Software Requirements Specifications

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Library Information System

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Software Engineering

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1.0 Introduction

1.1 Purpose

This document will present a detailed description of our library information system. This will include its overall purpose, use-case diagrams for different types of users, functional requirements, non-functional requirements, a description of the minimum viable product (MVP) and additional features that could be negotiated.

1.2 Scope of the Project

The library information system will enable members to log in, search, view, borrow and return books to and from the library. It will also enable administrator's to modify the book catalogue, add members and modify member information.

The system will be designed with a login screen for users. Correctly entered admin details will provide access to the administrative interface. Correctly entered user-details will provide access to the user interface.

1.3 Prioritisation (MVP)

Our initial focus will be to develop the minimum viable product, which has been outlined in the project scope. Each use-case is explained in detail later in this document. To summarise, administrators will need to log-in, view members, add members, edit member details, view book catalogue, add books and remove books. Members will need to log in, view the book catalogue, borrow books and view books on loan. Each of these functions will take priority upon commencing development.

1.4 Optionalities

Once the MVP has been developed, there will be a list of further features we can add. It has been divided into 2 sections. The first, will be features we hope to include in the initial product but are not essential. The second will be features we can add after the release, depending on time and resource negotiation.

1. **Features we'd like to include with initial development.**

    a. Search functionality that assists with all catalogue searching using keywords.

    b. Advanced search features enabling members to filter search with genre, author and title.

    c. Display/upload book covers in the book catalogue.

    d. Multiple copy tracking, enabling administrators to include such information in the tracking system when accessing the book catalogue.

    e. Implement a reservation system, enabling members to reserve books currently on loan.

2. **Features that could be developed with further negotiation with the client. These could be developed with the condition of more allocated hours.**

    a. Enable users to provide reviews and ratings for books they've read.

    b. Provide recommended and personalised suggestions for members based on their history and the book's rating.

    c. Due date management functionality with fines and notifications when books are almost or overdue.

2.0 Overall Description

2.1 System Environment

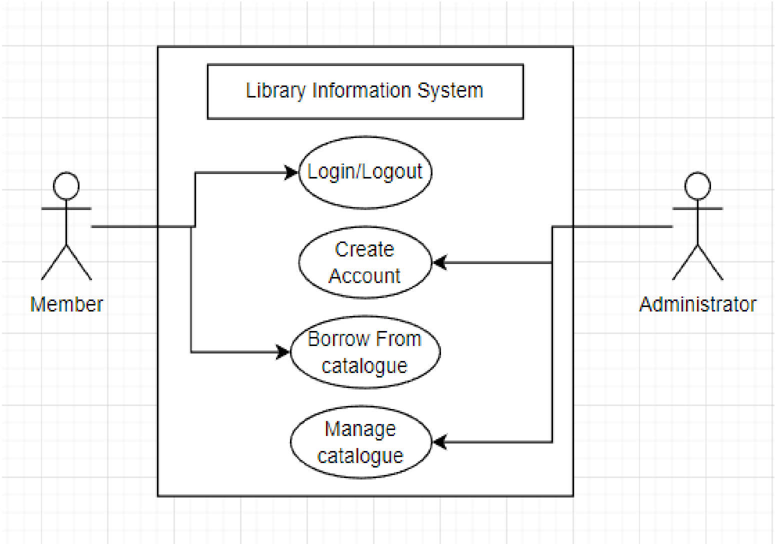


Figure 1 - Brief overview

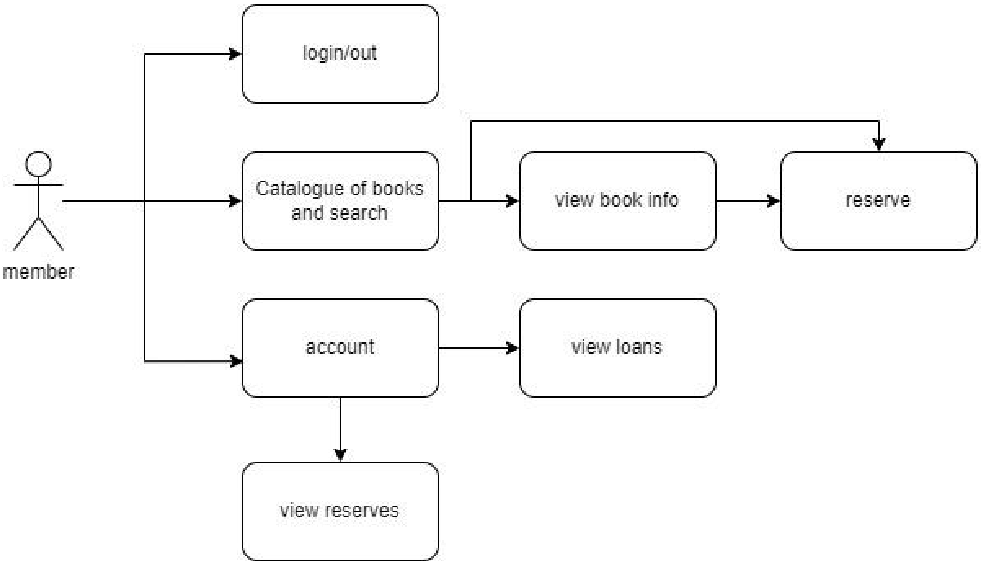


Figure 2 - Member use case overview

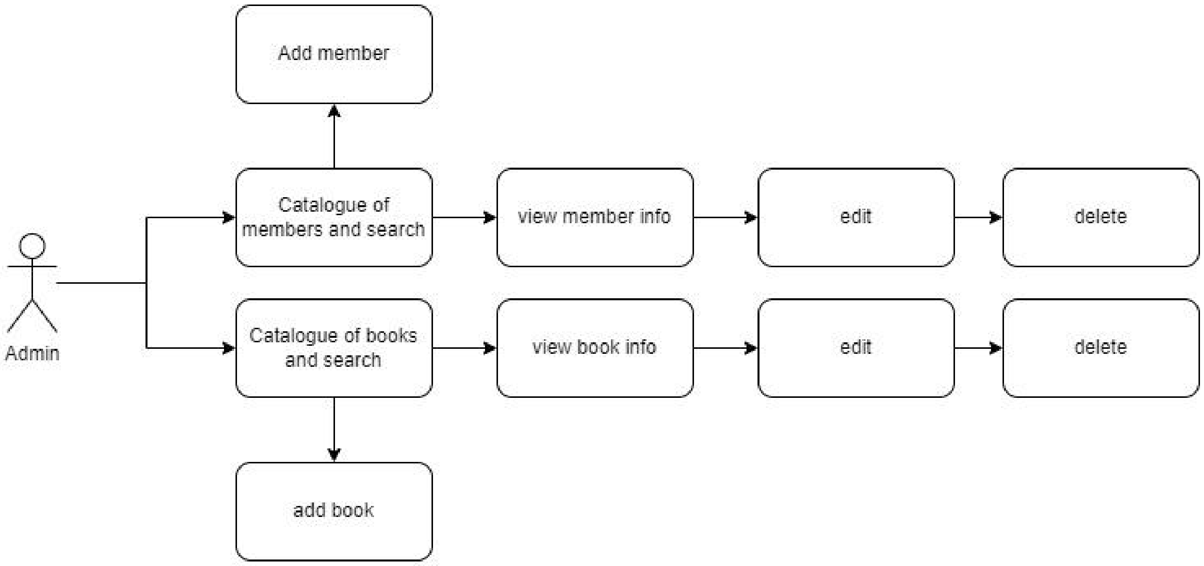
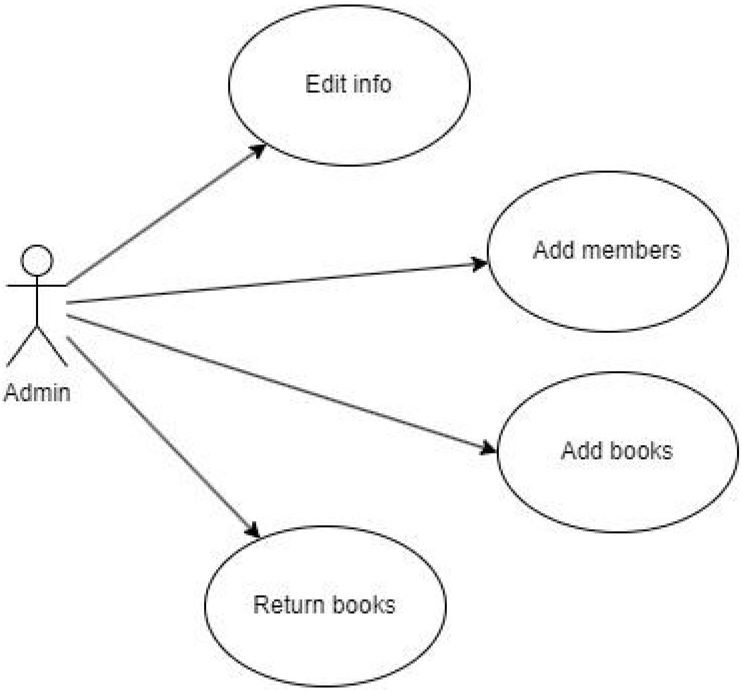


Figure 3 - Admin use case overview

Figure 2 and 3 illustrates the general use-case overview for members and admins. Each user has a unique interface. Admins can add, edit and update member accounts, enabling members to login. Admins can also add, edit or remove available books in the catalogue which members have access to view and borrow from.

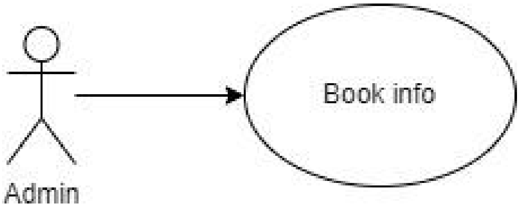
2.2 Functional Requirements Specification

2.2.1 Admin use cases



Use case: **View book info**

Diagram:



Brief Description

The admin has access to all the books in the system, they find a book and select it to see all its information

Initial Step-By-Step Description

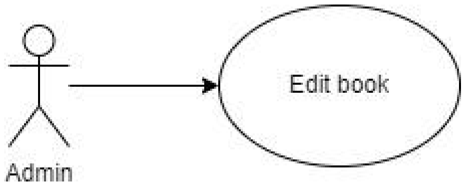
Before this use case can be initiated, the admin has already accessed the library system interface.

1. The admin can search through the catalogue using keywords from the book.
2. The system displays the options that match the keywords to the Admin
3. The Admin selected a book
4. The system presents the information to the admin

Xref: Section 3.2.1, View book info

Use case: **Edit book info**

Diagram:



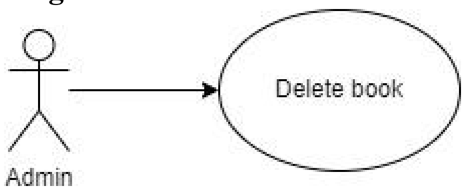
Brief Description
The admin has access to all the books in the system, they find a book and select it to see all its information and can also edit that information.

Initial Step-By-Step Description
Before this use case can be initiated, the admin has already accessed the info page of the book they want to edit.

1. The admin clicks on a button to edit the books information
2. The system switches to “edit mode”, and now all information fields are editable
3. After editing the admin clicks on a button to save the changes
4. The system saves the new changes and switched back to “view mode”

Xref: Section 3.2.2, Edit book info

Use case: **Delete book**
Diagram:



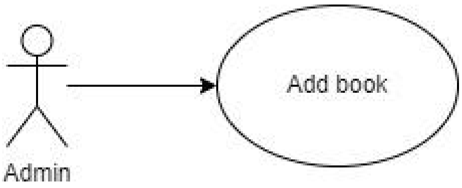
Brief Description
The admin has access to all the books in the system, they find a book and select it to see all its information and also have the option to delete it from the system.

Initial Step-By-Step Description
Before this use case can be initiated, the admin has already accessed the info page of the book they want to delete.

1. The admin clicks on a button to edit the books information
2. The system switches to “edit mode”, and now all information fields are editable
3. This makes the “delete” button available, and the admin clicks it
4. The system will ask the admin to confirm
5. The admin clicks again to confirm
6. The system erases the books information

Xref: Section 3.2.3, Delete book

Use case: **Add book**
Diagram:



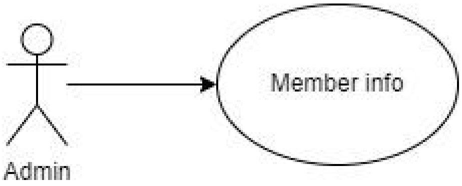
Brief Description
The admin has the ability to add members into the system.

Initial Step-By-Step Description
Before this use case can be initiated, the admin has already access to the library system

1. The admin clicks on a button to add a book
2. The system shows a page for the admin to enter the book's details
3. the admin to enter the book's details
4. The admin clicks the confirm button
5. The system adds the book to the system

Xref: Section 3.2.4, Add book

Use case: **View member info**
Diagram:



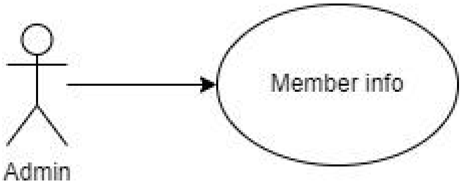
Brief Description
The admin has access to all the members in the system, they find a member and select them to see all their information

Initial Step-By-Step Description
Before this use case can be initiated, the admin has already accessed the library system interface.

1. The admin can search through the catalogue using keywords from a member's info.
2. The system displays the members that match the keywords to the Admin
3. The Admin selected a member
4. The system presents the information to the admin

Xref: Section 3.2.5, View member info

Use case: **Edit member info**
Diagram:



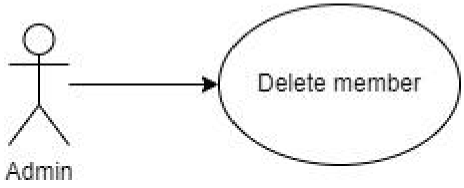
Brief Description
The admin has access to all the members in the system, they find a member and select them to see all their information and can also edit that information.

Initial Step-By-Step Description
Before this use case can be initiated, the admin has already accessed the info page of the member they want to edit

1. The admin clicks on a button to edit the members information
2. The system switches to “edit mode”, and now all information fields are editable
3. After editing the admin clicks on a button to save the changes
4. The system saves the new changes and switched back to “view mode”

Xref: Section 3.2.6, Edit member info

Use case: **Delete member**
Diagram:



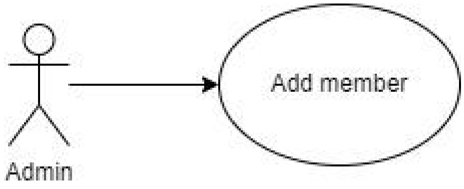
Brief Description
The admin has access to all the members in the system, they find a member and select them to see all their information and can also delete that information.

Initial Step-By-Step Description
Before this use case can be initiated, the admin has already accessed the info page of the member they want to delete

1. The admin clicks on a button to edit the member’s information
2. The system switches to “edit mode”, and now all information fields are editable
3. This makes the “delete” button available, and the admin clicks it
4. The system will ask the admin to confirm
5. The admin clicks again to confirm
6. The system erases the members information

Xref: Section 3.2.7, Delete member

Use case: **Add member**
Diagram:



Brief Description
The admin has the ability to add members into the system.

Initial Step-By-Step Description

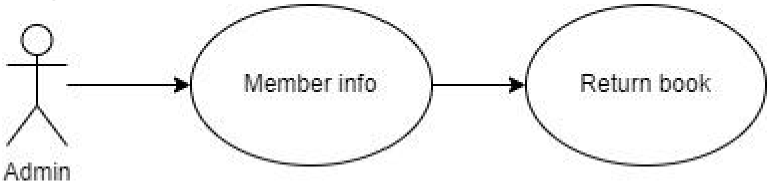
Before this use case can be initiated, the admin has already access to the library system

1. The admin clicks on a button to add a member
2. The system shows a page for the admin to enter the member's details
3. the admin to enter the member's details
4. The admin clicks the confirm button
5. The system adds the member to the system

Xref: Section 3.2.8, Add member

Use case: **Return book**

Diagram:



Brief Description.

The admin has the ability to set loaned books as returned on the system

Initial Step-By-Step Description

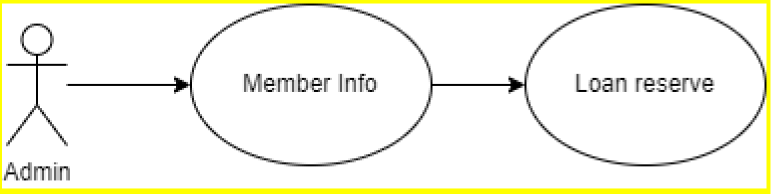
Before this use case can be initiated, the admin has already accessed a member's information which has a list of their loaned and reserved books.

1. The admin clicks a button to set the book as "returned"
2. The system will ask the admin to confirm
3. The admin clicks agin
4. The system removes the book from the member's loaned page.

Xref: Section 3.2.9, Return book

Use case: **Loan Reserve**

Diagram:



Brief Description.

The admin has the ability to set loan out reserved books on the system

Initial Step-By-Step Description

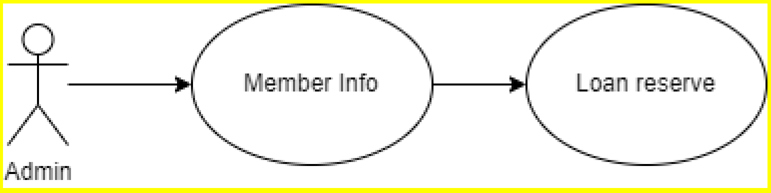
Before this use case can be initiated, the admin has already accessed a member's information which has a list of their loaned and reserved books.

1. The admin clicks a button to set the book as "loaned"
2. The system will ask the admin to confirm
3. The admin clicks agin

4. The system removes the book from the member’s reserve page and adds it to their loan page

Xref: Section 3.2.9, Loan Reserve

Use case: **Cancel Reserve**
Diagram:



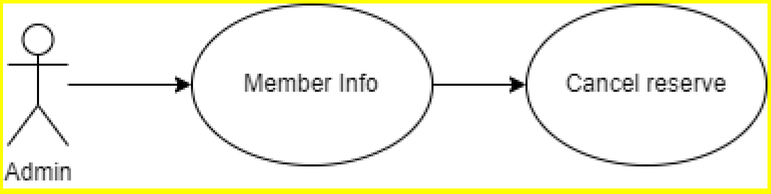
Brief Description.
The admin has the ability to set loan out reserved books on the system

Initial Step-By-Step Description
Before this use case can be initiated, the admin has already accessed a member’s information which has a list of their loaned and reserved books.

1. The admin clicks a button to cancel the member’s reserve
2. The system will ask the admin to confirm
3. The admin clicks agin
4. The system removes the book from the member’s reserve page.

Xref: Section 3.2.9, Cancel reserve

Use case: **Renew Loan**
Diagram:



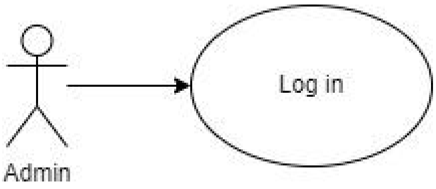
Brief Description.
The admin has the ability to renew loaned books’ due dates on the system

Initial Step-By-Step Description
Before this use case can be initiated, the admin has already accessed a member’s information which has a list of their loaned and reserved books.

1. The admin clicks a button to renew the loan
2. The system will ask the admin to confirm
3. The admin clicks agin
4. The system increases the loan’s due date.

Xref: Section 3.2.9, Renew Loan

Use case: **Login**
Diagram:



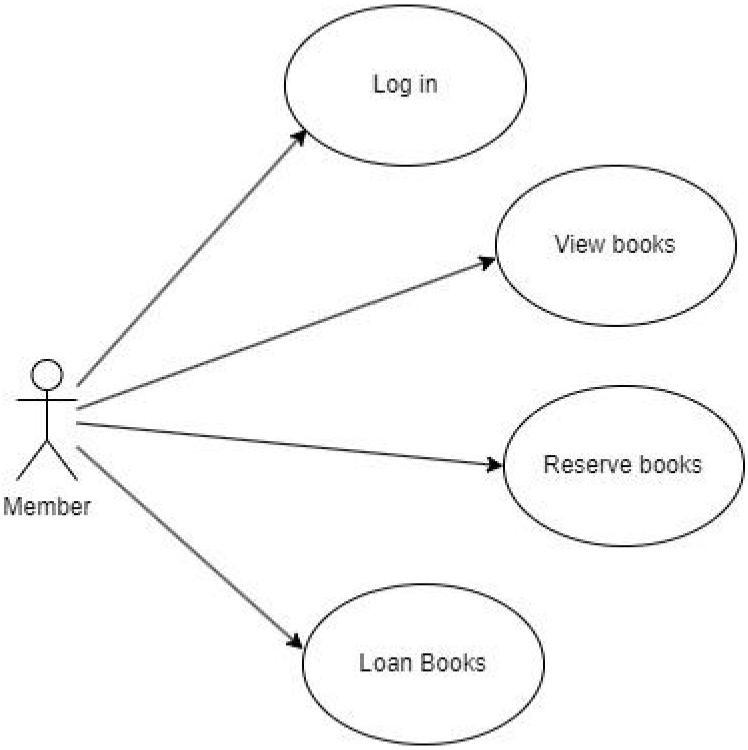
Brief Description
The admin can login to the library using a set password

Initial Step-By-Step Description
Before this use case can be initiated the admin has accessed the login screen of the library system.

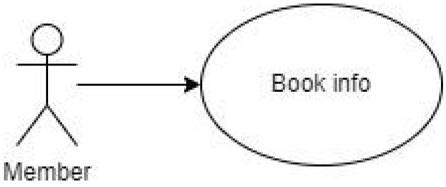
1. The Admin clicks the “login as admin” button
1. The Admin inputs the password
2. System checks if the password is correct
3. System opens the admin’s homepage

Xref: Section 3.2.10, Login (Admin)

2.2.2 Member use cases



Use case: **View book**
Diagram:

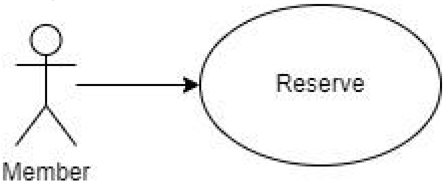


Brief Description

The user can view all books through the catalogue and click on them to get access to more information about them.

Xref: Section 3.2.11, View book (Member)

Use case: **Reserve book**
Diagram:



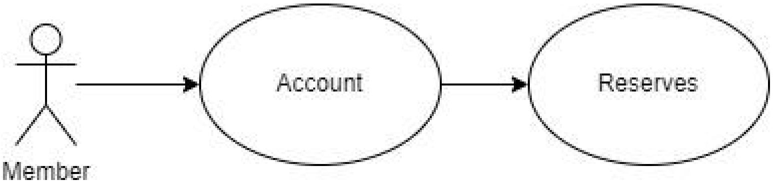
Brief Description
The member can view all books and can choose to set a reservation on them.

Initial Step-By-Step Description
Before this use case can be initiated, the member has found a book through the catalogue. This function can be accessed by clicking into the book or just viewing it in the catalogue.

1. The member clicks the "reserve" button
2. The system shows the member all the locations for all the available copies
3. The member chooses the location they want to pick up from
4. The system sets the book to be reserved

Xref: Section 3.2.12, Reserve book

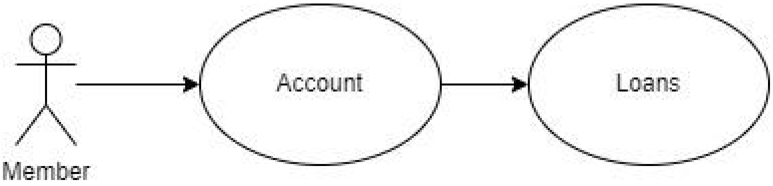
Use case: **View reserves**
Diagram:



Brief Description
The member can view a list of all their reserves through their account page.

Xref: Section 3.2.13, View reserves

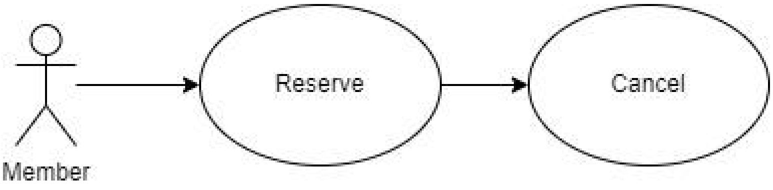
Use case: **View loans**
Diagram:



Brief Description
The member can view a list of all their current book loans through their account page.

Xref: Section 3.2.14, View loans

Use case: **Cancel reserve**
Diagram:



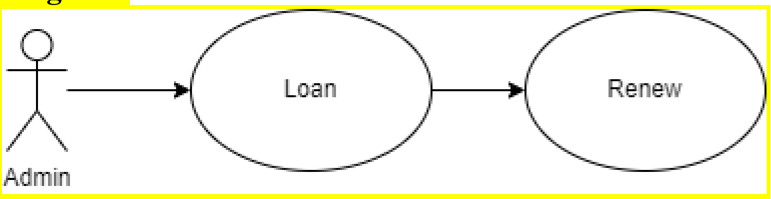
Brief Description
The member can cancel a reserve they have set on a book through their account page

Initial Step-By-Step Description
Before this use case can be initiated the member has accessed their account page which shows their current reserves.

1. The member clicks the "cancel" button next to the reserved book
2. The system will ask the member to confirm the cancel
3. The member clicks agin
4. The system removes the book from the member's reservation page and removes the reserve

Xref: Section 3.2.15, Cancel reserve

Use case: **Renew loan**
Diagram:



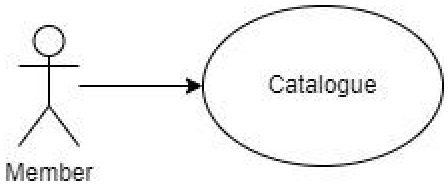
Brief Description
The member can renew a loan through their account page

Initial Step-By-Step Description
Before this use case can be initiated the member has accessed their account page which shows their current loans.

1. The member clicks the "renew" button next to the loaned book
2. The system will ask the member to confirm the renew
3. The member clicks agin
4. The system increases the book's due date

Xref: Section 3.2.15, Renew loan (member)

Use case: **View catalogue**
Diagram:

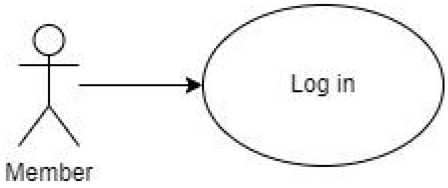


Brief Description
The member can view the a catalogue of all the books in the library

Initial Step-By-Step Description
Before this use case can be initiated the member has logged into their account and then the system displays the catalogue.

Xref: Section 3.2.16, View catalogue

Use case: **Login**
Diagram:



Brief Description
The member can login to the library using their email and password.

Initial Step-By-Step Description
Before this use case can be initiated the member has accessed the login screen of the library system.

4. Member inputs their login details
5. System checks if the details are correct
6. System opens the homepage

Xref: Section 3.2.17, Login (Member)

2.3 User Characteristics

The Admin user is expected to be computer and internet literate; able to fill out forms and use industry/professional-level software that requires some training. It is expected they will have a focus on work productivity and completing tasks at a fast rate. Admin users will also be familiar with library operations and the use of ISBNs and call numbers.

The Member user encompasses a broad range of library members; from children to elderly. Members cannot be assumed to have high computer literacy but should be assumed to have at least very basic familiarity with a simple web page, and able to use a search bar; scroll through results, and click on buttons to reserve or renew books.

2.4 Non-Functional Requirements

2.4.1 User non-functional requirements

Admin users require a utility-focused UX prioritised for speedy workflow. Security for admins should be access-all with "are you sure" checks for deleting members or books. Visual design should be clean, consistent and readable. Member users require an intuitive, instructional-focused UX where ease of use is prioritised. Security for users should allow access to the user's data only, with password protection. User visual design should aid in intuitive use.

2.4.2 Developer non-functional requirements

The developer team will use a waterfall/agile hybrid process model. Trello will be used for task management; Microsoft teams will be used for inter-team communications. Visual Studio will be the IDE used for development. GIT will be used for version control and hosted on Github. Figma will be used for visual design and testing.

3.0 Requirements Specifications

3.1 External Interface Requirements

3.2 Functional Requirements

The logical structure of the data is contain in section 2.2.

3.2.1 View book Info

Use Case Name	View book info
XRef	Section 2.2.1, View book info
Trigger	The Admin has clicked on a book in the book list
Precondition	The Admin has accessed the book list page
Basic Path	1. The admin uses the search-bar to search through the book list. 2. The system displays the options that match the keywords to the Admin 3. The Admin selects a book
Alternative Paths	1. The admin selects a book without using the search-bar
Postcondition	The system presents the book information to the admin
Exception Paths	The Admin may abandon the operation at any time.
Other	The book information includes the title, author name, genre, book type, summary, members who have reserved the book, members who have loaned the book.

3.2.2 Edit book Info

Use Case Name	Edit book info
XRef	Section 2.2.1, Edit book info
Trigger	The Admin has clicked on the “edit” button while viewing a book
Precondition	The Admin has accessed the book info page
Basic Path	1. The system switches to “edit mode”, and now all information fields are editable 2. After editing the admin clicks on a button to save the changes
Alternative Paths	None

Postcondition	The system saves the new changes and switched back to “view mode”
Exception Paths	The Admin may abandon the operation at any time by clicking the “cancel” or “back” button.
Other	The book information includes the title, author name, genre, book type, summary, members who have reserved the book, members who have loaned the book.

3.2.3 Delete book

Use Case Name	Delete book
XRef	Section 2.2.1, Delete book
Trigger	The Admin has clicked on the “delete” button while editing a book
Precondition	The Admin has accessed the book info page and is in “edit mode”
Basic Path	1. The system will ask the admin to confirm. 2. The admin clicks the button again
Alternative Paths	None
Postcondition	The system deletes the book and takes the admin back to the book list page.
Exception Paths	The Admin may abandon the operation at any time.
Other	The book information includes the title, author name, genre, book type, summary, members who have reserved the book, members who have loaned the book.

3.2.4 Add book

Use Case Name	Add book
XRef	Section 2.2.1, Add book
Trigger	The Admin has clicked on the “add book” button
Precondition	The Admin has accessed the book listpage.
Basic Path	1. The system shows a page for the admin to enter the book’s details 2. the admin to enter the book’s details 3. The admin clicks the confirm button
Alternative Paths	None

Postcondition	The system adds the book to the system and takes the admin back to the book list page.
Exception Paths	The Admin may abandon the operation at any time by clicking “back”
Other	The book information includes the title, author name, genre, book type, summary, members who have reserved the book, members who have loaned the book.

3.2.5 View member Info

Use Case Name	View member info
XRef	Section …
Trigger	The Admin has clicked on a member in the list
Precondition	The Admin has accessed the member list page
Basic Path	1. The admin uses the search-bar to search through the member database. 2. The system displays the options that match the keywords to the Admin 3. The Admin selects a member
Alternative Paths	1. The admin selects a member without using the search-bar
Postcondition	The system presents the book information to the admin
Exception Paths	The Admin may abandon the operation at any time.
Other	The member information includes the members first and last name, their email, their password, their reserves and their loans.

3.2.6 Edit member Info

Use Case Name	Edit member info
XRef	Section 2.2.1, Edit member info
Trigger	The Admin has clicked on the “edit” button while viewing a member
Precondition	The Admin has accessed the member info page
Basic Path	1. The system switches to “edit mode”, and now all information fields are editable 2. After editing the admin clicks on a button to save the changes
Alternative Paths	None

Postcondition	The system saves the new changes and switched back to “view mode”
Exception Paths	The Admin may abandon the operation at any time by clicking the “cancel” or “back” button.
Other	The member information includes the members first and last name, their email, their password, their reserves and their loans.

3.2.7 Delete member

Use Case Name	Delete member
XRef	Section …
Trigger	The Admin has clicked on the “delete” button while editing a member
Precondition	The Admin has accessed the member info page and is in “edit mode”
Basic Path	1. The system will ask the admin to confirm. 2. The admin clicks the button again
Alternative Paths	None
Postcondition	The system deletes the member and goes back to the member list page
Exception Paths	The Admin may abandon the operation at any time.
Other	The member information includes the members first and last name, their email, their password, their reserves and their loans.

3.2.8 Add member

Use Case Name	Add member
XRef	Section 2.2.1, Add member
Trigger	The Admin has clicked on the “add member” button
Precondition	The Admin has accessed the member list page.
Basic Path	1. The system shows a page for the admin to enter the member’s details 2. the admin enters the members’s details 3. The admin clicks the confirm button
Alternative Paths	None
Postcondition	The member information includes the members first and last

	name, their email, their password, their reserves and their loans.
Exception Paths	The Admin may abandon the operation at any time by clicking "back"
Other	The book information includes the title, author name, genre, book type, summary, members who have reserved the book, members who have loaned the book.

3.2.9 Return book

Use Case Name	Return book
XRef	Section …
Trigger	The admin clicks the "return" button next to a member's loaned book
Precondition	The Admin has accessed a member's information who have a book loaned
Basic Path	1. The system will ask the admin to confirm 2. The admin will click again 3. The system sets the book as returned 4. The book is removed from the member's loaned
Alternative Paths	None
Postcondition	The member information includes the members first and last name, their email, their password, their reserves and their loans.
Exception Paths	The Admin may abandon the operation at any time. The member may not have any loaned books.
Other	The book information includes the title, author name, genre, book type, summary, members who have reserved the book, members who have loaned the book.

3.2.10 Log in (Admin)

Use Case Name	Log in
XRef	Section 2.2.1, Log in
Trigger	The admin clicks the "log-in as admin" button on the login screen
Precondition	The Admin has accessed the log-in screen.
Basic Path	1. The system will ask the user to input the admin password 2. The system will check if the password is correct
Alternative Paths	None

Postcondition	The Admin is taken to their homepage
Exception Paths	The Admin may abandon the operation at any time.
Other	None

3.2.11 View book (Member)

Use Case Name	View book
XRef	Section 2.2.2, View book
Trigger	The admin clicks the “return” button next to a member’s loaned book
Precondition	The Admin has accessed a member’s information who have a book loaned
Basic Path	5. The system will ask the admin to confirm 6. The admin will click again 7. The system sets the book as returned 8. The book is removed from the member’s loaned
Alternative Paths	None
Postcondition	The member information includes the members first and last name, their email, their password, their reserves and their loans.
Exception Paths	The member may abandon the operation at any time. The member may not have any loaned books.
Other	The book information includes the title, author name, genre, book type, summary

3.2.12 Reserve book

Use Case Name	Reserve book
XRef	Section 2.2.2, Reserve book
Trigger	The member clicks the “reserve” button on a book.
Precondition	The member has access to the book catalogue
Basic Path	1. The system shows the member all the locations for all the available copies 2. The member chooses the location they want to pick up from
Alternative Paths	1. The member clicks into the book info page first 2. The member clicks the “reserve button”

	3. The system shows the member all the locations for all the available copies 4. The member chooses the location they want to pick up from
Postcondition	The system sets the book as reserved.
Exception Paths	The member may abandon the operation at any time.
Other	None

3.2.13 View reserves

Use Case Name	View reserves
XRef	Section …
Trigger	The member clicks on their account page
Precondition	The member has reserved books
Basic Path	The system shows a list of all the reserved books the member has.
Alternative Paths	None
Postcondition	None
Exception Paths	The member may abandon the operation at any time.
Other	The information for the each reserved will be the book title, author, cover, reserved date and available date

3.2.14 View loans

Use Case Name	View loans
XRef	Section 2.2.2, View loans
Trigger	The member clicks on their account page
Precondition	The member has loaned books
Basic Path	The system shows a list of all the loaned books the member has.
Alternative Paths	None
Postcondition	None
Exception Paths	The member may abandon the operation at any time.
Other	The information for each loan will be the book title, author, cover, loan date and due date.

3.2.15 Cancel reserve

Use Case Name	Cancel reserve
XRef	Section 2.2.2, Cancel reserve
Trigger	The member clicks the “cancel” button next to the reserved book they want to cancel.
Precondition	The member has a reserved book.
Basic Path	1. The system asks the member to confirm 2. The member clicks again
Alternative Paths	None
Postcondition	3. The book is removed from the member’s reserves section
Exception Paths	The member may abandon the operation at any time.
Other	The information for each reservation will be the book title, author, cover, reserved date and availability date.

3.2.16 View catalogue

Use Case Name	View catalogue
XRef	Section 2.2.2, View catalogue
Trigger	The member logs into the system
Precondition	The member has access to the system
Basic Path	The member has access to the homepage which has the catalogue after they log in.
Alternative Paths	None
Postcondition	None
Exception Paths	The member may abandon the operation at any time.
Other	None

3.2.17 Login (Member)

Use Case Name	Log in
XRef	Section 2.2.2, Log in
Trigger	The member as accessed the log in screen

Precondition	The member has accessed the login screen.
Basic Path	1. The member will input their account details 2. The system will check if the details is correct
Alternative Paths	None
Postcondition	The member is taken to their homepage
Exception Paths	The member may abandon the operation at any time.
Other	None

3.3 Detailed Non Functional Requirements

3.3.1 Admin users

Utility over intuitively: Interface should emphasise the speed of use and the rate of task turnover that a skilled user can achieve; rather than making the interface intuitive for new users. This is because the admin interface is a professional-level piece of software used in a work environment, where initial training is a worthy tradeoff to achieve high rates of work.

Clear and consistent visual design: The user interface should emphasise functional design over aesthetics. Colour choices should be functional and easy on the eyes, as admin users may be using this interface for much of their workday. Consistent colour choices should be used to identify functionality.

3.3.2 Security

Admin users should have access to all books and all library patrons, with edit and delete functions. Deletion options should ask the user to verify their choice before executing. Edit features should balance speed of use with preventing accidental edits.

3.3.3 Member users

Intuitive design emphasised over speed of use: Library patrons will not be using the programme all day as a part of their job, so speed-of-use is less important, however they cannot be given training on the software, so it should be easy to figure out and guide users to the features they need.

Clear and consistent visual design: Again, GUI colour choices and visual design should be clear, readable, and consistent. Being easy on the eyes is less important than guiding users towards the right buttons, text entry fields etc.

3.3.4 Security

patron users should only be able to access their own data, and only able to make limited changes to it as specified in functional requirements. “Are you sure” checks to prevent accidental use of options should be implemented more liberally.

3.3.4 Version Control

GIT protocol will be used for version control during development. GitHub will be used to host the data while the software product is in development.

3.3.5 Team management and communication

Microsoft Teams will be used for inter-team direct communications; in-person meetings and huddles will be held a minimum of three times a week during the active development phase, and team members are encouraged to work on-site.

Trello will be used to manage tasks following Agile management protocol.

3.3.6 Project Management

A waterfall process model will be used to manage the overall project, with Agile used to manage the team’s work between milestones.

3.3.7 UX design, development and testing

Low-fidelity and Hi-fidelity wireframes will be built and used for user testing before developing the final UX and UI specifications. A detailed style guide will then convey these requirements to the development team. Figma will be used for the development, prototyping and testing process.

3.3.8 Documentation control and management:

Google Docs will be used to host documentation for the team. Edit controls will be applied as appropriate.