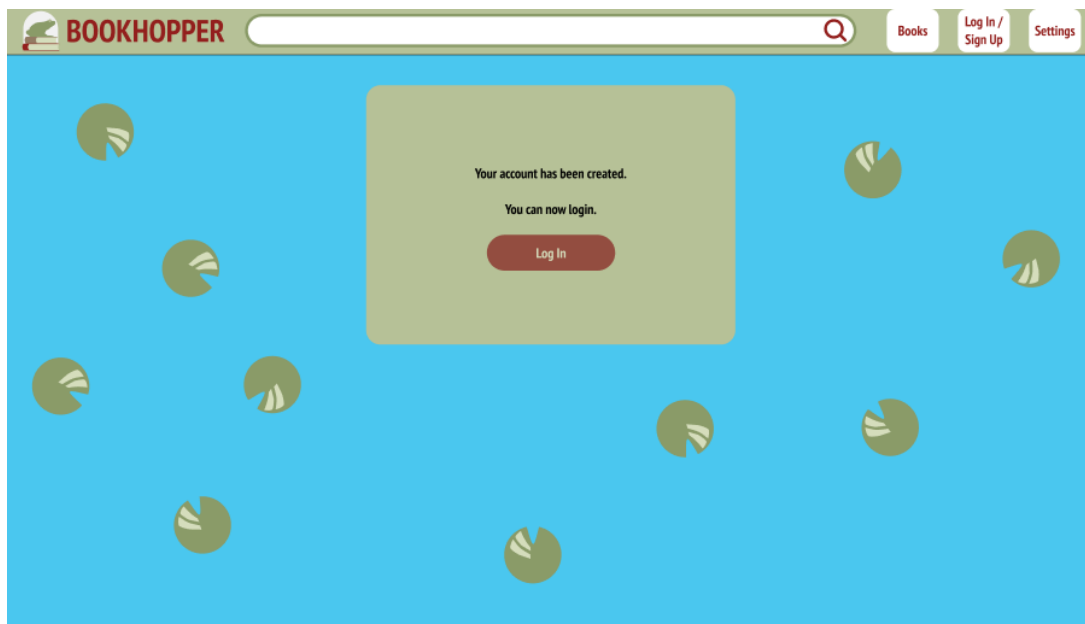
E-mail / Username

Password

Log In

Admin Log In

Not a member yet?  
Register Here



These pages have not changed that much but the background has been given a lot of colour and lily pads to make the screen look livelier. Another important change which was recommended from a user in user testing was that the confirm password and password input box on the register screen were too small. This has been updated by making the boxes one under the other and making them longer. After conducting user testing on the hi-fi design, we have found that there are no issues with it, and it is working fine.

## Profile system

The image displays two screenshots of a web application's profile system for 'BOOKHOPPER'. The top screenshot shows the initial profile page with a search bar, navigation links for 'Books', 'Account', and 'Settings', and a central profile area. The profile area includes a circular profile picture of a frog in a suit, a 'Library ID Number' field, and input fields for 'First Name', 'Last Name', 'Username', 'Email', and 'Password'. 'Edit Info' and 'Log Out' buttons are at the bottom. The bottom screenshot shows the same profile page after editing, with additional fields for 'Old Password', 'New Password', and 'Confirm New Password' added below the email field. The 'Apply Changes' and 'Cancel' buttons are at the bottom of the form.

BOOKHOPPER

First Name Last Name

Username

Email

Password

Edit Info Log Out

Library ID Number

ID Number

BOOKHOPPER

First Name Last Name

Username

Email

Old Password

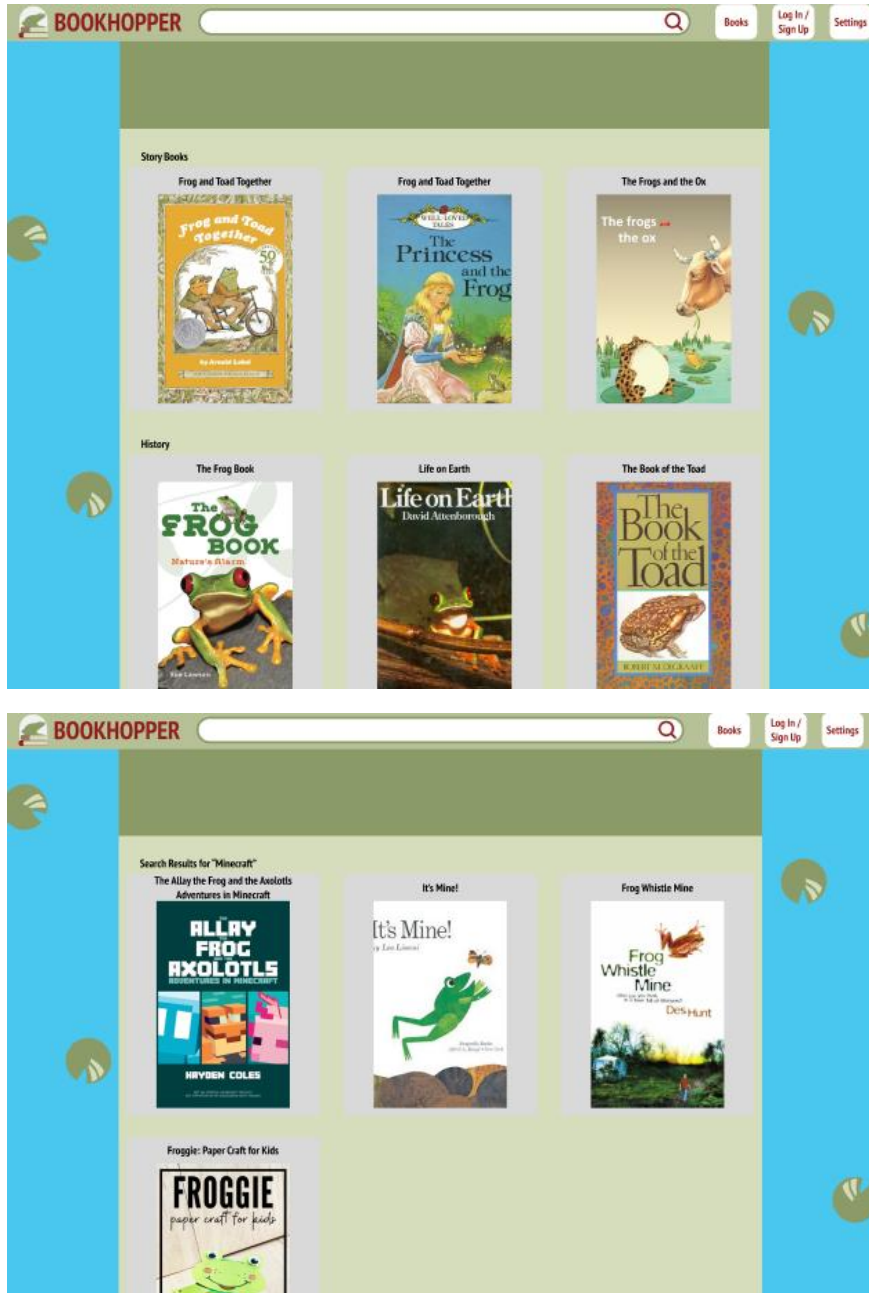
New Password

Confirm New Password

Apply Changes Cancel

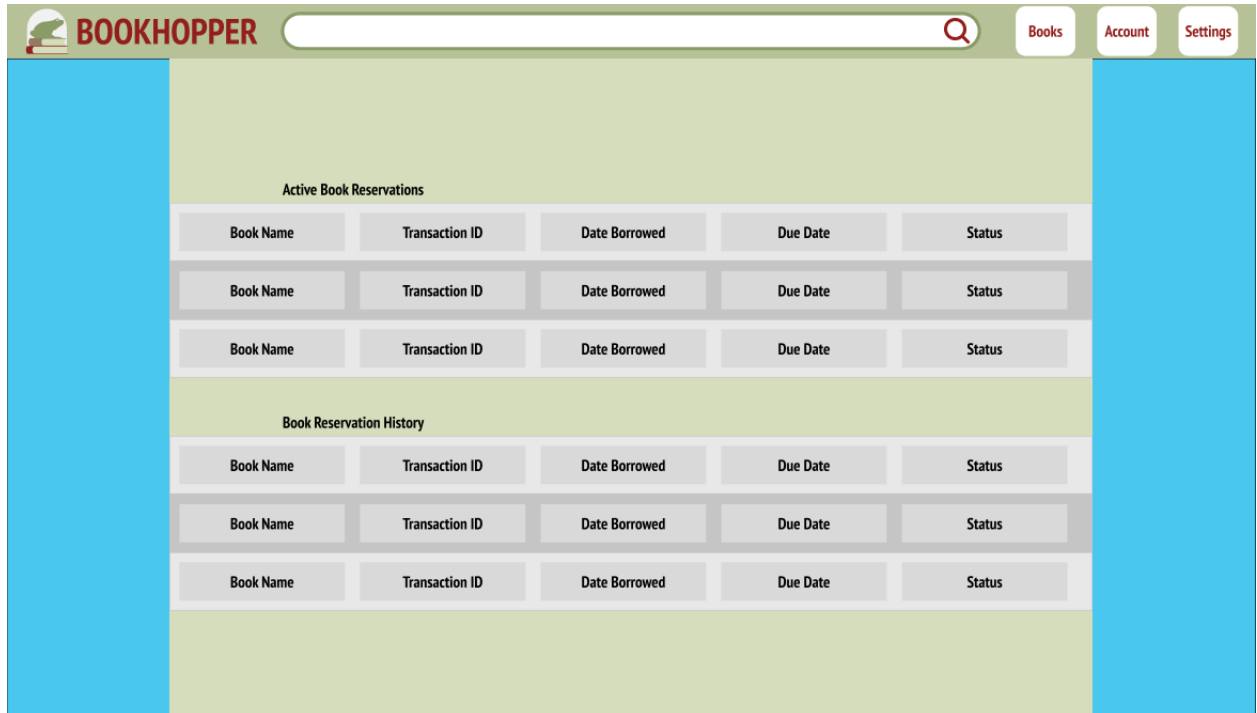
After conducting user testing on the first profile system, users found that there wasn't enough room to enter in a password and its confirmation. In the hi-fi the new password and confirm new boxes have been moved down and widened making them a lot bigger. Other than that there was no extra change. Conducting further user testing on the hi-fi suggests that the hi-fi is fine and doesn't need extra changes

## Search system



The search system hasn't changed much from the lo-fi to the hi-fi as there weren't any issues found through user testing. From user testing on the hi-fi, we have found that most of the users enjoy the style of the page and find nothing wrong with these pages.

### Booking page



The Booking page mockup features a green header bar with the 'BOOKHOPPER' logo, a search bar, and navigation links for 'Books', 'Account', and 'Settings'. The main content area is flanked by blue vertical bars. It contains two sections: 'Active Book Reservations' and 'Book Reservation History'. Each section has a table with five columns: 'Book Name', 'Transaction ID', 'Date Borrowed', 'Due Date', and 'Status'. Each table currently displays three placeholder rows.

Active Book Reservations				
Book Name	Transaction ID	Date Borrowed	Due Date	Status
Book Name	Transaction ID	Date Borrowed	Due Date	Status
Book Name	Transaction ID	Date Borrowed	Due Date	Status
Book Name	Transaction ID	Date Borrowed	Due Date	Status

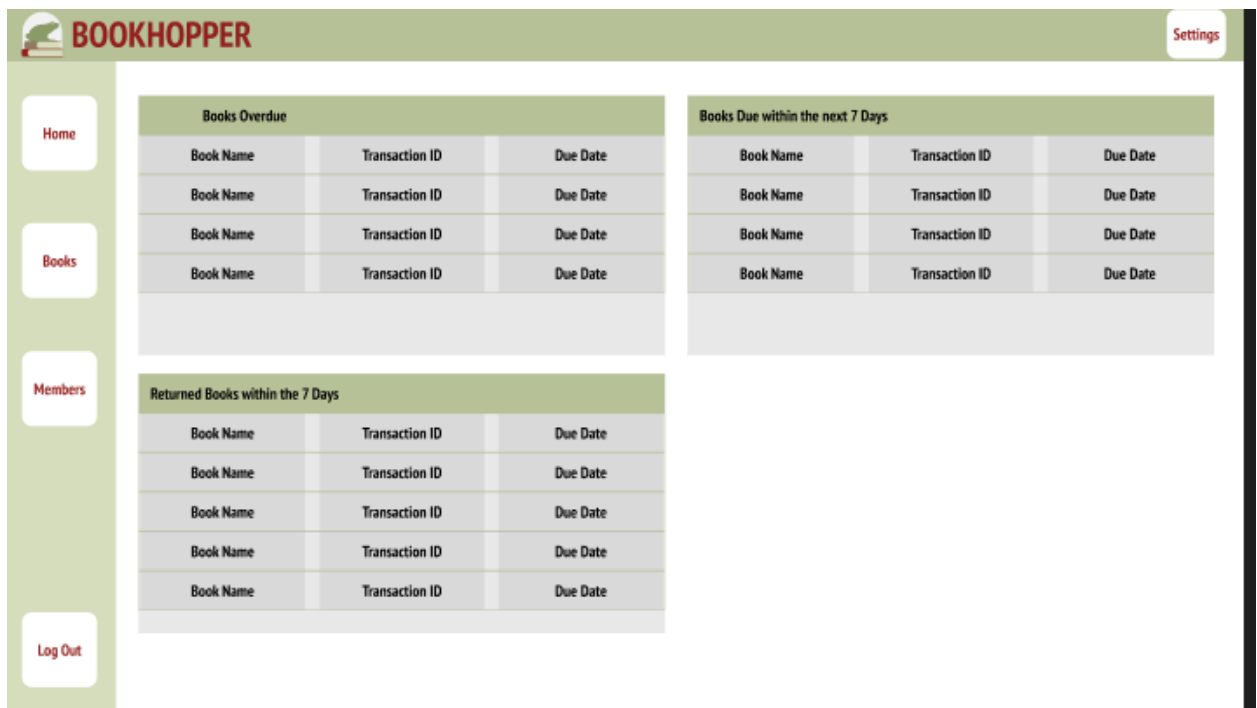
Book Reservation History				
Book Name	Transaction ID	Date Borrowed	Due Date	Status
Book Name	Transaction ID	Date Borrowed	Due Date	Status
Book Name	Transaction ID	Date Borrowed	Due Date	Status
Book Name	Transaction ID	Date Borrowed	Due Date	Status

This page hasn't changed at all from the lo-fi to the hi-fi and only colour has been added. This page doesn't need much changing and after conducting some user testing this hypothesis was confirmed to be true. The users do however like the look of the page and are fine with it.

### User feedback in general from the members pages

During user testing, most users found no problems with the newly fleshed out pages and they each seemed to like the pages which were shown to them, however they had some feedback for the admin pages.

### Admin Dashboard



The Admin Dashboard mockup has a green header with the 'BOOKHOPPER' logo and a 'Settings' link. A left sidebar contains navigation buttons for 'Home', 'Books', 'Members', and 'Log Out'. The main area is divided into three sections: 'Books Overdue', 'Books Due within the next 7 Days', and 'Returned Books within the 7 Days'. Each section contains a table with three columns: 'Book Name', 'Transaction ID', and 'Due Date'. The 'Books Overdue' and 'Returned Books' sections each show five placeholder rows, while the 'Books Due within the next 7 Days' section shows five placeholder rows.

Books Overdue		
Book Name	Transaction ID	Due Date
Book Name	Transaction ID	Due Date
Book Name	Transaction ID	Due Date
Book Name	Transaction ID	Due Date
Book Name	Transaction ID	Due Date
Book Name	Transaction ID	Due Date

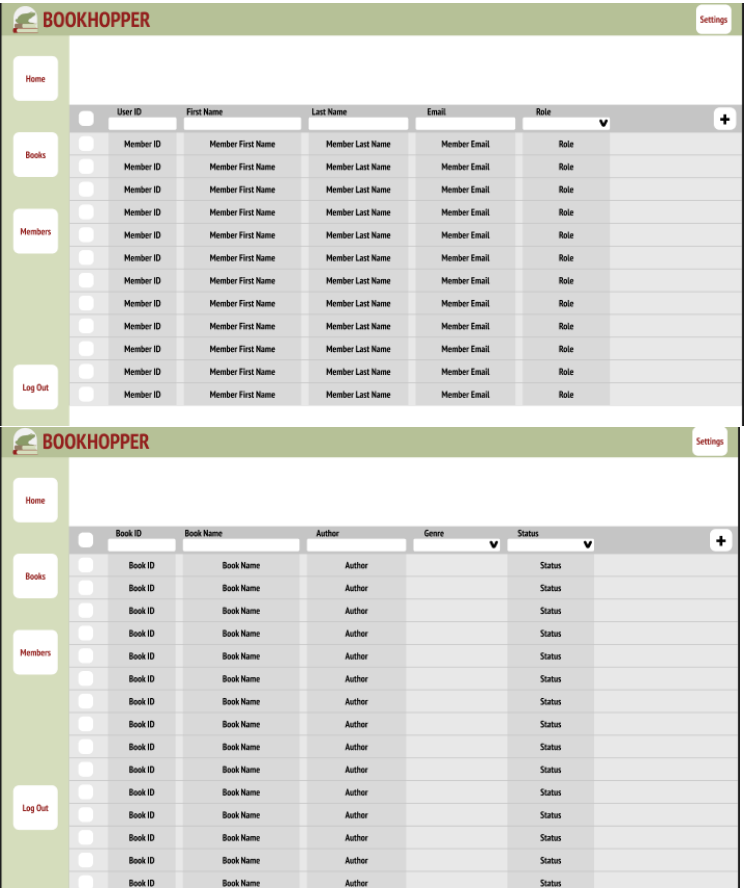
Books Due within the next 7 Days		
Book Name	Transaction ID	Due Date
Book Name	Transaction ID	Due Date
Book Name	Transaction ID	Due Date
Book Name	Transaction ID	Due Date
Book Name	Transaction ID	Due Date
Book Name	Transaction ID	Due Date

Returned Books within the 7 Days		
Book Name	Transaction ID	Due Date
Book Name	Transaction ID	Due Date
Book Name	Transaction ID	Due Date
Book Name	Transaction ID	Due Date
Book Name	Transaction ID	Due Date
Book Name	Transaction ID	Due Date

This page has not changed that much. After conducting user testing the users would have liked for more indication as to which page, they are on but did not find it too much of a necessity. Other than that small issue the users found this page fine and thought that it looked interesting.

Admin book and people dashboard



The admin book and people dashboard haven't changed that much. The users who tested these pages gave the feedback that there is a lack of indication within these pages which made it hard to locate exactly which page the user is on. The user gave the feedback of making either the buttons on the left have colours on them to indicate that they are on that page, or they would like a title.

Popups





The popups have changed a little with a drop shadow being present. This helps the user to identify which is the popup and which is the background. This change was met with great reception during user testing as they enjoyed being able to finally tell the difference of the background and the popup.

*List of all the potential changes found from user testing on the hi-fi prototype.*

1. On the admin pages there is no indication on which dashboard the user is on. Adding a title on the top of data entries would possibly fix this issue, certainty would need to be confirmed through user testing.
2. One of the users pointed out that for the admin pages, he wishes the pop-ups would have a close button in its top right, clicking away is effective but a responsive button to close the window would help better.
3. The same user also suggested to have the three sections in the admin homepage to be in the same row to not draw the eye less to the chart at the bottom of the page.