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B.TECH. (CSE)
VI SEMESTER

**UE18CS355 – OBJECT ORIENTED ANALYSIS AND DESIGN WITH
SOFTWARE ENGINEERING LABORATORY**

PROJECT REPORT

ON

E-BOOK MANAGEMENT SYSTEM

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ABSTRACT

This project is aimed at building a simple E-Book Management system, one much like an “online library” or a “virtual library”. The book management portal will provide a user-friendly interface to store and maintain details of members or users and the books. It will also facilitate easy access to books. Functionalities like “login and register”, “search for book”, “update library”, and “borrow book” will be added for ease of usage.

The purpose of this E-Book Management System is to provide to the target users, the access and subscription to the required books either free or at a prescribed cost for a defined amount of time. The user interface allows finding books based on his/her preferences and subscribing to the same according to the applicable rules. The application also allows the administrator to keep track of the available books and filter them based on various criteria thereby making it more user-friendly.

1 SRS

1.1 INTRODUCTION

1.1.1 Purpose

The primary aim of the document is to represent the requirements of the project, E-Book Management System. This document gives the detailed description of both functional and non-functional requirements. The main purpose is to provide a user-friendly environment to maintain the details of the users, books and enable easy and convenient access to books.

1.1.2 Intended Audience

The document is proposed for the system developers, University and public Librarians, administration faculty of the Education Department and to whosoever is interested.

1.1 Product Scope

E - Book Management System can also be referred to as an 'Online Library' or a 'Virtual Library'. The purpose is to provide to the target users, the access and subscription to the required books either free or at a prescribed cost for a defined amount of time. The user interface allows finding books based on his/her preferences and subscribing to the same according to the applicable rules.

The application also allows the administrator to keep track of the available books and filter them based on various criteria thereby making it more user-friendly.

1.1.3 References

Books:

- "Software Engineering: Principles and Practice", Hans van Vliet 3rd edition Wiley India 2010
- "Software Requirements and Specifications: A Lexicon of Practice, Principles", Michael J. Jackson and Michael Jackson

Websites:

- <https://www.slideshare.net/>
- <https://www.krazytech.com>

1.2 OVERALL DESCRIPTION

1.2.1 Product Perspective

E - Book Management System is a virtual bookstore/library application which mainly gains popularity because of its online feature and it supports a number of functions for both the users and the stores. It can be proposed as a follow-on member of existing Online E-Book systems with a few additional features which are lacking in the current versions.

1.2.2 Product Functions

The Product Functions include the following interfaces:

1.2.3 The 'Library'

- ☐ Searching for books
- ☐ Search Refinement by Categories, language, publication, availability etc
 - On clicking a book
 - Look into ratings/reviews
 - Borrow the book
 - Return the book

1.2.4 Bookshelf - Books you 'borrowed'

- List of the books
- Book Info (Title, Author, Ratings, Review)

1.2.5 Book Interface

- Bookmarking

1.2.6 Account Info

- User info

1.2.7 User Classes and Characteristics

- ☐ Libraries
 - Providing the books

Software Requirement Specification for eBook Management System

☐ Users

- “Borrowing” the books
- Leaving Reviews & Ratings
- Book Interface
 - Bookmarking

1.2.8 Operating Environment

The designed application would operate well in all the existing operating system (Mac OS).

The hardware configuration includes PROCESSOR: Pentium(R) Dual Core-CPU

HARD DISK: 40 GB, basic I/O devices like keyboard, mouse, monitor screen.

Access to good internet connection is one of the vital requirements for the application.

1.2.8.1 Design and Implementation Constraints

- ☐ Protection of the application against threats and vulnerabilities.
- ☐ Maintenance of the confidentiality and integrity of the data.
- ☐ Timely updates about the books and users must be made.

1.2.9 Assumptions and Dependencies

The assumptions include:

- ☐ User-friendly application.
- ☐ Data about users and books must be recorded and accessible by the users according to their levels of access.
- ☐ Confidentiality, Integrity and Availability of data is preserved.
- ☐ Ubiquitous, high storage, fast and on-demand access to the applications' resources.
- ☐ Constantly running and no failure data server and warehouse. The dependencies include:
 - The specific hardware and software requirements for the application to run.
 - The users should have a proper understanding of the features in order to use it.
 - Timely addition, updating and deletion feature.
 - The application should have a general stored report.

1.4 EXTERNAL INTERFACE REQUIREMENTS

1.4.1 User Interfaces

There are two levels of interfaces:

1.4.1.1 ADMINISTRATOR MODE:

- ☐ Register user
- ☐ Enter Book Details
- ☐ Issue a Book
- ☐ Resolve Conflicts

1.4.1.2 USER MODE:

A user can be previously registered or can register on spot A user can:

- ☐ Check the availability of books
- ☐ Borrow a book
- ☐ Return a book

1.4.2 Software Interfaces

Front end development requirements:

- ☐ Python Tkinter

Back-end requirements:

- ☐ Python
- ☐ SQLite Database

Operating System Requirements:

- ☐ Mac OS 10.15 or above (Development)

1.4.3 Communication Interfaces

HTTP for accessing the books to be downloaded onto the User's device.

Software Requirement Specification for eBook Management System

1.4.4 Hardware Interfaces

PROCESSOR: Pentium(R) Dual Core-CPU HARD DISK: 40 GB

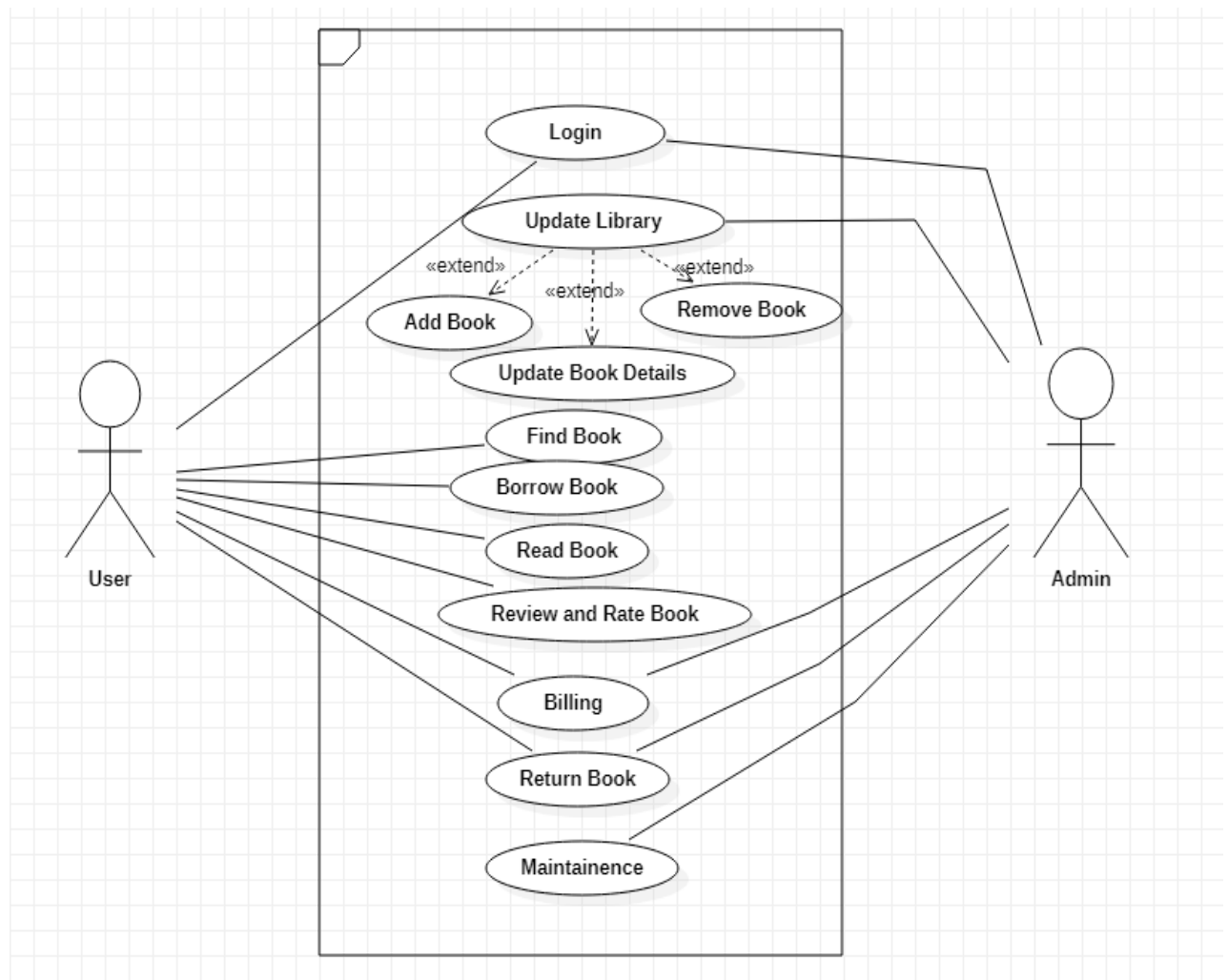
RAM: 256 MB or more

OPERATING SYSTEM: Mac 10.15 & above

1.5 ANALYSIS MODELS

1.5.1 USE CASE DIAGRAM: -

A use case diagram at its simplest is a representation of a user's interaction with the system that shows the relationship between the user and the different use cases in which the user is involved



1.6 SYSTEM FEATURES

1.6.1 User Authentication

1. Description and Priority

User authentication is a security process that covers all of the human-to-computer interactions that require the user to register and log in. Said more simply, authentication asks each user, “who are you?” and verifies their response.

Priority: High

2. Stimulus/Response Sequences

User Authentication is common to both modes of interface.

A new user provides valid credentials which would lead to their registration. Registered users can login using their username & password.

3. Functional Requirements

REQ-1: New users to the application would have to register themselves by providing the required information asked for and they are validated in order to prevent conflicts within the same.

REQ-2: Registered users can login successfully by providing valid credentials and would lead the user to the Homepage of the application.

REQ-3: Unsuccessful login with invalid credentials would lead to an error message and another attempt for the same.

1.6.2 Finding Books

1. Description and Priority

A user can search through the online catalogue available to them and find books pertaining to their interests.

Priority: Medium

2. Stimulus/Response Sequences

A search box to enable the user to enter a particular title and find it. A filter option to refine the search results.

3. Functional Requirements

REQ-1: A search box is implemented where the user types in key terms pertaining to their book, and the search delivers its response as a set of results.

REQ-2: The search can be filtered by various criteria such as genre, publications, price range, language etc., according to the user's preference.

1.6.4 Subscribing Plans

1. Description and Priority

A user can have a subscription plan that will allow them to borrow books from the library for a set period of time.

Priority: High

2. Stimulus/Response Sequences

Page containing features/information of the Subscription Plan including

- Plan Description
- Monthly Validity
- Price

The user can choose a subscription plan and subscribe to a book. The book would be available to read once the user subscribes to a plan.

3. Functional Requirements

REQ-1: Choice of subscription plans (according to the book)

REQ-4: To choose a subscription plan, and upon success, the books are made available to the user for reading.

1.6.5 Reading the Book

1. Description and Priority

This feature allows the users to read the book in their native book readers.

Priority: Low

2. Stimulus/Response Sequences

Bookmarking – Saving the last page read, for user to keep track

Reading book in native reader of choice

3. Functional Requirements

REQ-1: The user is allowed to read the book and perform any functions provided by the native reader.

REQ-3: The user can bookmark pages to look into later.

1.7 OTHER NON-FUNCTIONAL REQUIREMENTS

1.7.1 Performance Requirements

- ☐ The performance of the system must be fast and accurate.
- ☐ The management system must be able to handle expected and unexpected errors, Eg. Inbuilt error testing to identify invalid username/password.

Software Requirement Specification for eBook Management System

- ☐ The system should be able to handle large amounts of data. It must accommodate a high number of books and users without faults.
- ☐ The information is refreshed depending upon whether some updates have occurred or not in the application. The system shall respond to the member in not less than two seconds from the time of the request submittal.
- ☐ The system shall be allowed to take more time when doing large processing jobs.

1.7.2 Safety Requirements

- ☐ Maintaining the database is one of the key responsibilities of the proposed E-Book Management System.
- ☐ The database may crash at any point of time and reason could be virus or operating system failure. Having a database backup and recovery system is vital.
- ☐ Proper UPS / inverter facility should also be there in case of power supply failure.

1.7.3 Security Requirements

- ☐ System uses a secured database.
- ☐ System will have different types of users and every user has access constraints.
- ☐ Proper user authentication should be provided.
- ☐ There should be separate accounts for admin and members such that no member can access the database and only admin has the rights to update the database.

1.7.4 Software Quality Attributes

- ☐ Admins will have the right to create changes to the system, but the members or other users cannot do changes.
- ☐ The Quality of the database is maintained in such a way so that it can be very user friendly to all the users of the database.
- ☐ The user is able to easily download and install the system.

1.7.5 Business Rules

A business rule is anything that captures and implements business policies and practices. A rule can enforce business policy, make a decision or infer new data from existing data. This includes the rules and regulations that the application users must abide by. May also include the cost and the discount prices offered. Neither the user nor the admin should involve in illegal activities by crossing the rules.

1.8 OTHER REQUIREMENTS

The additional requirements include:

- Well documented legalized business rules.
- Always on server in the data centers.
- High storage and fast access database.

1.9 APPENDIX A: GLOSSARY

1. E-Book – Electronic book - book publication made available in digital form, consisting of text, images, or both, readable on electronic devices.
2. Bookmark – record the address of (a website, file, etc.) to enable quick access in future.
3. Personalization / Customization – the act of designing for individual requirements.
4. Confidentiality – the state of keeping or being kept secret or private.
5. Integrity – the quality of being honest and having strong moral principles.
6. Availability – the quality of being able to be used or obtained.
7. Dependency – the degree to which each program module relies on each one of the other modules.
8. Ubiquitous – existing or being everywhere at the same time.
9. Authentication – Ability of the system to confirm the identity of the user.
10. Stimulus – something that provokes or causes an action or response.
11. Credentials – testimonials or certified documents showing that a person is entitled to credit or has a right to exercise official power
12. Subscription – an arrangement to receive something, typically a publication, regularly by paying in advance.
13. Licensing – a business arrangement in which one company gives another company permission to manufacture its product for a specified payment.
14. Patenting – a form of intellectual property that gives its owner the legal right to exclude others from making, using, or selling an invention for a limited period of years in exchange for publishing an enabling public disclosure of the invention.

1.10 APPENDIX B: FIELD LAYOUTS

An Excel sheet containing field layouts and properties/attributes and report requirements.

1.10.1 Sample sheet with the information required to register the user: -

Field	Length	Data Type	Description	Mandatory
Sl. No	4	Numeric	Incremental Number for records purpose	Y
Customer Name	50	String	Name of User	Y
E-Mail ID	30	Alphanumeric	Mail ID of user	Y
Unique ID	5	Numeric	Unique Identifier assigned to each user	Y
Mobile No	10	Numeric	Mobile number of users	N
Age	2	Numeric	Age of user	N
Account Username	50	Alphanumeric	Account information	Y

1.10.2 Sample Report Requirements: -

Registration Report	Subscription Report
Sl. No	Unique ID
Customer Name	Subscription Plan
E-Mail ID	List of books currently subscribed to
Unique ID	Amount Payable
Mobile No	Subscription Timeline
Age	Transaction Details
Account Username	Remarks

1.11 APPENDIX C: REQUIREMENT TRACEABILITY MATRIX

Sl. No	Requirement ID	Brief Description of Requirement	Architecture Reference	Design Reference	Code File Reference	Test Case ID	System Test Case ID
1	REQ#1	Updating details of a book in the system	2.2.3	2.4.1, 4.2 & 4.5	Database	U_46 – U_52 & U_55 – U_58	U_46 – U_52 & U_55 – U_58 (GUI)
2	REQ#2	Deleting an existing book in the system	2.2.3	2.4.1, 4.2 & 4.5	Database	U_32 – U_35	U_32 – U_35 (GUI)
3	REQ#3	Adding a new book to the catalogue	2.2.3	2.4.1, 4.2 & 4.5	Database	U_16 – U_24	U_16 – U_24 (GUI)

2 PROJECT PLAN

2.1 1: IDENTIFY THE LIFECYCLE TO BE FOLLOWED FOR THE EXECUTION OF YOUR PROJECT AND JUSTIFY WHY U HAVE CHOSEN THE MODEL.

The lifecycle selected is an Iterative approach.

An Iterative approach has been selected as it is most fitting for our project requirements and objectives. Some of the factors involved in deciding the Lifecycle approach has been listed in the table below along with how well each of the approach fares pertaining to a specific factor.

FACTORS	Waterfall	v. Shaped	Prototyping	Iterative	Incremental	Agile
Unclear User Requirement	Poor	Poor	Good	Good	Poor	Excellent
Reliable System	Good	Good	Poor	Good	Good	Good
Short Time Schedule	Poor	Poor	Good	Excellent	Excellent	Poor
Cost Limitations	Poor	Poor	Poor	Excellent	Good	Excellent
Visibility of Stakeholders	Good	Good	Excellent	Good	Excellent	Good
Component Reusability	Good	Good	Poor	Excellent	Good	Poor
Documentation	Excellent	Excellent	Good	Excellent	Excellent	Poor

Our project is a simple implementation of an online book management system with many reusable components, almost clear-cut user requirements and well-defined user-interface. These factors allow for the product to be built in multiple iterations wherein each iteration can incorporate the user's feedback and requirements. This is a cost effective and easy method to test and debug in each of the smaller iterations.

After considering all of the above factors, an iterative approach seemed to be the best fit for our project implementation as this approach caters to all of the project needs.

2.2 2: IDENTIFY THE TOOLS WHICH U WANT TO USE IT THROUGHOUT THE LIFECYCLE LIKE PLANNING TOOL, DESIGN TOOL, VERSION CONTROL, DEVELOPMENT TOOL, BUG TRACKING, TESTING TOOL.

The following tools are thought of to be used throughout the lifecycle:

1. **Planning Tools:**
2. **Design Tools:**
3. **Version Control Tools:**
4. **Development Tools:**
5. **Bug Tracking Tools:**
6. **Testing Tools:**

2.3 3: DETERMINE ALL THE DELIVERABLES AND CATEGORIZE THEM AS REUSE/BUILD COMPONENTS AND JUSTIFY THE SAME.

CBSE processes are software processes that support component-based software engineering. They take into account the possibilities of reuse and the different process activities involved in developing and using reusable components. There are two types of CBSE processes:

- **CBSE for reuse** is concerned with developing components or services that will be reused in other applications. It usually involves generalizing existing components.
- **CBSE with reuse** is the process of developing new applications using existing components and services.

For this project, we have focused on **CBSE with reuse** wherein widely available and popularly used components are 'reused' as per project requirements.

The following are the deliverables for this project in terms of components:

2.3.1 USER AUTHENTICATION:

TASK	CATEGORY	JUSTIFICATION
Sign Up Form	Reuse	Generic components like textboxes, dropdown lists and checkboxes needed for a sign-up form are widely used and easily available.
Login Page	Reuse	Generic components like textboxes, dropdown lists and checkboxes needed for a login page are widely used and easily available.

2.3.2 READING THE BOOK:

TASK	CATEGORY	JUSTIFICATION
Navigating through book	Build	Switching to a specific page as well as page-to-page navigation requires components like pagination, toggle switch, breadcrumb, etc which have to be built as per project requirements.
Customization	Build	Changing font size and toggling between dark/light reading modes require components like toggle switch, font size slider, etc which have to be built as per project requirements.

2.3.3 BOOK DETAILS:

TASK	CATEGORY	JUSTIFICATION
Display	Reuse	Displaying of basic information about the book including description, reviews, ratings need generic reusable components like textboxes, rating icons, etc.
User Interaction	Build	Submitting a rating/review requires customized components to promote better user interface.

2.3.4 BORROW BOOK:

TASK	CATEGORY	JUSTIFICATION
Billing	Reuse	Billing requires user credentials, payment method details, secure gateway etc. which are features used in most online ventures and hence easily available to reuse.
Adding Book to List	Build	Adding user-interested books to cart would require components like cart icon, books list table, etc which have to be built to incorporate better UI.

2.3.5 SEARCH BOOK:

TASK	CATEGORY	JUSTIFICATION
Matching & Displaying Queries	Reuse	Search boxes, query retrieval code, etc are widely used and easily available components
Filtering	Build	Filtering according to user interests would require customization of components.
Curating List	Build	A list of curated books aligning with users' preference requires customized components.

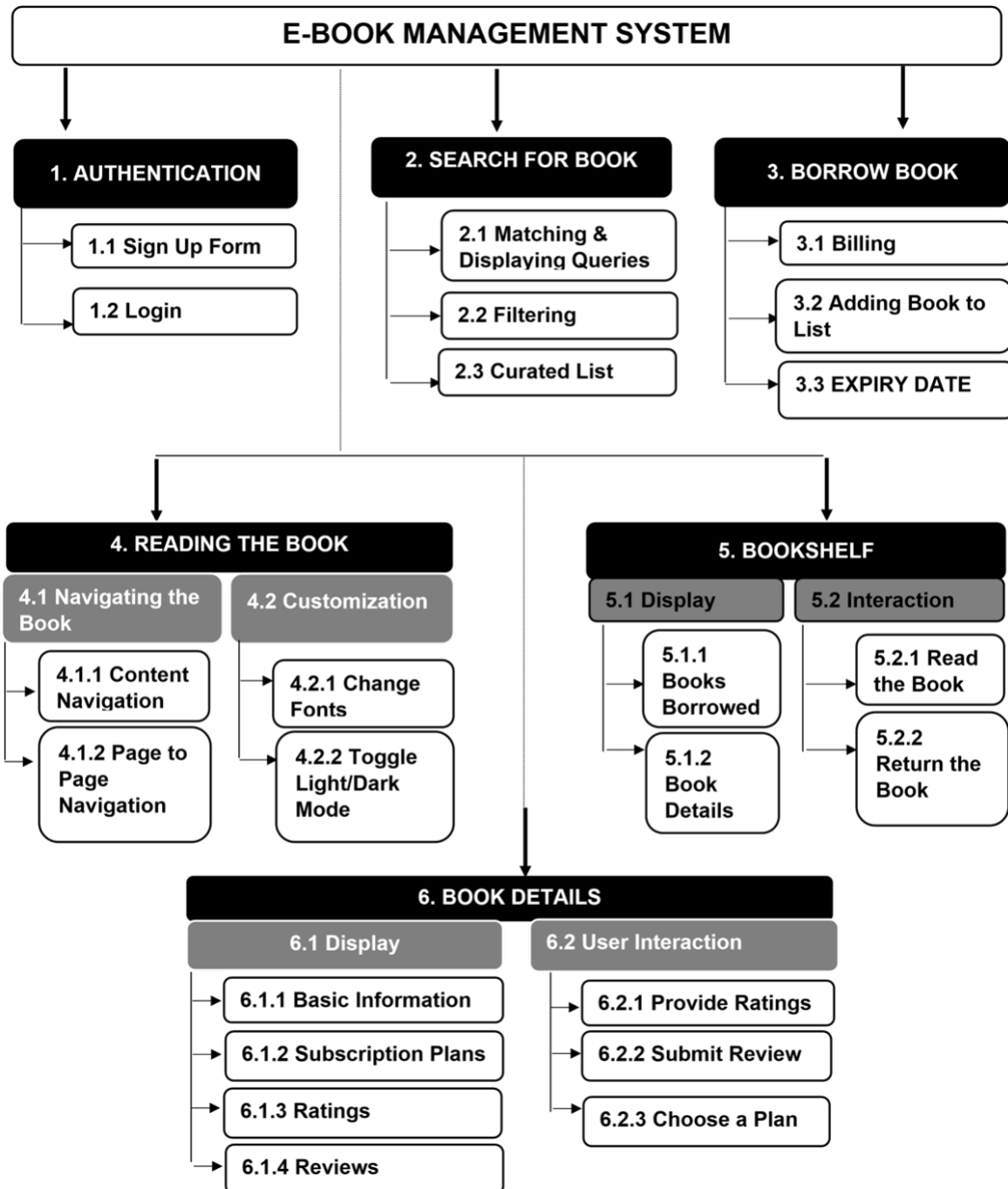
2.3.6 BOOKSHELF:

TASK	CATEGORY	JUSTIFICATION
Display	Reuse	Displaying details about borrowed books need generic components like textboxes, etc.
Interaction	Build	Reading and eventually returning the books need special components to track date, time, etc and hence need to be built.

2.4 CREATE A WBS FOR THE ENTIRE FUNCTIONALITIES IN DETAIL.

WBS – Work Breakdown Structure

A work-breakdown structure in project management and systems engineering, is a deliverable oriented breakdown of a project into smaller components. A work breakdown structure is a key project deliverable that organizes the team's work into manageable sections.



2.5 5: DO A ROUGH ESTIMATE OF EFFORT REQUIRED TO ACCOMPLISH EACH TASK IN TERMS OF PERSON MONTHS.

Based on the above WBS, we calculate the effort required to accomplish each task in terms of person months. The procedure we have used is as follows:

1. Each task is divided into subtasks.
2. Each task including its subtasks is expected to have **900 lines of code** i.e., **0.9KLOC** (Kilo Lines of Code) on an average.
3. Also, assuming the project to be of **Organic type** due to small team size and well understood problem, the value of constants is **$a_b=2.4$ and $b_b=1.05$** .
4. The formula to calculate the **Effort in Person Months** for an Organic Project is given by:

$$\text{Effort } E = a_b * (\text{KLOC})^{b_b}$$

$$\text{Effort } E = 2.4 * (\text{KLOC})^{1.05}$$

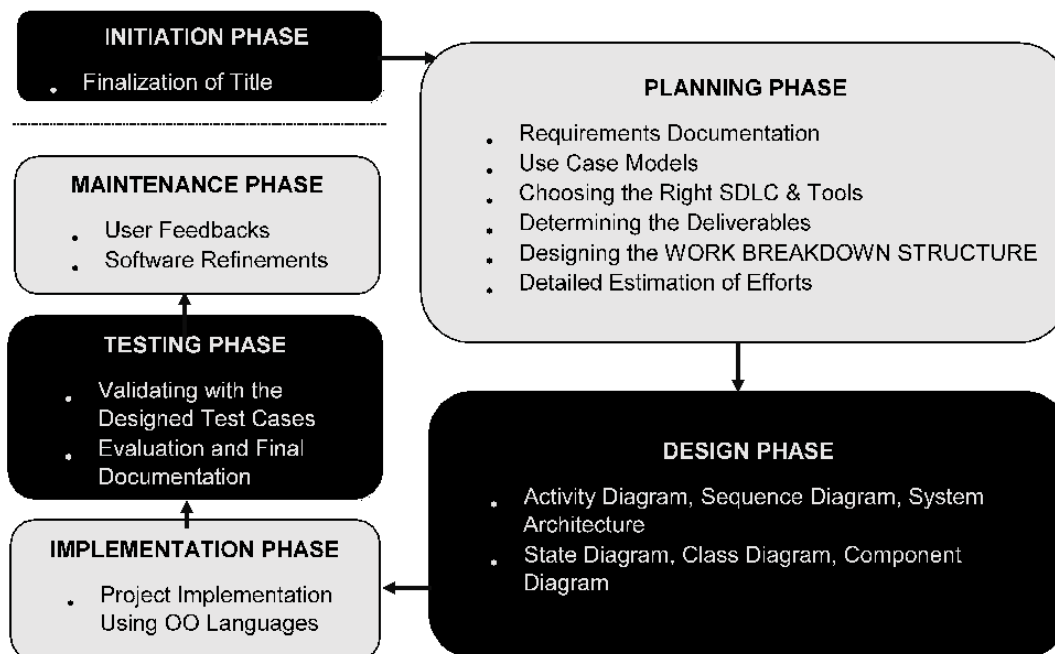
TASKS	KILO LINES OF CODE	EFFORT E in PERSON MONTHS
1. Authentication	0.9	2.2
2. Search for Book	0.9	2.2
3. Borrow Book	0.9	2.2
4. Reading the Book	0.9	2.2
5. Bookshelf	0.9	2.2
6. Book Details	0.9	2.2
		13.2 ~ 13

The sum of the calculation of Effort for all the individual tasks add up to **13.2 Person Months ~ 13 Person Months**.

2.6 CREATE THE GANTT CHART FOR SCHEDULING.

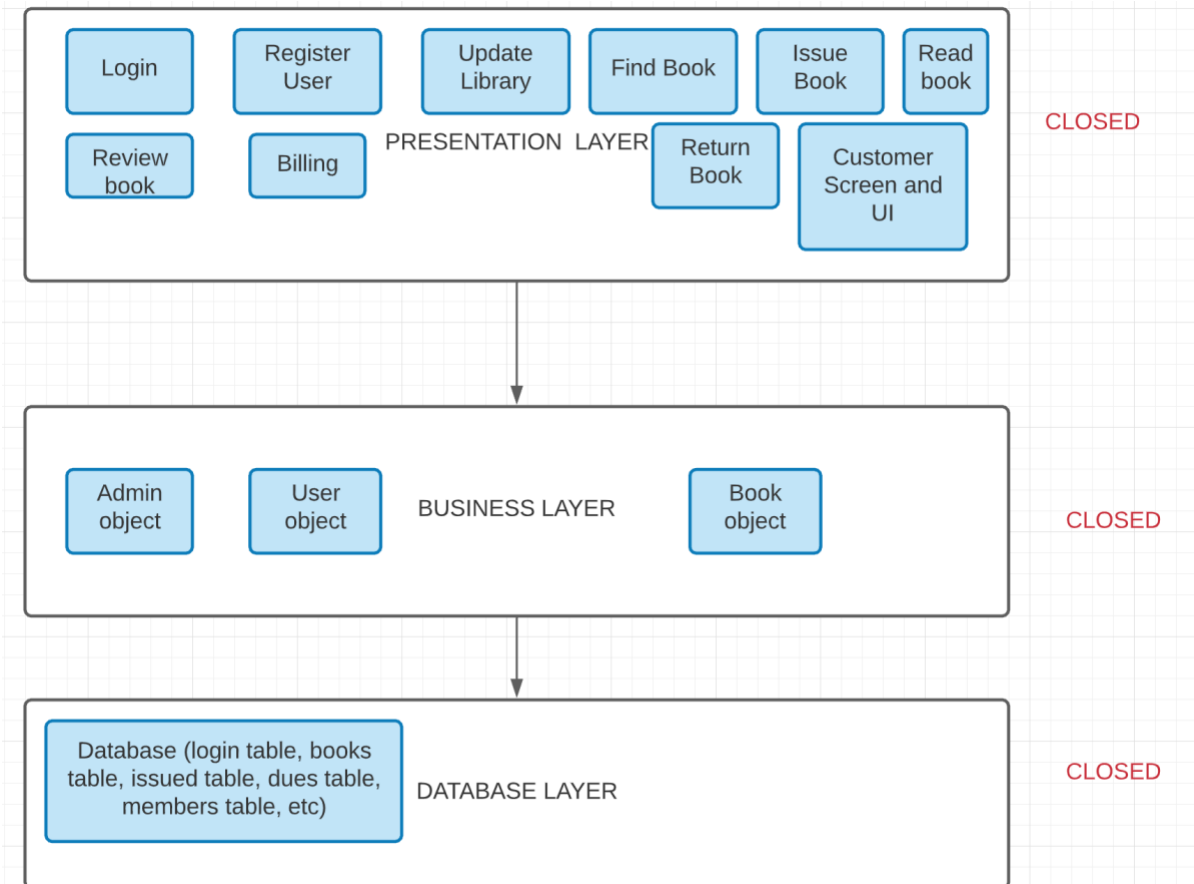
2.6.1 Timeline

TASKS	JAN	FEB	MAR	APR	MAY
INITIATION PHASE					
PLANNING PHASE					
DESIGN PHASE					
IMPLEMENTATION PHASE					
TESTING PHASE					
MAINTENANCE PHASE					



3 DESIGN DIAGRAMS

3.1 SOFTWARE ARCHITECTURE DIAGRAM- LAYERED



We identify distinct classes of services that can be arranged hierarchically in a series of horizontal layers. Each layer performs a specific role within the application.

ROLES OF EACH LAYER:

DATABASE LAYER:

Simple Databases expanding up to SANs (Storage Area Networks)

BUSINESS LAYER:

Business logic is the programming that manages communication between an end user interface and a database.

PRESENTATION LAYER:

Presentation of web pages, end user interacting APIs, and functions delivered.

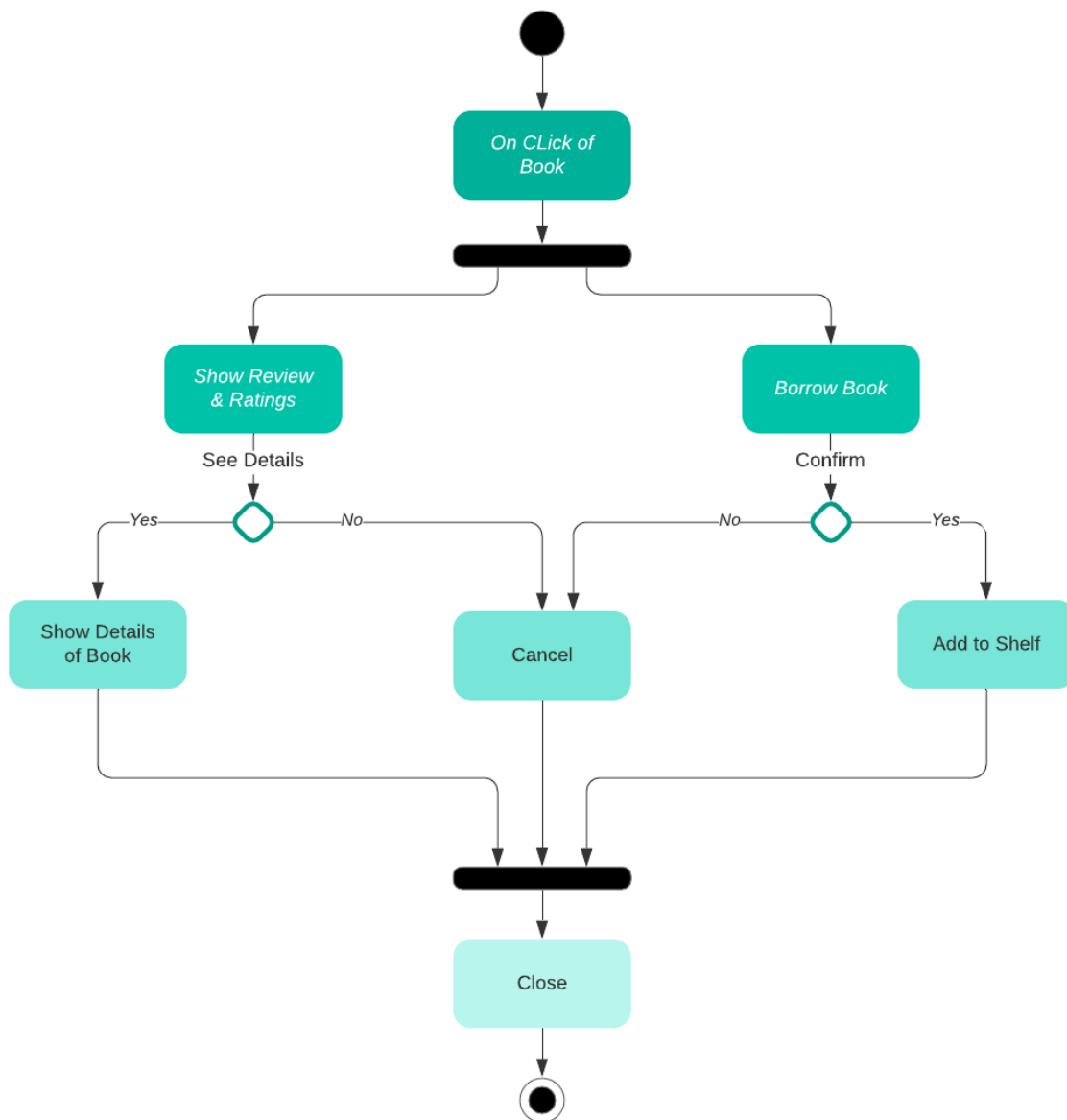
3.2 ACTIVITY DIAGRAMS

What's an activity diagram?

Activity diagram is a behavioral diagram in UML diagram to describe dynamic aspects of the system. Activity diagram is essentially an advanced version of flow chart that modeling the flow from one activity to another activity.

Activity Diagram for ClickBook functionality:

User may view reviews and ratings, details of book, or borrow book and add it to shelf on click of book.

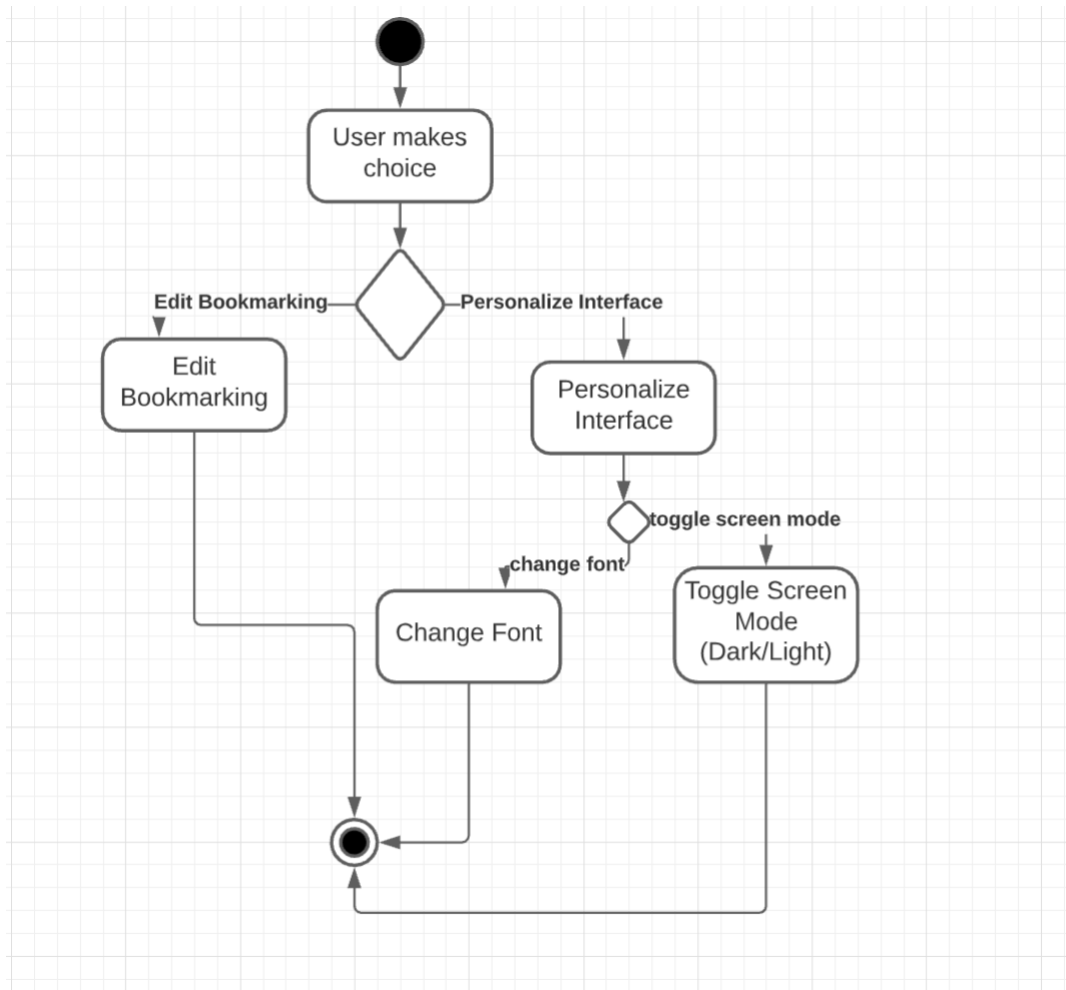


Design Diagrams for eBook Management System

Activity diagram for Personalization and Bookmarking:

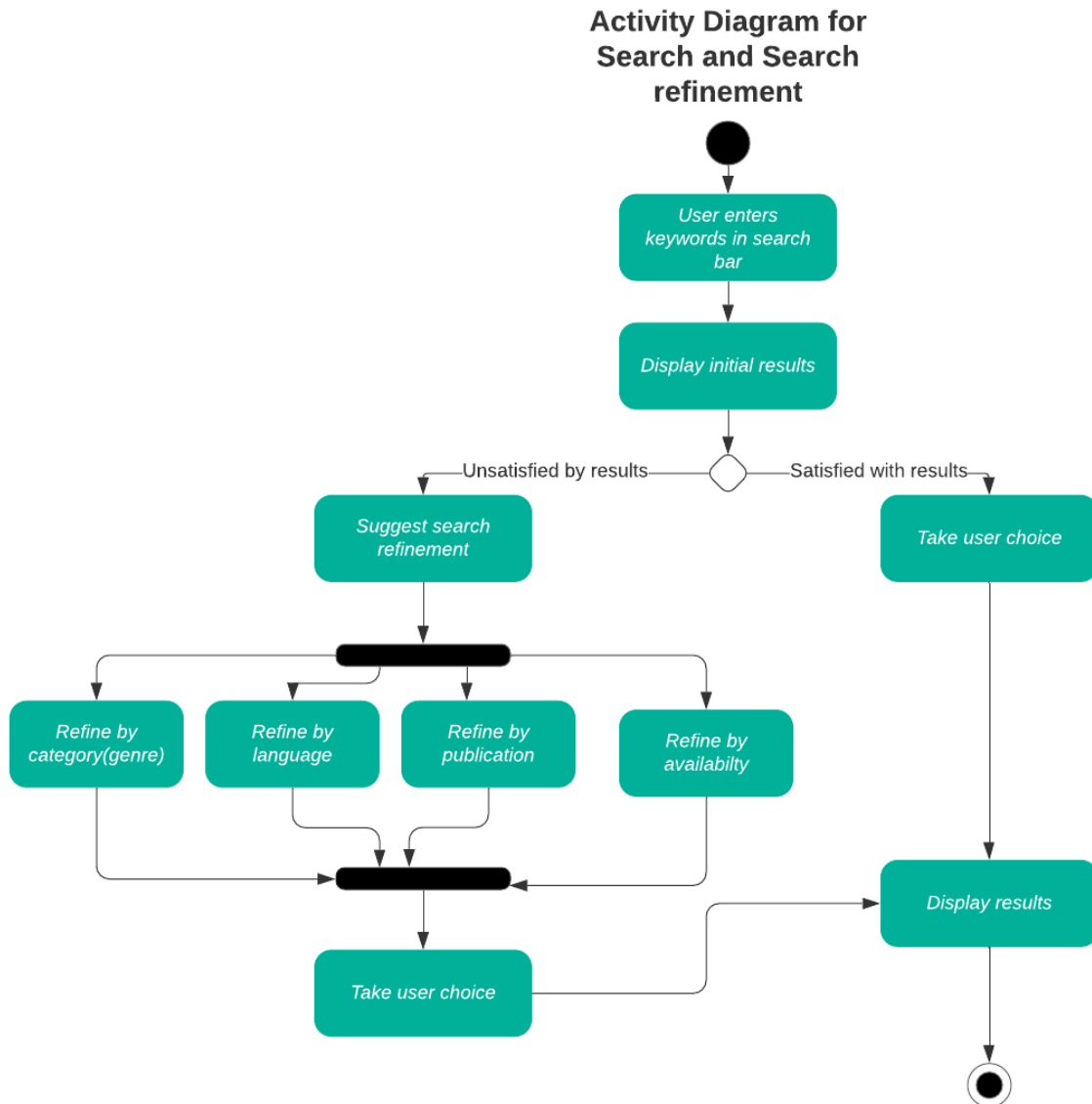
User may choose to edit bookmarking or personalize interface (change font or toggle screen mode).

NOTE: The Personalize Interface functionality falls beyond the scope of implementation of this project.



Activity Diagram for Search and Search Refinement:

User may search for book based on selected refinements.



3.3 CLASS DIAGRAMS

What is a class diagram?

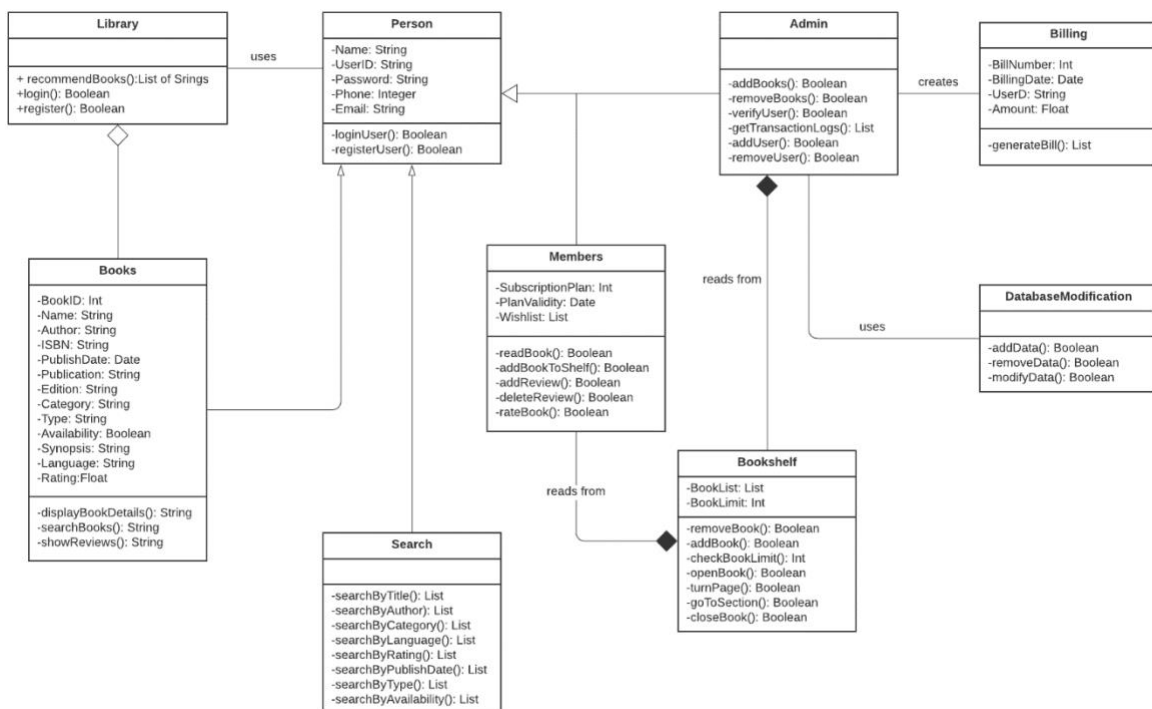
The UML Class diagram is a graphical notation used to construct and visualize object-oriented systems. A class diagram in the Unified Modeling Language (UML) is a type of static structure diagram that describes the structure of a system by showing the system's:

Design Diagrams for eBook Management System

- classes,
- their attributes,
- operations (or methods),
- relationships among objects.

Class Diagram for E-Book Management System:

Depicts the various classes that comprise the system and the relationships between them.



3.4 STATE DIAGRAMS

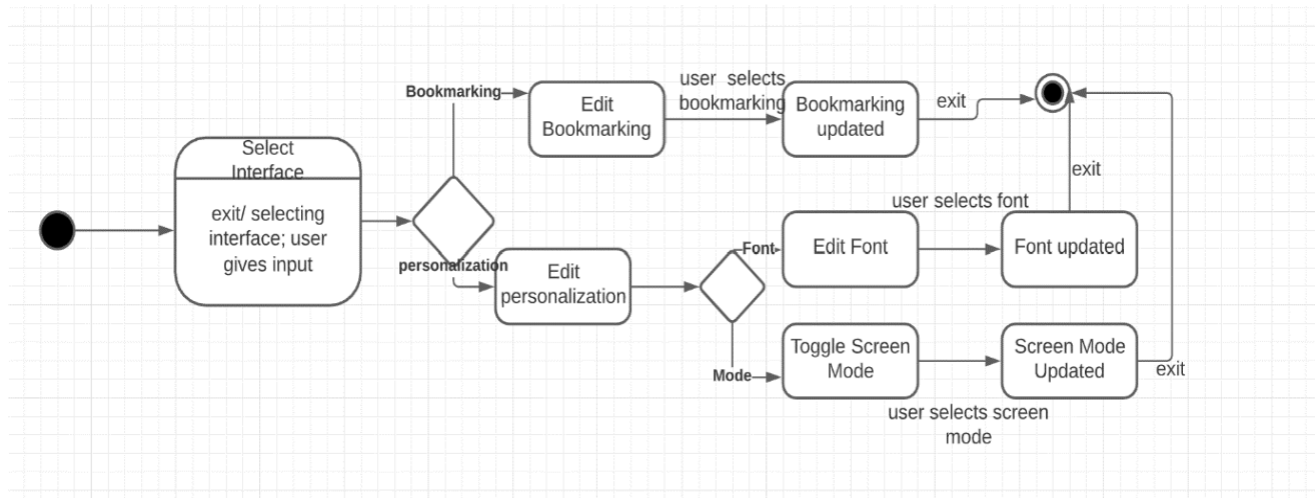
What is a state diagram?

A state diagram is used to represent the condition of the system or part of the system at finite instances of time. It's a behavioral diagram and it represents the behavior using finite state transitions.

State Diagram for Personalization and Bookmarking:

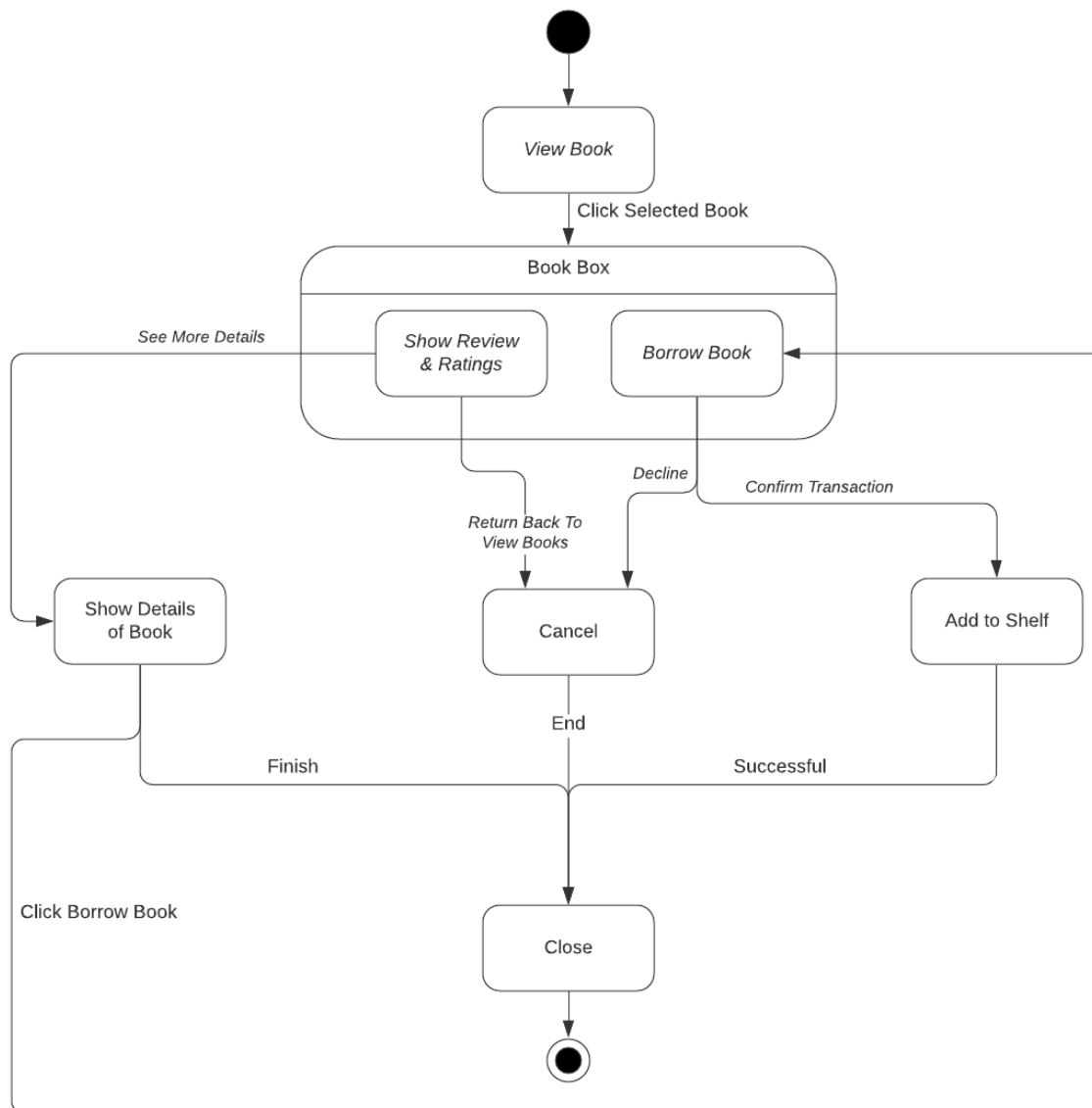
User may choose to edit bookmarking or personalize interfaces.

NOTE: The personalization functionality falls beyond the scope of implementation of this project.



State Diagram for ClickBook functionality:

User may view reviews and ratings, details of book, or borrow book and add it to shelf on click of book.



3.5 SEQUENCE DIAGRAMS

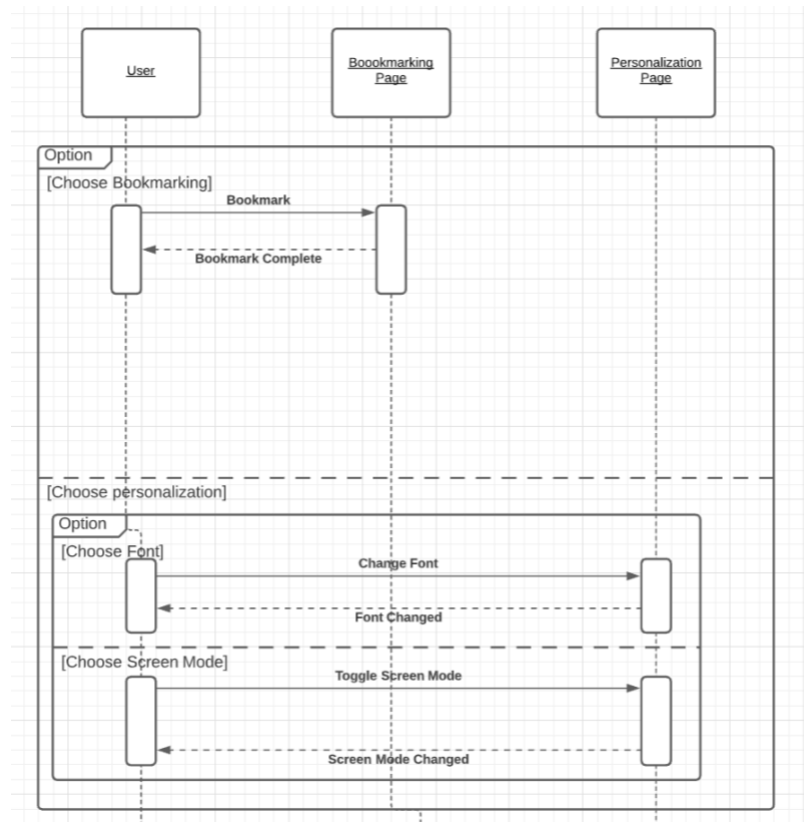
What is a sequence diagram?

A sequence diagram simply depicts interaction between objects in a sequential order i.e., the order in which these interactions take place.

Sequence Diagram for Personalization and Bookmarking:

User may choose to edit bookmarking or personalize interfaces.

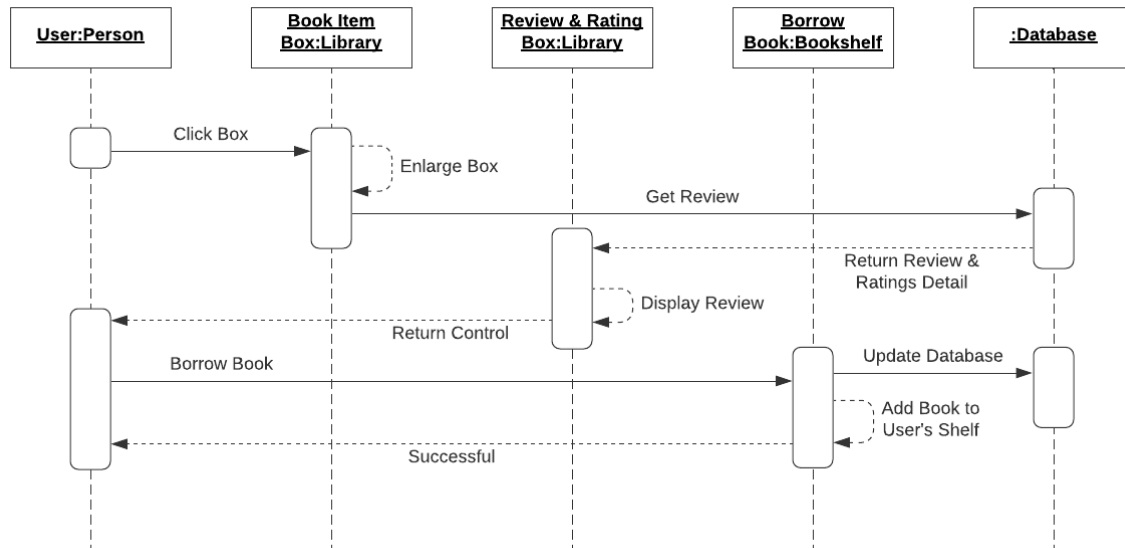
NOTE: The personalization functionality falls beyond the scope of implementation of this project.



Design Diagrams for eBook Management System

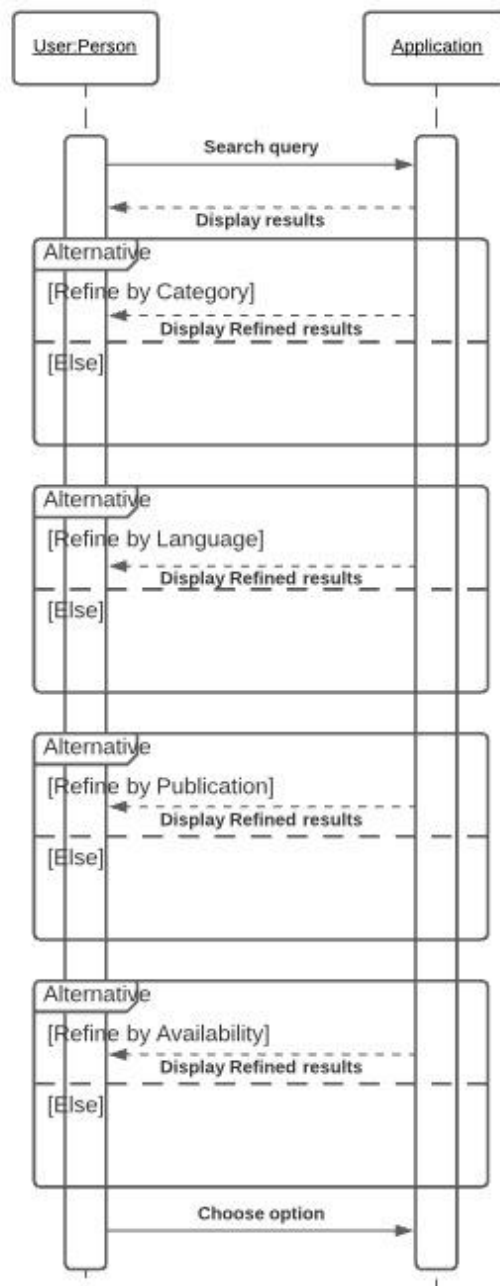
Sequence Diagram for ClickBook functionality:

User may view reviews and ratings, details of book, or borrow book and add it to shelf on click of book.



Sequence Diagram for Search and Search Refinement:

User may search for book based on selected refinements.



3.6 COMPONENT DIAGRAMS

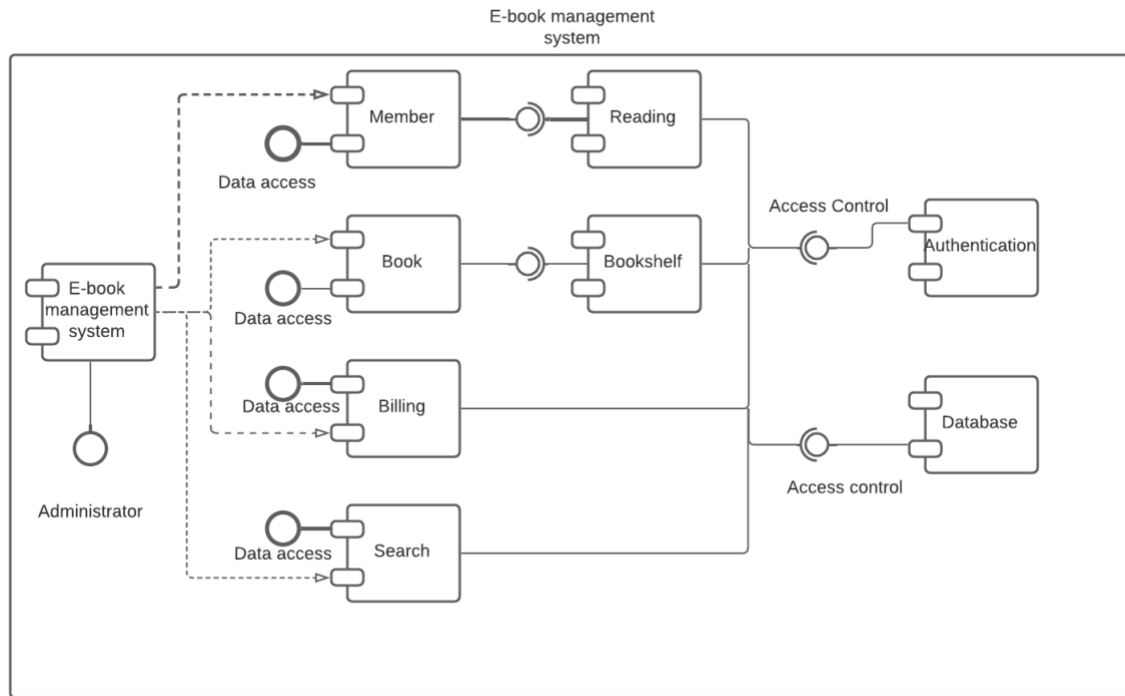
What's a component diagram?

Design Diagrams for eBook Management System

In Unified Modeling Language (UML), a component diagram depicts how components are wired together to form larger components or software systems.

Component Diagram of E-Book Management System:

Shows the different components that build the system and how they are wired together to form the system as a whole.



4 MODULES

Module Name	Description
LoginRegister	This is a module that contains all the login and registration functionalities of the eBook Management System. It includes various use cases like authentication, registering a new user, and login to the user account.
Add Book (Admin)	An admin has the privileges to add new books to the database, which will be available to all the other users to borrow and read.
Remove Book (Admin)	An admin has the privilege of removing books from the library, but deleting it from the database. This removes the book from library and makes it unavailable to anyone trying to borrow this book from the library, if not already in possession.
Borrow Book	A user can request to borrow a book from the library. If the book is available, the users can add it to their own bookshelf and have a copy of that book.
Return Book	A user can return the book they possess, to the library. The library performs the required transaction process for the user for returning the book.
Find Book	Find Book interface is common to both the users and the admin. They can search for books based on just title, or many other refinements to get a specific search result.
Read Book	A user who has borrowed a book, will have access to read the book from their bookshelf. The book will be opened in the user's choice of document viewer.
Review and Ratings	A user can leave a review and rating for each book they've read, either having it borrowed from the library or not. This helps other users to borrow the book based on their interest.
Maintenance	Admins can perform maintenance checks by directly going over the database or via GUI.

5 TEST CASES

Test Case ID	Module Name	Test Case Description	Pre-conditions	Test Steps	Test Data	Expected Result	Actual Result	Test Result (Pass/Fail)
UT_01	LoginRegister	Test the register functionality	Open app	Enter name, email, username, and password	Name = John Doe Username = johndoe1928 Password = password Email=jondoe@email.com	Registration successful.	Register and login to user / admin page	Pass
UT_02					Name = Jane Doe Username = janedoe Password = password Email=jondoe@email.com	User already exists.	Show Error that user exists	Pass
UT_03				Enter name, email, and username	Name = Jane Doe Username = janedoe Email=jondoe@email.com	Password Empty	Shows error for empty password field	Pass
UT_04				Enter name, email, username, and password	Name = John Doe Username = johndoe1920 Password = password	Password doesn't meet guidelines.	Shows error message that password is invalid	Pass
UT_05				Enter name, username, and password	Name = John Doe Username = johndoe1920 Password = password	Email Empty	Shows error message that Email can't be empty	Pass
UT_06				Enter email, username, and password	Email=jondoe@email.com Username = johndoe1920 Password = password	Name Empty	Shows error message that Name is Empty	Pass

Test Cases for eBook Management System

UT_07	LoginRegister	Test the register functionality	Open App	Enter name, and email	Name = John Doe Email=jondoe@email.com	Empty Fields	Shows error messages pertaining to empty fields	Pass
UT_08		Test login functionality		Enter name, email, username, and password	Name = John Doe Username = johndoe1920 Password = p	Password doesn't meet guidelines.	Shows error message that password is invalid	Pass
UT_09				Enter username, and password.	Username = janedoe Password = password	Login successful!	Redirects to user/admin's page	Pass
UT_10				Enter wrong password	Username = janedoe Password = fakepassword	Invalid Username or Password	Shows error message as invalid username or password	Pass
UT_11				Enter wrong username	Username = johndoes Password = password			
UT_12				Enter non-existent username	Username = johndoe7878 Password = password			
UT_13				Enter only username	Username = janedoe Password =	Fields Cannot be empty	Shows message to enter login credentials	Pass
UT_14				Enter only password	Username = Password = password			Pass
UT_15				Both Blank	Username= Password =			Pass
UT_16	Admin	Test add book functionality	Open app. Logged in as valid administrator	Go to Add Books Enter book ID,	Bookid = 1029282 Title= Software Engineering	Book added successfully	Book reflects in the database, shows message	Pass

Test Cases for eBook Management System

				title, author name, and category	Explained Author = John Doe Category = Education			
UT_17	Admin	Test add book functionality	Open app. Logged in as valid administrator.	Go to Add Books. Enter book ID, title, author, category	Bookid = 1029282 Title= Software Engineering Explained Author = John Doe Category = Education	Book already exists.	No updates to database, shows message book exists	Pass
UT_18				Go to Add Books. Enter book ID	Bookid =			Pass
UT_19				Go to Add Books. Enter category	Category = Education			Pass
UT_20				Go to Add Books. Enter book ID and title	Bookid = 1029282 Title= Software Engineering Explained			Pass
UT_21				Go to Add Books. Enter book ID author, and category	Bookid = 1029282 Author = John Doe Category = Education			Pass
UT_22				Go to Add Books. Enter book ID, title, author	Bookid = 1029282 Title= Software Engineering Explained Author = John Doe			Pass
UT_23				Go to Add Books. Blank				Pass
UT_24				Go to Add Books. Enter book ID(different), and rest same	Bookid = 1029284 Title= Software Engineering Explained Author = John Doe Category = Education	Book added successfully	Book reflects in the database, show message	Pass

Test Cases for eBook Management System

UT_25	Admin	Test find book functionality	Open app. Logged in as valid administrator.	Go to Search Enter bookID / availability	BookID=10238202	Book found.	Displays Book details	Pass
UT_26				Go to Search. Enter bookID / availability	BookID=102382022	Book Doesn't Exists	Shows message book doesn't exist	Pass
UT_27				Go to Search. Enter title / availability	Title=Cooking With Me	Display list of all relevant titles	Displays list of books with matching titles	Pass
UT_28				Go to Search. Enter category / availability	Category = fiction	Display list of books with matching fiction	Displays list of books with matching fiction	Pass
UT_29				Go to Search. Enter Language / availability	Language = Greek	Display list of books with matching language	Displays list of books with matching language	Pass
UT_30				Go to Search. Enter Availability	Availability = available	Display list of all available books	Displays list of all available books	Pass
UT_31				Go to Search. Enter Publication / Availability	Publication = McGraw Hill	Display list of all books of that publication	Displays list of books of that publication	Pass
UT_32		Test remove book functionality		Go to Remove Books Enter book id to remove.	Book id=1929329	Book removed.	Removes book from database	Pass

Test Cases for eBook Management System

UT_33	Admin	Test remove book functionality	Open app. Logged in as valid administrator.	Go to Remove Books Enter book id to remove.	Book id=19dfc34	Book not found.	Displays error message	Pass
UT_34				Go to Remove Books Enter book name, book id to remove.	Bookid = 1029284 Title= Software Engineering Explained	Book removed	Displays message book removed	Pass
UT_35				Go to Remove Books Enter book name to remove	Title= Software Engineering Explained	Enter Book ID	Displays message to enter book id	Pass
UT_36	User	Test add book functionality	Open app. Logged in as a valid user.	Go to Browse books. Search for relevant book	Bookid = 1029282 Title= Software Engineering Explained Author = John Doe Category = Education	Book to be added to user's shelf	Book is added to the user's shelf	Pass
UT_37					Bookid = 1029282 Title= Software Engineering Explained Author = John Doe Category = Education	Book Present in user's shelf	Shows that book is already present	Pass
UT_38		Test search book functionality		Go to Search. Enter bookID / availability.	BookID=10238202	Book found.	Display book/s to user	Pass
UT_39					BookID=102382020	Show it is Invalid book.	Displays message for invalid book	Pass
UT_40					Go to Search. Enter Title / availability	Title = Cooking with Me	Display list of all relevant titles	Displays the list of books of the same title

Test Cases for eBook Management System

UT_41	User	Test search book functionality		Go to Search. Enter Category / availability	Category = fiction	Display list of books of relevant Category	Displays list of books of the same category	Pass
UT_42				Go to Search. Enter Language / availability	Language = Greek	Display list of books of relevant language	Displays books of that language	Pass
UT_43				Go to Search. Enter availability	Availability = available	Display list of all available books	Displays all books available	Pass
UT_44				Go to Search. Enter Publication / availability	Publication = McGraw Hill	Display list of books of relevant publication	Displays all the books from that publisher	Pass
UT_45				Go to Search. Enter Author / availability	Author = Jondoe	Display list of books of relevant author	Displays all the books from that author	Pass
UT_46		Test remove book functionality		Go to Bookshelf Click on book Click on remove book	Book id=1929329	Book to be remove from user's shelf	Book removed from user's shelf	Pass
UT_47				Go to Bookshelf Click on book Click on remove book	Book id=19dfc34	Book not present in user's shelf	Book not in user's shelf not shown	Pass

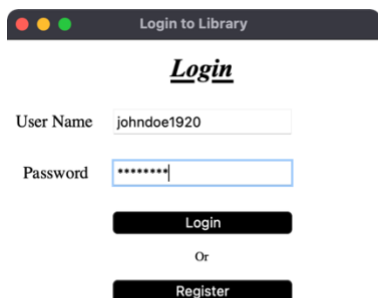
Test Cases for eBook Management System

UT_48	User	Test the add reviews and ratings.	Open app; logged in as valid user.	Click on Book, Add Review Enter review and rating	Bookid=19832029 Review="excellent read!" Rating=5	Display other reviews and add the new review and rating.	Displays all the old review, and adds the new review and rating	Pass
UT_49					Bookid=19832026 Review="excellent read!" Rating=5	Unavailable book should not be shown	Unavailable book not displayed, no review section	Pass
UT_50				Click on Book, Add Review Enter rating	Bookid=19832029 Rating=5	Display other reviews and add the new rating.	Displays all the old review, and adds the new review and rating	Pass
UT_51				Click on Book, Add Review Enter review	Bookid=19832029 Review="excellent read!"	Display other reviews and add the new review and rating.	Displays all the old review, and adds the new review and rating	Pass
UT_52				Click on Book, Add Review Blank Entry		Show Error, no blanks allowed	Displays error message that blank reviews cannot be submitted	Pass
UT_53		Test the read book functionality		Click book on bookshelf	Bookid=198320	Book should open to read	Book displayed to be read	Pass
UT_54					Bookid=1980102929	Book not in user's shelf should not be shown	Book isn't shown	Pass

Test Cases for eBook Management System

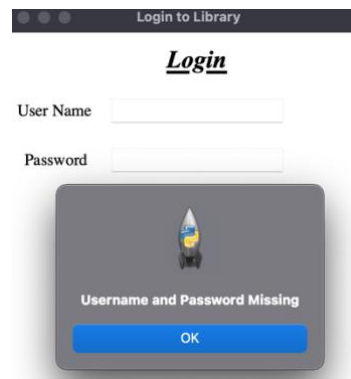
UT_55	User	Test the edit bookmarking functionality	Open app; logged in as valid user.	Click book on bookshelf Click on Edit Bookmarking	Bookid=19802392 Page=5	Bookmarking edited successfully.	Bookmark modified	Pass
UT_56				Enter bookID Click on Edit Bookmarking	Bookid=198293829 Page=6	Book not in user's shelf should not be displayed	Book unavailable in user's shelf	Pass
UT_57		Test the show reviews and ratings, and display book details functionality		Go to Search Book/Bookshelf (Enter Book id) Click on Book	Bookid=19832029	Display all previous ratings and reviews, and also displays book details.	Displays book info and all reviews and ratings	Pass
UT_58					Bookid=19119822	Book not found (On entering ID)	Displays book not found message (On entering ID)	Pass
UT_59		Test add book functionality		Go to Search Book Enter Search details Click on Book Click on add book	Bookid=19803902	Book successfully added to shelf	Adds book to user's shelf	Pass
UT_60				Go to Search Book Enter Search details Click on Book Click on add book	Bookid=1980390123	Book not found	Displays message book not found	Pass

6 OUTPUT SCREENSHOTS



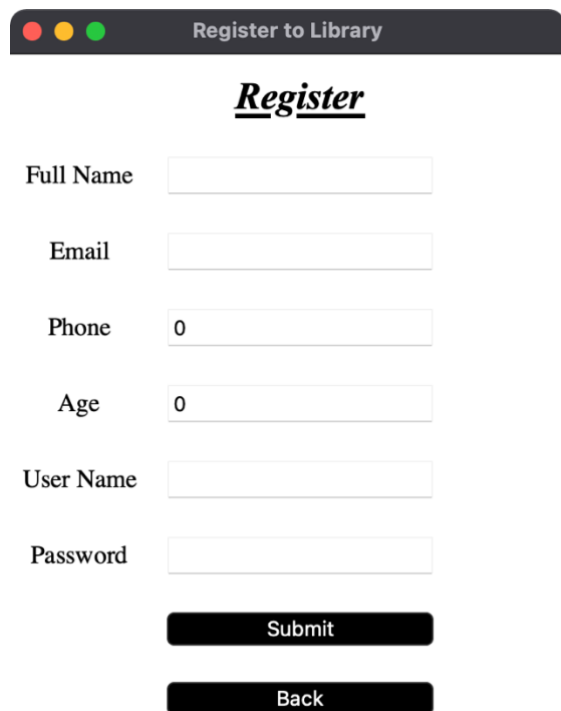
A screenshot of the 'Login to Library' window. The title bar says 'Login to Library'. Below the title bar, the word 'Login' is centered and underlined. There are two input fields: 'User Name' with the text 'johndoe1920' and 'Password' with masked characters '*****'. Below the password field is a 'Login' button. Below the 'Login' button is the text 'Or'. Below 'Or' is a 'Register' button.

Login Page



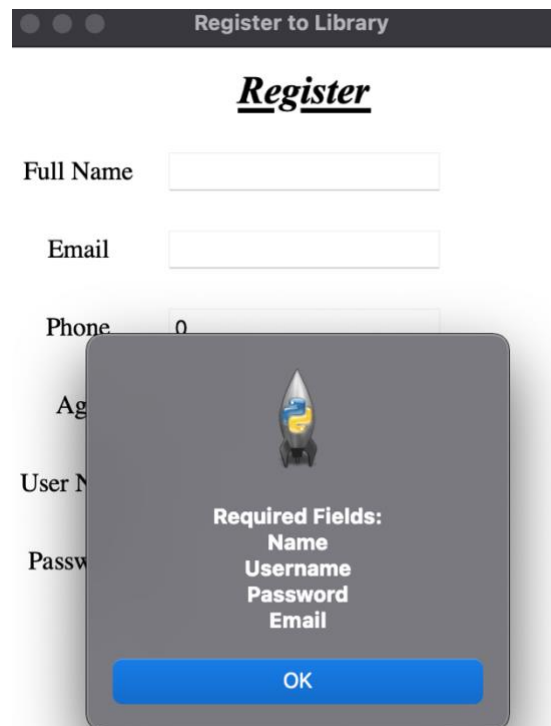
A screenshot of the 'Login to Library' window showing an error. The title bar says 'Login to Library'. Below the title bar, the word 'Login' is centered and underlined. There are two empty input fields for 'User Name' and 'Password'. Below the password field is a modal dialog box. The dialog box has a rocket icon and the text 'Username and Password Missing'. At the bottom of the dialog box is an 'OK' button.

Login Page – Error



A screenshot of the 'Register to Library' window. The title bar says 'Register to Library'. Below the title bar, the word 'Register' is centered and underlined. There are six input fields: 'Full Name', 'Email', 'Phone' (with '0' in the field), 'Age' (with '0' in the field), 'User Name', and 'Password'. Below the password field are two buttons: 'Submit' and 'Back'.

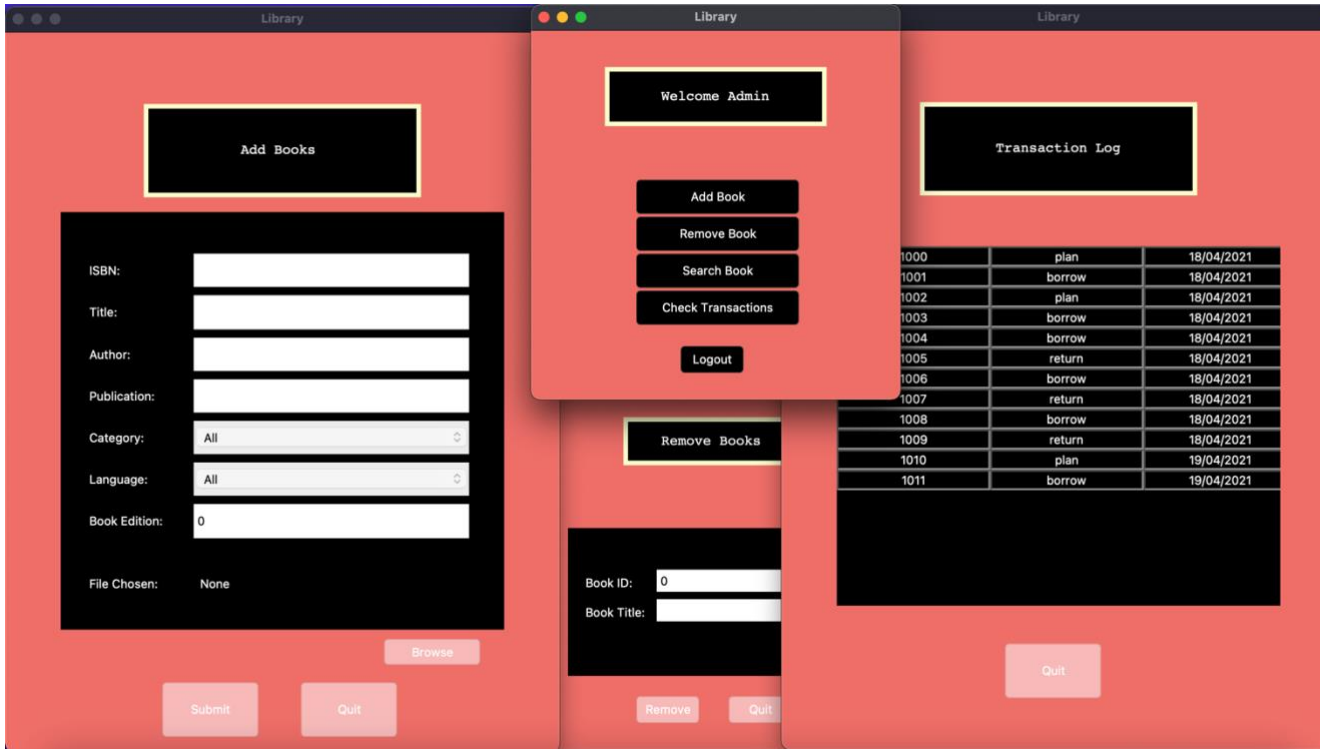
Registration Page



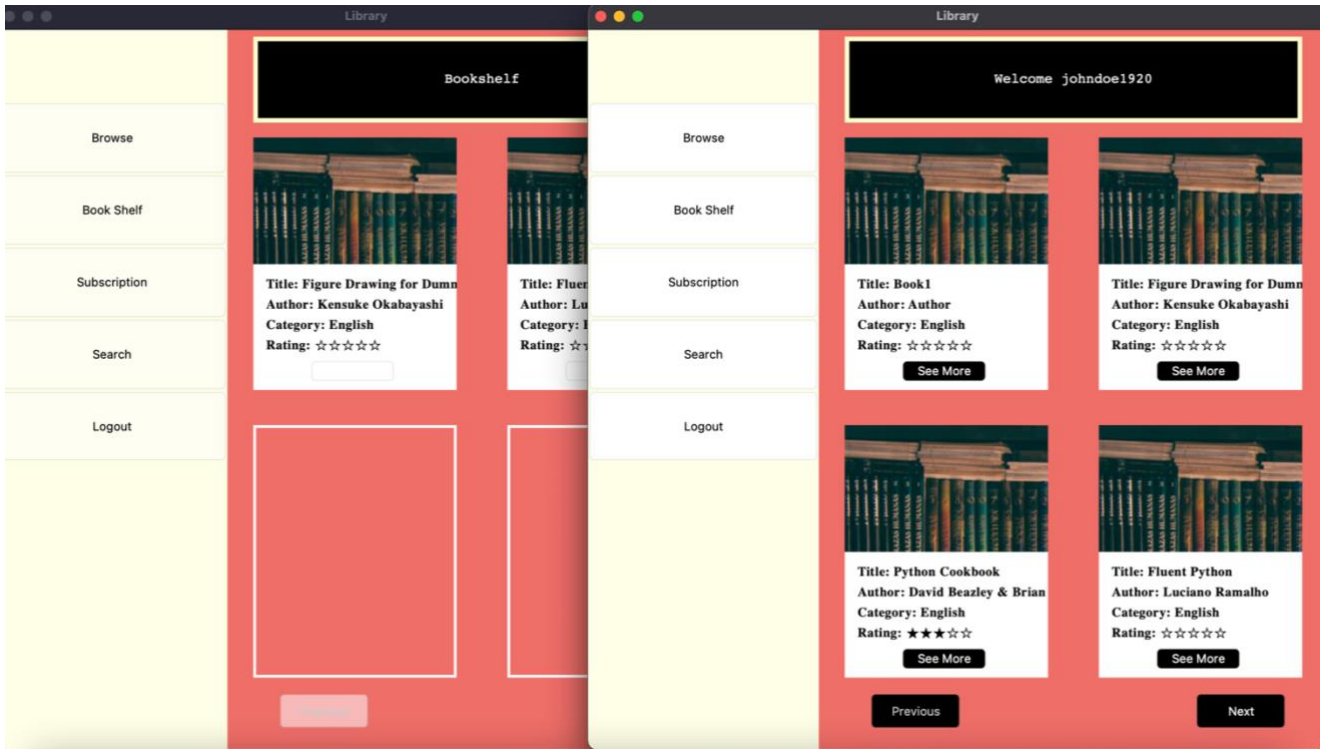
A screenshot of the 'Register to Library' window showing an error. The title bar says 'Register to Library'. Below the title bar, the word 'Register' is centered and underlined. There are six empty input fields for 'Full Name', 'Email', 'Phone', 'Age', 'User Name', and 'Password'. Below the password field is a modal dialog box. The dialog box has a rocket icon and the text 'Required Fields: Name Username Password Email'. At the bottom of the dialog box is an 'OK' button.

Registration Page – Error

Output Screenshots for eBook Management System

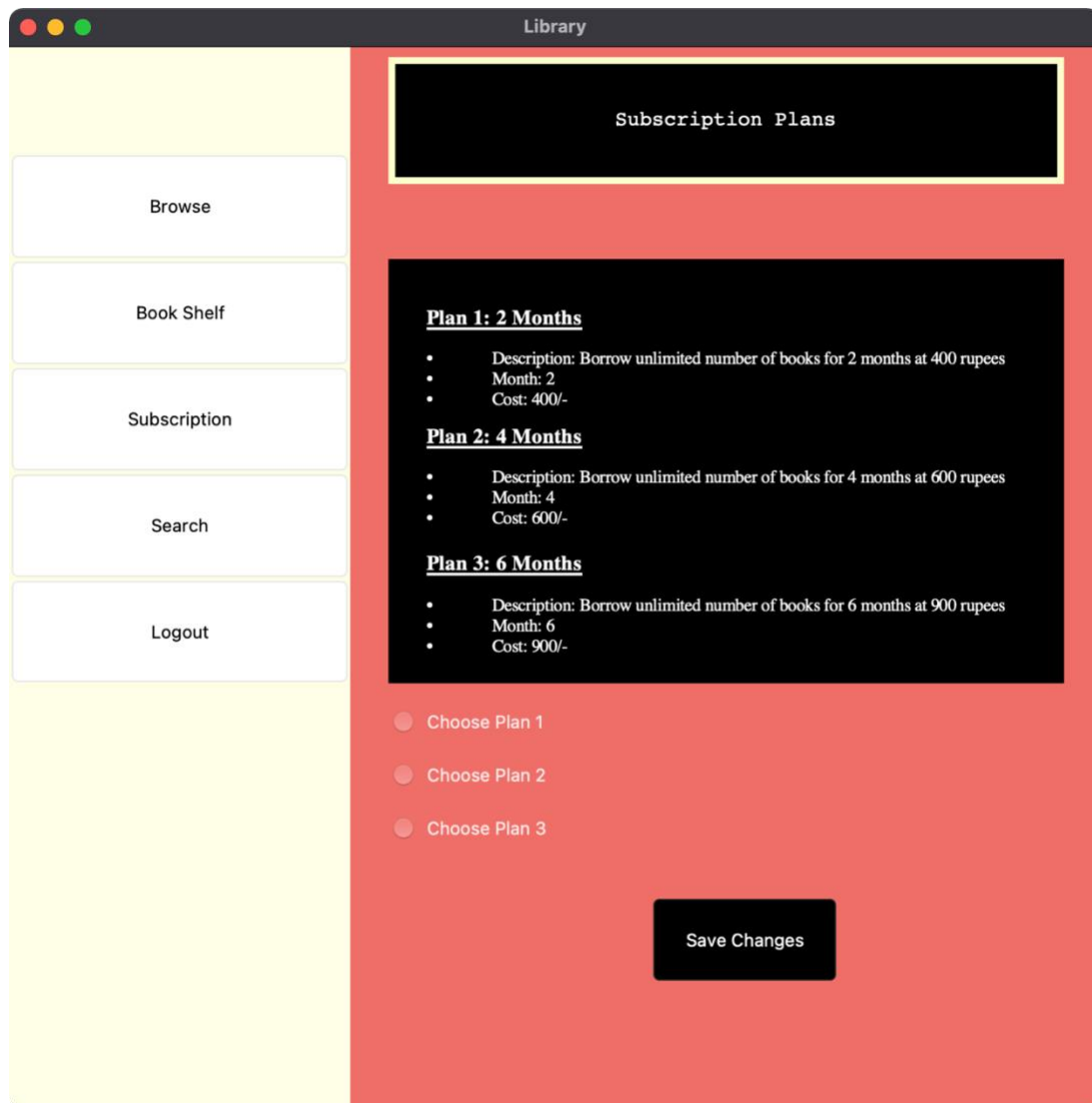


Admin – GUI (Main Page, Add Books, Remove Books, Transaction Logs)



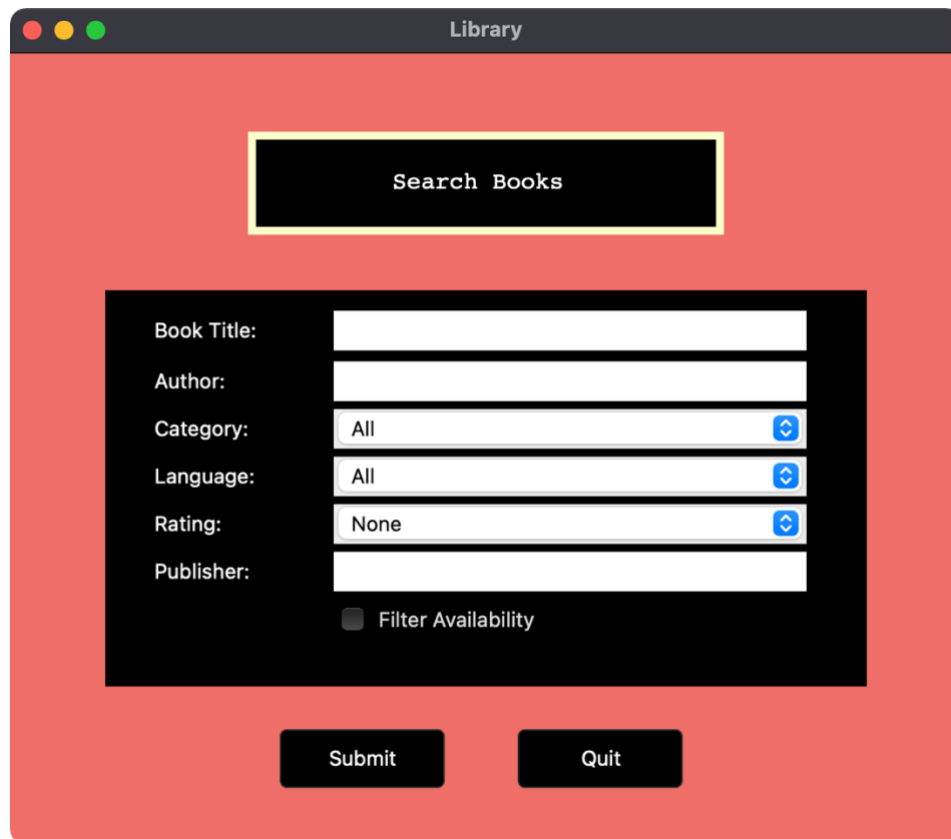
User – GUI (Browse, Bookshelf)

Output Screenshots for eBook Management System



User – GUI (Subscription Page)

Output Screenshots for eBook Management System



The screenshot shows a window titled "Library" with a red background. At the top center is a black button labeled "Search Books". Below it is a black rectangular area containing search filters. These filters include text input fields for "Book Title:", "Author:", and "Publisher:". There are also dropdown menus for "Category:" (set to "All"), "Language:" (set to "All"), and "Rating:" (set to "None"). At the bottom of this filter area is a checkbox labeled "Filter Availability" which is currently unchecked. Below the filter area are two black buttons: "Submit" and "Quit".

Admin/User – GUI (Search)