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Book Prism

In partial fulfilment of the requirements for the degree of

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Supervisor: Dr. Zia Ul Rehman

Department of Computer Sciences

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C e r t i f i c a t e

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"Book Prism"

Written by

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as a confirmation to the required standard for the partial fulfilment of the degree of Bachelor of Science in Information Technology.

Approved by:

Supervisor: Dr. Zia Ul Rehman

_____ (Signature)

June 14, 2022

DECLARATION

We hereby declare that this project report is based on our original work except for citations and quotations which have been duly acknowledged. We also declare that it has not been previously and concurrently submitted for any other degree or award at Bahria University or other institutions.

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Date : June 14, 2022

Specially dedicated to
my beloved grandfather, mother and father
(Zain Afzal)
my beloved grandmother, mother and father
(Ahmed Ali)

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ZAIN AFZAL
AHMED ALI

BOOK PRISM

ABSTRACT

It has been a long-held desire of many to create robots that can perform human tasks such as reading. Machine learning, on the other hand, has progressed from being a pipe dream to being a reality during the previous five decades. Now, there are a variety of approaches and algorithms that may be used to teach a computer to execute tasks similar to those performed by people. The ability to listen is the first linguistic skill that humans learn. Listening to audio books may make learning much more enjoyable while also making it easier. In last of the few years, there is decreasing rate of book reading among children and it is mostly due to rapidly expanding technology. Children of different age group are enjoying games; love viewing videos but not reading the book. Now days, books are replaced by mobiles phones, laptop and tablets. These items have not only replaced books but also influences their talents like creative thinking, imagination, emotional intelligence and logical reasoning. Our web application will have three modules: image processing, voice processing, and text-to-speech synchronization. It turns images to text, whereas voice processing converts text to sound. We will synchronize text and speech in the final module.

TABLE OF CONTENTS

DECLARATION **ii**
ACKNOWLEDGEMENTS **iv**
ABSTRACT **v**
TABLE OF CONTENTS **vi**
LIST OF TABLES **ix**
LIST OF FIGURES **xi**
LIST OF SYMBOLS / ABBREVIATIONS **xiv**

CHAPTER 1 **1**

1 INTRODUCTION **1**
1.1 Background 1
1.2 Problem Statements 1
1.3 Final Deliverable of the Project and Beneficiaries 1
1.4 Aims and Objectives 2
1.5 Scope of Project 2
CHAPTER 2 **3**

2 LITERATURE REVIEW (and/or SRS) **3**
2.1 Overview 3
2.2 Overall Description 3
2.3 Product Function: 4

2.3.1 Administration **4**
2.4 User Characteristics: 13
2.5 Constraints 13

	2.6	Assumptions and Dependencies	14
	2.7	Specific requirement:	14
CHAPTER 3			**17**
3	**DESIGN AND METHODOLOGY**		**17**
	3.1	Use Cases	17
	3.2	Architecture Diagram	42
	3.3	Entity Relationship Diagram	42
	3.4	Data Flow Diagram	44
	3.5	Class Diagram	45
	3.6	Activity Diagram	46
	3.7	Sequence Diagram	53
	3.8	Collaboration Diagram	65
	3.9	State Transition Diagram	77
	3.10	Component Diagram	79
	3.11	Deployment Diagram	79
CHAPTER 4			**80**
4	**DATA AND EXPERIMENTS (and/or IMPLEMENTATION)**		**80**
	4.1	Languages used for Implementation:	80
	4.2	Framework:	80
	4.3	Tools:	81
CHAPTER 5			**82**
5	**RESULTS AND DISCUSSIONS (or USER MANUAL)**		**82**
	5.1	Sign-up page	82
	5.2	Sign-in Page	83
	5.3	Home Page	83
	5.4	Books Page:	84
	5.5	Upload Book Page	84
	5.6	Account Information Page	85
	5.7	Modules Implementation	85
	5.8	Book Rating	86

CHAPTER 6 **87**

6 CONCLUSION AND RECOMMENDATIONS **87**

REFERENCES **88**

LIST OF TABLES

Table 2.1 Log in to the account 5

Table 2.2 Log out of the account 5

Table 2.3 Deactivate the account 5

Table 2.4 Admin to remove the user 6

Table 2.5 Change the password 6

Table 2.6 Admin to view user's statistics 6

Table 2.7 Sign up in the account 7

Table 2.8 Log in to the account 8

Table 2.9 Log out of the account 8

Table 2.10 Upload the book 8

Table 2.11 Listen the contents of the book 8

Table 2.12 Delete the book 9

Table 2.13 Download the book 9

Table 2,14 Remove the garbage text 9

Table 2.15 Search the book 10

Table 2.16 Pause audio 10

Table 2.17 Restart audio 11

Table 2.18 Rate the book 11

Table 2.19 Deactivate the account. 11

Table 2.20 Change the password 12

Table 2.21 Users to view their information 12

Table 2.22 Users to make the book public. 12

Table 2.23 Users to make the book private. 13

Table 2.24 Text is highlighted 13

LIST OF FIGURES

Figure 3.2: Architecture Diagram 42

Figure 3.3: Entity Relationship Diagram 42

Figure 3.3: Logical Schema against ERD 44

Figure 3.4.1: Data Flow Diagram Level 0 44

Figure 3.4.2: Data Flow Diagram Level 1 45

Figure 3.5: Class Diagram 45

Figure 3.6.1.1: Activity Diagram # 1, Admin Login 46

Figure 3.6.1.2: Activity Diagram # 2, Admin Logout 46

Figure 3.6.1.3: Activity Diagram # 3, Admin Deactivate Account 46

Figure 3.6.1.4: Activity Diagram # 4, Admin Remove User 47

Figure 3.6.1.5: Activity Diagram # 5, Admin Change Password 47

Figure 3.6.1.6: Activity Diagram # 6, Admin View User's Stat 47

Figure 3.6.2.1: Activity Diagram # 7, User Sign Up 47

Figure 3.6.2.2: Activity Diagram # 8, User Login 48

Figure 16.6.2.3: Activity Diagram # 9, User Logout 48

Figure 3.6.2.4: Activity Diagram # 10, User Upload Book 48

Figure 3.6.2.5: Activity Diagram # 11, User Listen Book 48

Figure 3.6.2.6: Activity Diagram # 12, User Delete Book 49

Figure 3.6.2.7: Activity Diagram # 13, User Download Book 49

Figure 3.6.2.8: Activity Diagram # 14, Remove Garbage Text 49

Figure 3.6.2.9: Activity Diagram # 15, User Search Book 49

Figure 3.6.2.10: Activity Diagram # 16, User Pause Audio 50

Figure 3.6.2.11: Activity Diagram # 17, User Restart Audio 50

Figure 3.6.2.12: Activity Diagram # 18, User Rate Book 50

Figure 3.6.2.13: Activity Diagram # 19, User Deactivate Account 50

Figure 3.6.2.14: Activity Diagram # 20, User Change Password 51

Figure 3.6.2.15: Activity Diagram # 21, User View Account Info 51

Figure 3.6.2.16: Activity Diagram # 22, Highlight Text 51

Figure 3.6.2.17: Activity Diagram # 23, User Make Book Public 51

Figure 3.6.2.18: Activity Diagram # 24, User Make Book Private 52

Figure 3.6.3: Aggregated Activity Diagram 52

Figure 3.7.1.1: Sequence Diagram # 1, Admin Login 53

Figure 3.7.1.2: Sequence Diagram # 2, Admin Logout 53

Figure 3.7.1.3: Sequence Diagram # 3, Admin Deactivate Accoun 54

Figure 3.7.1.4: Sequence Diagram # 4, Admin Remove User 54

Figure 3.7.1.5: Sequence Diagram # 5, Admin Change Password 55

Figure 3.7.1.6: Sequence Diagram # 6, Admin View User’s Stat 55

Figure 3.7.2.1: Sequence Diagram # 7, User Sign Up 56

Figure 3.7.2.2: Sequence Diagram # 8, User Login 56

Figure 3.7.2.3: Sequence Diagram # 9, User Logout 57

Figure 3.7.2.4: Sequence Diagram # 10, User Upload Book 57

Figure 3.7.2.5: Sequence Diagram # 11, User Listen Book 58

Figure 3.7.3: Aggregated Sequence Diagram 64

Figure 3.8.2.1: Collaboration Diagram # 7, User Module 68

Figure 3.8.2.15: Collaboration Diagram # 21, User View Account 75

Figure 3.8.2.16: Collaboration Diagram # 22, Highlight Text 75

Figure 3.8.2.17: Collaboration Diagram # 23, User Make Book Public 76

Figure 3.8.2.18: Collaboration Diagram # 24, User Make Book Private 76

Figure 3.8.3: Aggregated Collaboration Diagram 77

Figure 3.9.1: Admin State Transition Diagram 77

Figure 3.9.2: User State Transition Diagram 78

Figure 3.10: Component Diagram 79

Figure 3.11: Deployment Diagram 79

LIST OF SYMBOLS / ABBREVIATIONS

ML	Machine Learning
SRS	Software requirements specification
AI	Artificial intelligence
OCR	Optical character recognition
ERD	Entity–relationship model
DBMS	Database Management Systems
AR	Architectural Diagram
IP	Image Processing
VP	Visual Processing
PY	Python
UML	Unified Modelling Language
HTML	Hypertext Markup Language
CSS	Cascading Style Sheets
SQL	Structured Query Language
JS	JavaScript

CHAPTER 1

INTRODUCTION

1.1 Background

It is an ancient dream to replicate machines to perform human functions, like reading. However, machine learning has grown from a dream to reality, over the last five decades. Now, there are several techniques and algorithms to train a machine in order to perform things like humans. Listening is the first language skill that we acquire. Listening to audio books can make learning much easier and entertaining.

1.2 Problem Statements

Our application intends to provide three modules, the image processing module, voice processing module and syncing of text and speech. Image processing module converts the image into text, whereas, voice processing module changes the text into sound. However, in the last module we will synchronize text and speech and highlight the text. Optical character recognition and speech synthesis are the two main components which will be used in these modules. Optical character recognition is the process of converting scanned images of machine printed or handwritten text, into a computer format text. Speech synthesis is the artificial synthesis of human speech.

1.3 Final Deliverable of the Project and Beneficiaries

Administration, students, and book enthusiastic at a university or college are the primary beneficiaries of this system.

1.4 Aims and Objectives

The main goals and objectives of our project are:

1. To do image processing to convert the given image into text.
2. To do text processing to analyze, normalize and transcribe the text into a phonetic or some other linguistic representation.
3. To generate speech from text produced by OCR.
4. To synchronize text and speech in order to highlight the text.
5. To highlight the text in order to make it visible to the user.

1.5 Scope of Project

This project will consist of creating a web application for listening audiobooks using speech synthesis and text highlighting [1]. The input data will be given either in the form of text or image. As stated earlier, there are five modules on which this application will work. The first is an image processing module which converts the image into text. The second is a voice processing module that generates speech from text. [2] The third module is to remove garbage text from the storybook which includes removal of page numbers and the title of the storybooks from the top of the top of the page. Moreover, in fourth module we will synchronize text and speech. [3] These modules could be done using machine learning (ML). [4] Once the speech is generated, we will do synchronization between text and speech and highlight the word at that time.

CHAPTER 2

LITERATURE REVIEW (and/or SRS)

2.1 Overview

The remaining SRS document will cover all user requirements it will provide detailed description with diagrams of each module individually. Specifications of entire project will be explained. This section will describe product perspective, functions (user interface, hardware interface, software interface, system interface, memory) each functionality explained in detail. Constraints of our projects will be discussed then document will cover functional and non-functional requirements of our project. [5] Each functionality will be defined with diagram and table to make the workflow clear and then it will focus on the designing of our project (architectural design, ERD) etc. [6]

2.2 Overall Description

- **Product perspective:**

The project has the two main feature that can be develop by the help of the machine learning libraries, the first feature is to upload the book of the own choice if our user is the young children than user must upload the cartoon comic book, if our user is mature and don't read the topic so it upload his content which he or she learn and the second feature is to listen the content and also text is highlighted when the voice is start we also download the video of the voice book. [7]

- **System interfaces:**

Our system, driver drowsiness detection, will interact services as it will show for the users.

- **User interface:**

The interface of the website is designed to be, interactive and easy to use. To attract maximum audience, the interface is kept simple and easy to use. Anyone who is familiar with basics can use it. Anyone can easily enter the input in the form of images and get their result. [8]

- **Hardware interface:**

The website can be used on any device such as a mobile phone, laptop computer or a tab as long as it has active internet connection. To use the services of the Detection of Drowsiness platform.

- **Software interface:**

Software interfaces include operating system for the computer, a browser to access the website with internet connectivity. A DBMS is also used to handle the database. Other software required for development include PyCharm, Flask, Jupiter notebook and Android Studio.[9]

- **Communication interface:**

Communication on the system requires working internet connection.

- **Memory:**

The system requires very little primary and secondary memory.

- **Operation:**

The system will perform many operations such as login, logout, detection check and view detection etc. Admin can manage the user account, view user remove account, view and remove detection etc. [10]

2.3 Product Function:

Product functions are divided into two categories depending upon the type of user.

Product Functions are as follows:

- User Functions
- Administration Functions

2.3.1 Administration:

- Log in to the account
- Log out of the account
- Deactivate the account
- Admin to remove the user
- Change the password
- Admin to view user's statistics

ID	**FR_1**			
Name	Admin Login			
Description	Input	Output	Requirements	Basic Work Flow
Enter login information	ID, Password	Login Successful	Registered Account	Enter Correct Information and press login button. System matches the login id and password to display

Table 2.1 Log in to the account

ID	**FR_2**			
Name	Admin Logout			
Description	Input	Output	Requirements	Basic Work Flow
Logout the system	Click on logout button	The System will logout	Admin must login first	Clicking the logout button will bring back

Table 2.2 Log out of the account

ID	**FR_3**			
Name	Deactivate the account			
Description	Input	Output	Requirements	Basic Work Flow
Deactivate the account from the system	User ID	Deactivate the user account	The one user must include in the system	Search the User by its id and remove it from

Table 2.3 Deactivate the account

ID	**FR_4**			
Name	Remove the User			
Description	Input	Output	Requirements	Basic Work Flow
Delete a User from Academy	User ID	User deleted Successfully.	At least one User must be in enrolled first	Search the User by its id and remove it from

Table 2.4 Admin to remove the user

ID	**FR_5**			
Name	Admin change the password			
Description	Input	Output	Requirements	Basic Work Flow
Admin change the password	Enter the Admin ID	All Profile information is displayed	At least you already make the account in the system	Than renter the password of the account.

Table 2.5 Change the password

ID	**FR_6**			
Name	Admin to view user's statistics			
Description	Input	Output	Requirements	Basic Work Flow
view a User from the system	User ID	User profile displayed	At least one candidate must be in Recruits list	Search the candidate by its id show its Profile.

Table 2.6 Admin to view user's statistics

2.3.2 User:

1. Sign up in the account
2. Log in to the account
3. Log out of the account
4. Upload the book

5. Listen the contents of the book
6. Delete the book
7. Download the book
8. Remove the garbage text
9. Search the book
10. Pause audio
11. Restart audio
12. Rate the book
13. Deactivate the account.
14. Change the password
15. Users to view their information
16. Users to make the book public.
17. Users to make the book private.
18. Text is highlighted

ID	**FR_7**			
Name	User Sign Up			
Description	Input	Output	Requirements	Basic Work Flow
Sign Up the system	Click on Sign Up button	The System will Show Sign up Fields.	Must fill all Fields	Clicking the Sign-up button will bring to main system.

Table 2.7 Sign up in the account

ID	**FR_8**			
Name	User Login			
Description	Input	Output	Requirements	Basic Work Flow
Enter login information	ID, Password	Login Successful	Registered Account	Enter Correct Information and press login button. System

				matches the login id and password to display

Table 2.8 Log in to the account

ID	**FR_9**			
Name	User Logout			
Description	Input	Output	Requirements	Basic Work Flow
Logout the system	Click on logout button	The System will logout	Admin must login first	Clicking the logout button will bring back

Table 2.9 Log out of the account

ID	**FR_10**			
Name	User Upload the book			
Description	Input	Output	Requirements	Basic Work Flow
Upload the Book by the User	Click on the Upload picture button	The book will upload	User must be register in the system	Select the format of the book and then click on upload

Table 2.10 Upload the book

ID	**FR_11**			
Name	Listen the content			
Description	Input	Output	Requirements	Basic Work Flow
Listen the content of the book	Select the picture and format.	The content must be listened by user	At least User must be in enrolled first	Click on the paly button to play the video

Table 2.11 Listen the contents of the book

ID	**FR_12**			
Name	Delete the book			
Description	Input	Output	Requirements	Basic Work Flow
Delete the book from the system	User ID	User deleted Successfully.	At least User must be in enrolled first	Search the User by its id and remove book it from

Table 2.12 Delete the book

ID	**FR_13**			
Name	Download the book			
Description	Input	Output	Requirements	Basic Work Flow
Download all videos which is play.	click on the download	The downloaded will successful	At least User must upload the book to play	Click on the download button to download the book video.

Table 2.13 Download the book

ID	**FR_14**			
Name	Remove the garbage text			
Description	Input	Output	Requirements	Basic Work Flow
When the user plays the video than system automatically remove the garbage text.	User play the video of the specific book.	The video will be play without the garbage text.	At least user has uploaded the book which user want to play.	User select the book to play and video will play.

Table 2.14 Remove the garbage text

ID	**FR_15**			
Name	Search book			
Description	Input	Output	Requirements	Basic Work Flow
Search the book from the specific id	Write the book title in the search bar	The book is appeared in the web page	The book must be upload onto the system.	Click on the search option and write the title of the book

Table 2.15 Search the book

ID	**FR_16**			
Name	Pause audio			
Description	Input	Output	Requirements	Basic Work Flow
When the video is paly than user pause or restart the audio want to some break	Paly the video to click on the paly button	User pause the video successfully	At least user has uploaded the book which user want to play.	Chose the book which is play than video is start and pause the video at any time.

Table 2.16 Pause audio

ID	**FR_17**			
Name	Restart audio			
Description	Input	Output	Requirements	Basic Work Flow
When the video is paly than user restart the audio	Paly the video to click on the paly button	User restart the video successfully	At least user has uploaded the book which user want to play.	Chose the book which is play than video is start and restart

want to some break				the video at any time.

Table 2.17 Restart audio

ID	**FR_18**			
Name	Rate the book			
Description	Input	Output	Requirements	Basic Work Flow
When the user listens all the content of the book than user gave the rate to book in the form of stars.	Upload the book the play the video of the book	Video is play successful- ly and user rate the book	At least user paly the video	Chose the book which is play than video is start and then user rate the book according to his taste.

Table 2.18 Rate the book

ID	**FR_19**			
Name	Deactivate the account			
Description	Input	Output	Requirements	Basic Work Flow
User delete his account from the system.	User enter the id and password	And click on the delete button to delete his account.	At least user has the account in the system.	User enter the personal information and delete the account.

Table 2.19 Deactivate the account.

ID	**FR_20**			
Name	Change the password			
Description	Input	**Description**	Requirement	Basic work flow

User change the password	Enter the User ID	User change the password	User must have already account in the system.	User write the current password and then change it new one

Table 2.20 Change the password

ID	**FR_21**			
Name	User to view information			
Description	Input	Output	Requirements	Basic Work Flow
User view his own information from his account	User ID	User profile displayed	At least user must account make in the system	Search the candidate by its id show its Profile.

Table 2.21 Users to view their information

ID	**FR_22**			
Name	User make book public			
Description	Input	Output	Requirements	Basic Work Flow
View has option to make the book public	User select the option of public	The book will be public according to user option	At least user must upload the book in the system.	User select the book to upload and then select the book will public

Table 2.22 Users to make the book public.

ID	**FR_23**
Name	User make book private

Description	Input	Output	Requirements	Basic Work Flow
View has option to make the book private	User select the option of private	The book will be private according to user option	At least user must upload the book in the system.	User select the book to upload and then select the book will private

Table 2.23 Users to make the book private.

ID	**FR_24**			
Name	Text highlighted			
Description	Input	Output	Requirements	Basic Work Flow
When the system read the book, the text is automatically highlighted	User click on the paly button to play the video.	According to the voice the text is also highlighted and user can see it.	At least user must upload the book and play the video.	User select the book to upload and then select it either public or private.

Table 2.24 Text is highlighted

2.4 User Characteristics:

User should be familiar with the basic flow and usage of system that includes normal operations such as log in, logout, sign up etc. Other than that, the system is designed to be quite simple and too easy to use to attract maximum users and it does not need any technical knowledge or special expertise to operate it.

2.5 Constraints

As it is a web system so the user to have any device, for example, PC or tablet with dynamic web association and a program to get to the system. The system constraints that are consist in our system are as follow:

2.5.1 Safety and security considerations

Our system is secure and supported by the regulations of the protection standards. Its data is secure and are tend to use in the positive considerations to produce the prediction of diabetes.

2.5.2 Control Functions

Our Control work is intended to control the general procedures and working of the product framework. In the control work we first assemble the prerequisites that how our framework functions and how necessities can be accumulating to make a brief framework. At that point, dissect the framework takes places.

2.5.3 Unwavering quality necessities

The unwavering quality necessity is corresponding to the quantity of the restricted quantities of the applicants in the framework in light of the fact that our database is constrained, and we are proposed our undertaking in the restricted degree. Second unwavering quality alternative is taking the fair number of the snaps in such a case that the snaps surpass it will require some investment to be execute.

2.6 Assumptions and Dependencies

2.6.1 Assumptions

It is assumed that the users using the system will be familiar with the basic website operations such as log in, logout, sign up etc. Every user using the website has a device with active internet connection. A module in our system depends upon the proper integration of google maps with the website. If this does not happen, the functionality of that module will be compromised.

2.6.2 Dependencies

The system is fully dependent to the machine learning libraries if any of the libraries is missing from the project file than web portal is not working write in the convenient way and system must not work well.

2.6.3 Apportioning of requirements:

The apportion of the requirements is depends on the complexity of the system when developing. If some changes take places and some requirements are need than it will be release in second version of system.

2.7 Specific requirement:

2.7.1 Functional Requirement:

Administration:

1. System shall allow the admin to log in to the account
2. System shall allow the admin to Log out of the account
3. System shall allow the admin to Deactivate the account
4. System shall allow the admin to Admin to remove the user
5. System shall allow the admin to Change the password

6. System shall allow the admin to view user's statistics
7. System shall allow the admin to remove the user.

User:

1. System shall allow the users to sign up for application.
2. System shall allow the users to login to the application.
3. System shall allow the users to logout from the application.
4. System shall allow the users to upload the book.
5. System shall allow the users to listen the contents of the book.
6. System shall allow the users to delete the book.
7. System shall allow the users to download the book.
8. System shall remove the garbage text.
9. System shall allow the users to search the book.
10. System shall allow the user to play the video.
11. System shall allow the user to pause the video.
12. System shall allow the users to rate the book.
13. System shall allow the users to deactivate their accounts.
14. System shall allow the users to change their passwords.
15. System shall allow the users to view their account information.
16. System shall allow the users to read the book.
17. System shall allow the user to make the book public.
18. System shall allow the user to make the book private.

2.7.2 Non-Functional Requirements

Usability

As our application is for kids so the interface of our system will be easy to use and learn. We will make our interface interactive so that kids got attracted. Users can fulfill the task easily with less or no chances of error. In case, user faces some difficulty while performing task we will provide the help facility. User needs no special training to understand the interface; a beginner will start using it after two or three interactions.

Performance

System will be efficient and optimized for better performance. Response time will be as low as possible. Number of users that can access the system at a time depends on the limit provided by the server.

Reliability

The user will get the accurate result of the uploaded book. System generates the video in accurate format.

Extensibility

We will be making scalable application so it will be easy to extend the application without any difficulty.

Maintainability

The maintainability is divided into the number of the time spans. It is easy to maintain ad can be checked of maintenance time to time according to the need. The supposed time to maintain is three months.

Design Constraints

Design constraints are the number of the candidates and data at a time and the number of saved participants because of limited scale.

2.7.3 Security

The system should be handled only by the administrator and authorized users. Only the administrator has right to assign permission like creating new accounts and maintain user logins. Only authorized users can access the system with username and password. The academy is a public sector and they have confidential data which must be secured from the unauthorized user.

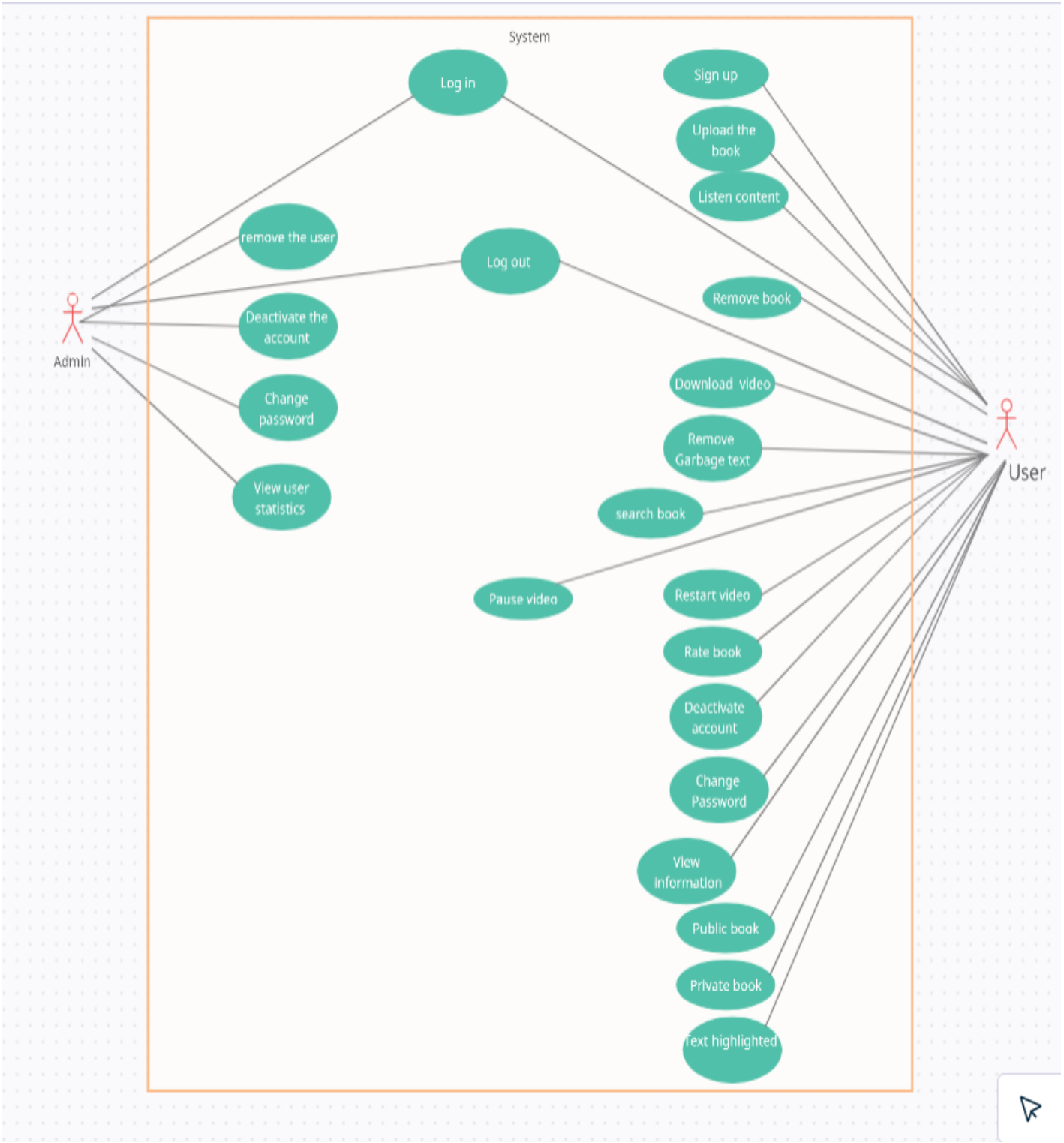
2.7.4 License Agreement

For the official release of our system, we must make a license agreement with Punjab Emergency Services Academy Rescue 1122 for the legal use of this system by the recruit of Pakistan for the PES Academy

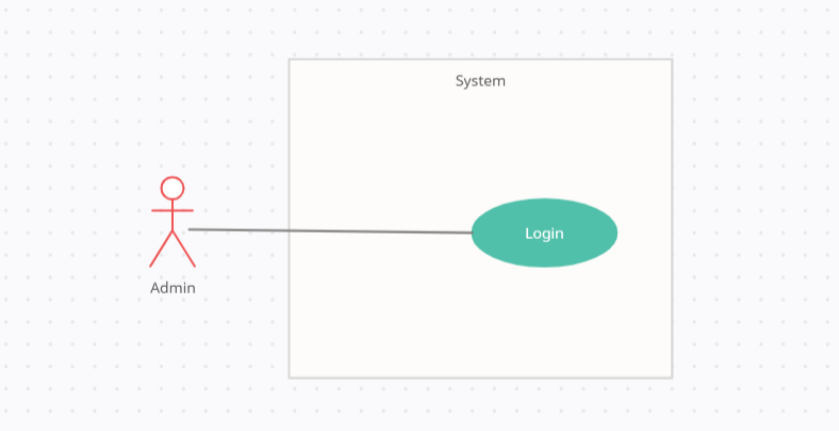
CHAPTER 3

DESIGN AND METHODOLOGY

3.1 Use Cases

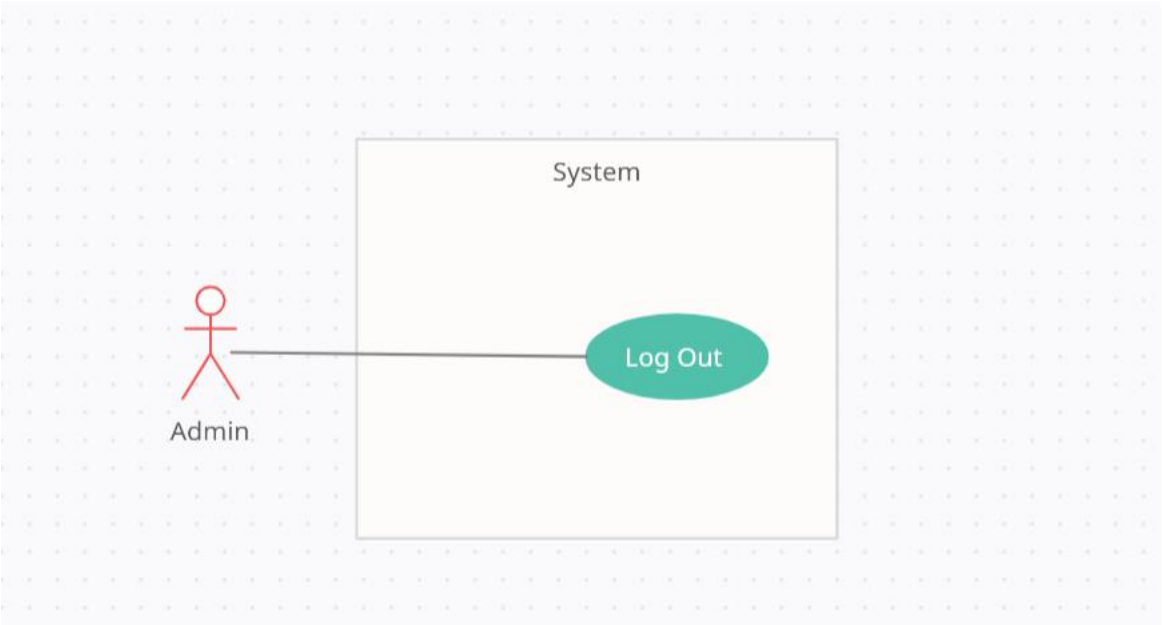


3.1.1 Admin Log In:



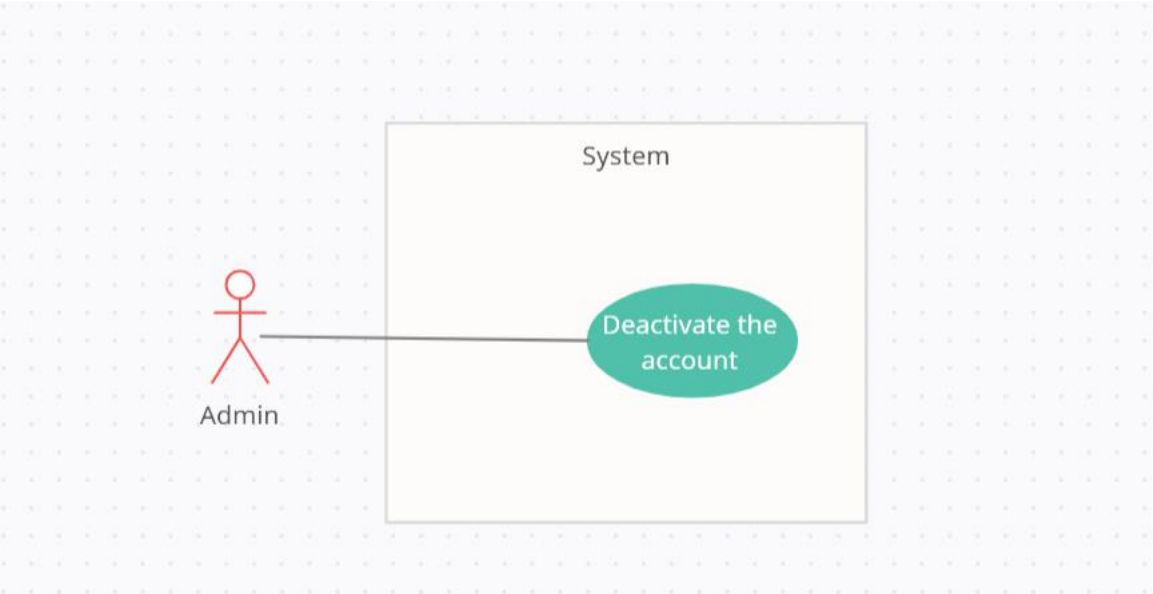
Use Case ID:	1		
Name	Login		
Actors	Admin		
Description	Admin can Login as a user to the website.		
Pre-Conditions	Admin must register before login.		
Post-Conditions	Admin can be able to login.		
Basic Flow			
Actor Action		**System Response**	
1	User clicks on the login button.	2	System displays the input fields.
3	User fills his login information.		
4	User clicks on the login button.	5	System takes the input and verifies it from the database and responds accordingly.
Alternative Flow			
3-A	User click on the sign in with Google.	3-B	System generates API calls and verifies user info and responds accordingly.

3.1.2 Admin Log Out:



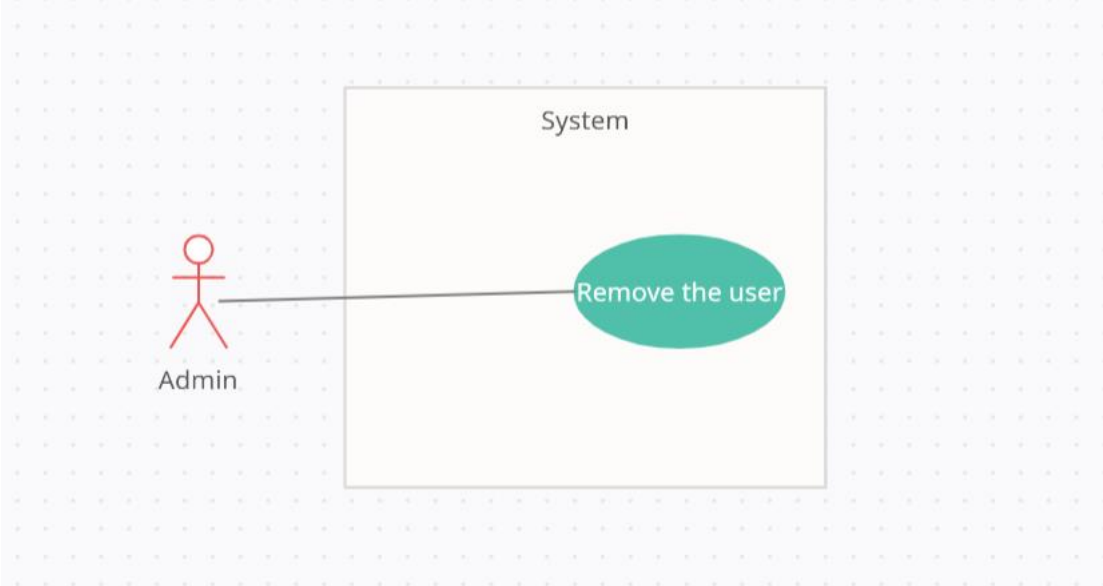
Use Case ID:	2		
Name	Logout		
Actors	Admin		
Description	Admin can Log out as a user to the website.		
Pre-Conditions	Admin must be login into his account.		
Post-Conditions	Admin can't be able to see his books.		
Basic Flow			
Actor Action		**System Response**	
1	User clicks on the logout button.	2	System logout the user and move to the home page.

3.1.3 Admin Deactivate Account:



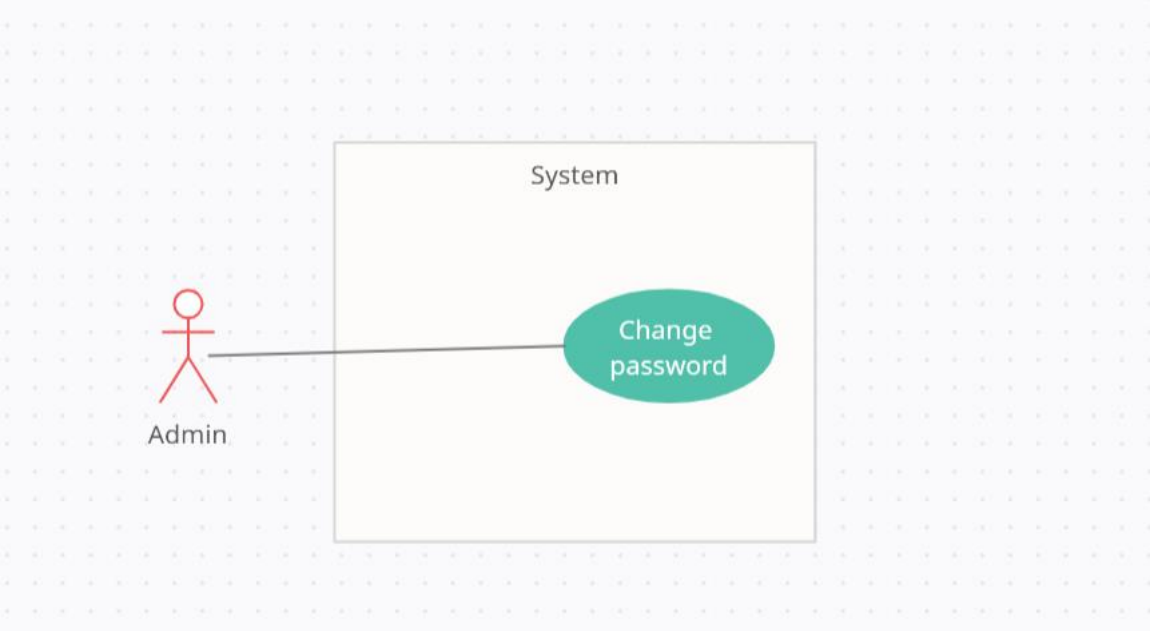
Use Case ID:	3		
Name	Deactivate		
Actors	Admin		
Description	Admin can deactivate his account.		
Pre-Conditions	Admin must be registered and he must be login to his account.		
Post-Conditions	Admin can't be able to login using these credentials.		
Basic Flow			
Actor Action		**System Response**	
1	User clicks on the deactivate button.	2	System prompts for the password.
3	User gives password.	4	System verifies the password and deletes the user account from the database and logout the user.
Alternative Flow			
3-A	User click on cancel button.	3-B	System closes the prompt.

3.1.4 Admin Remove User:



Use Case ID:	15		
Name	Remove User		
Actors	Admin		
Description	The admin can remove the user.		
Pre-Conditions	The admin must sign in and select the user.		
Post-Conditions	Remove the user and that user can’t be able to login again.		
Basic Flow			
Actor Action		**System Response**	
1	User clicks on the remove button.	1	User clicks on the remove button.
3	The user clicks the confirm button.	3	The user clicks the confirm button.
Alternative Flow			
3-A	The user clicks the cancel button.	3-A	The user clicks the cancel button.

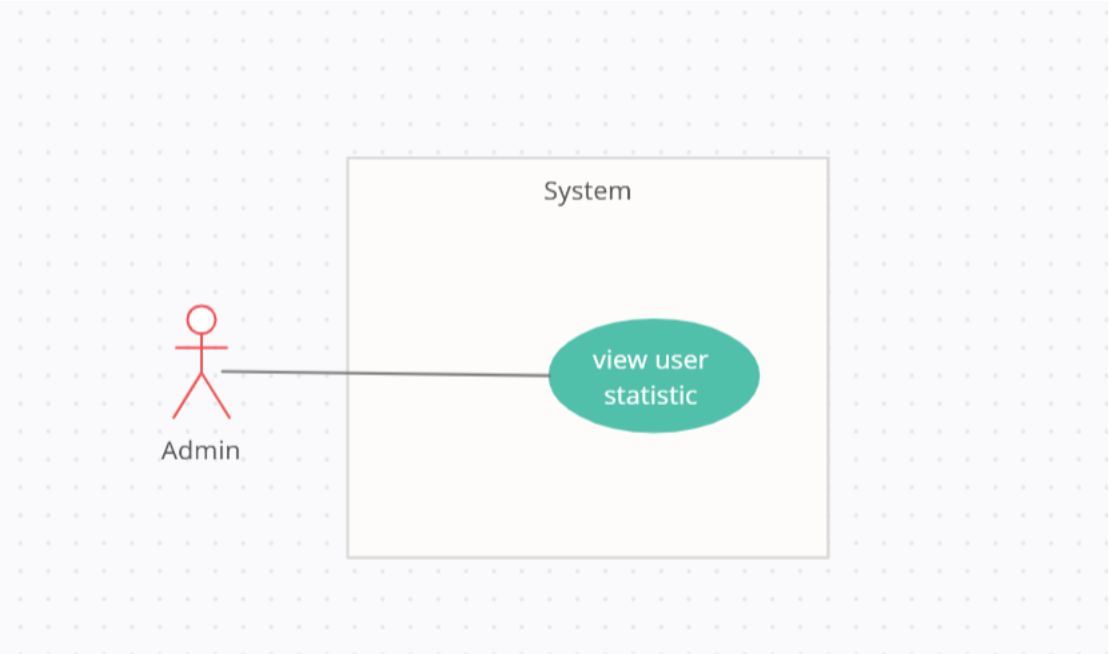
3.1.5 Admin Change Password:



Use Case ID:	5
Name	Change Password
Actors	Admin
Description	The admin can change the password.
Pre-Conditions	The admin must sign in and opens account information page.
Post-Conditions	Change the password.

Basic Flow			
Actor Action		**System Response**	
1	User clicks on the change password button.	2	System displays page asking for old password and new password.
3	User enters passwords.	4	System verifies old password from data base and if it matches then system updates the user new password.
Alternative Flow			
3-A	The user enters password	4-A	System verifies old password from data base and if it does not match then system displays an error message.

3.1.6 Admin View User Statistics:

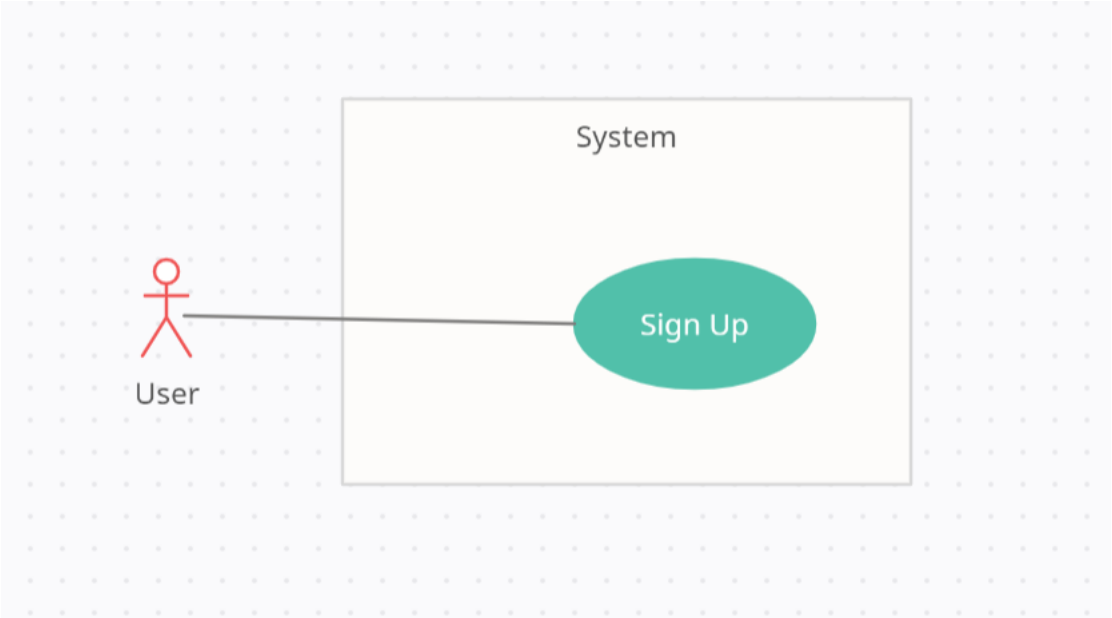


Use case ID:	6
Name	View User statistics
Actors	Admin
Description	The admin can view all the details of all the users
Pre-Conditions	The admin must log in
Post-Conditions	View user details

Basic Flow

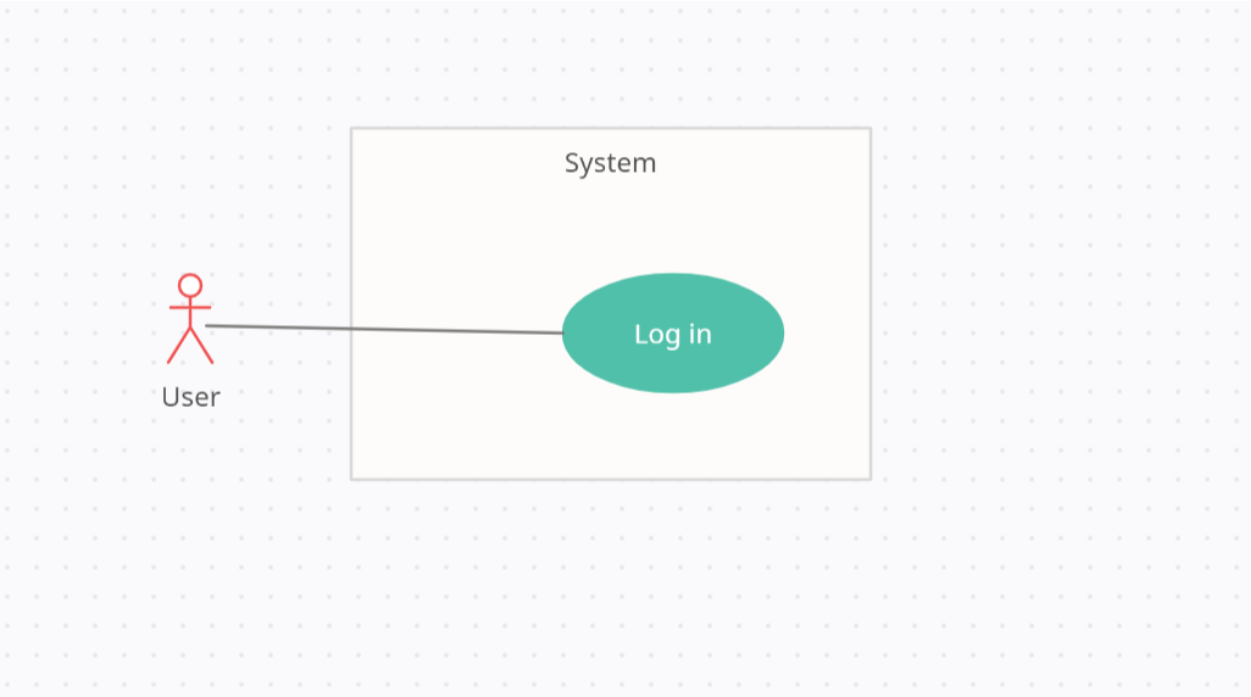
Actor Action		**System Response**	
1	Admin clicks on users on his home page	2	System displays a new page showing all the users
3	Admin selects any user from the list	4	System displays page showing user's details

3.1.7 Sign Up



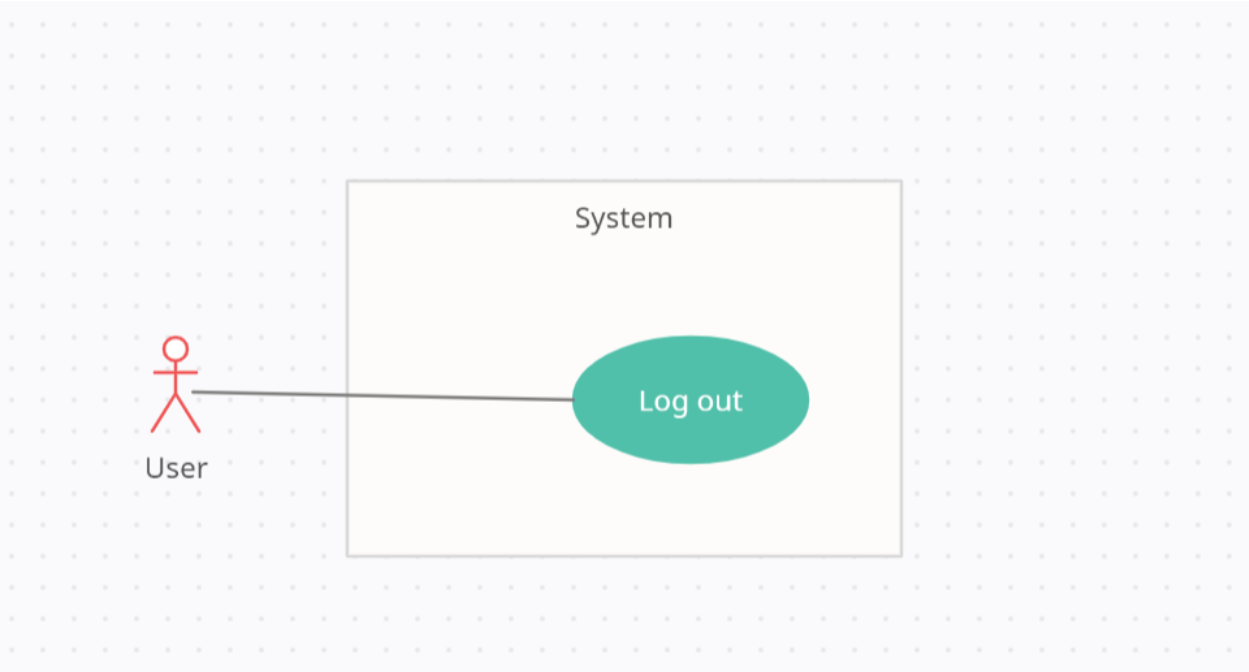
Use Case ID:	7		
Name	Signup		
Actors	User		
Description	User can sign up to the website and become member of the website.		
Pre-Conditions	User should have an internet connection and his details.		
Post-Conditions	User's account is created and he can be able to login successfully.		
Basic Flow			
Actor Action		**System Response**	
1	User clicks on create an account button.	2	System displays the input fields.
3	User fills in the information.		
4	User clicks on the sign-up button.	5	System takes the input and stores it in a database and displays the home page.
Alternative Flow			
3-A	User clicks on the sign up with Google.	3-B	System generates API call and responds accordingly.

3.1.8 User Log In:



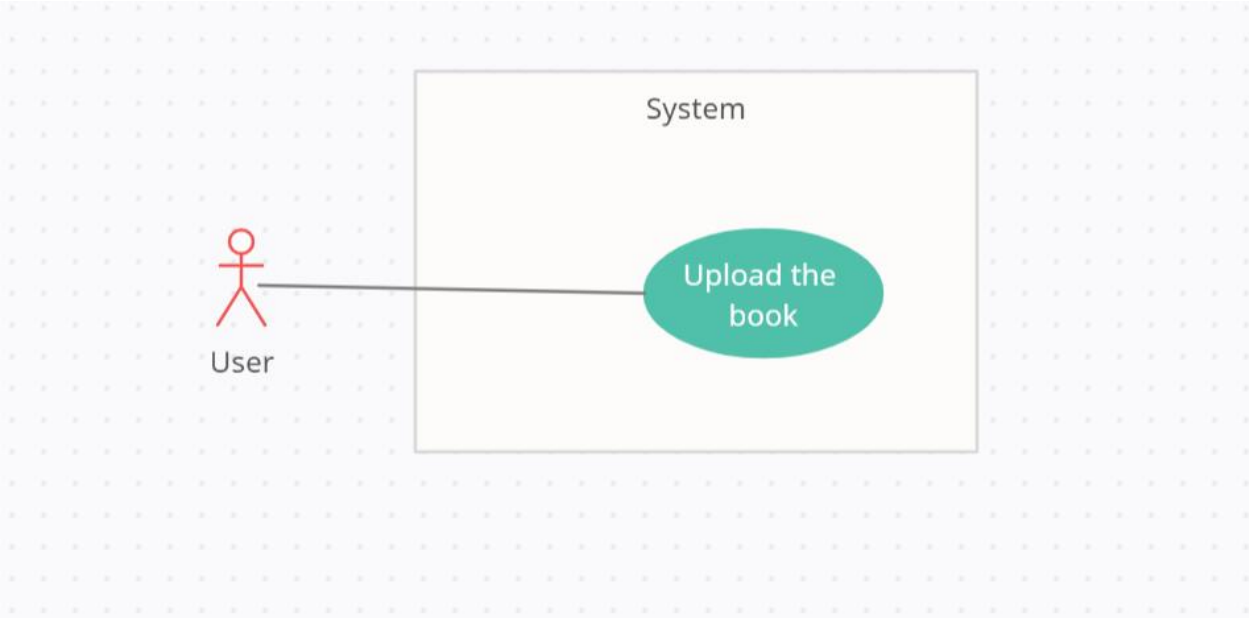
Use Case ID:	8		
Name	Login		
Actors	User		
Description	User can Login as a user to the website.		
Pre-Conditions	User must register before login.		
Post-Conditions	User can be able to login.		
Basic Flow			
Actor Action		**System Response**	
1	User clicks on the login button.	2	System displays the input fields.
3	User fills his login information.		
4	User clicks on the login button.	5	System takes the input and verifies it from the database and responds accordingly.
Alternative Flow			
3-A	User click on the sign in with Google.	3-B	System generates API calls and verifies user info and responds accordingly.

3.1.9 User Log Out:



Use Case ID:	9		
Name	Logout		
Actors	User		
Description	Users can Log out as a user to the website.		
Pre-Conditions	User must be login into his account.		
Post-Conditions	User can't be able to see his books.		
Basic Flow			
Actor Action		**System Response**	
1	User clicks on the logout button.	2	System logout the user and move to the home page.

3.1.10 Upload Book



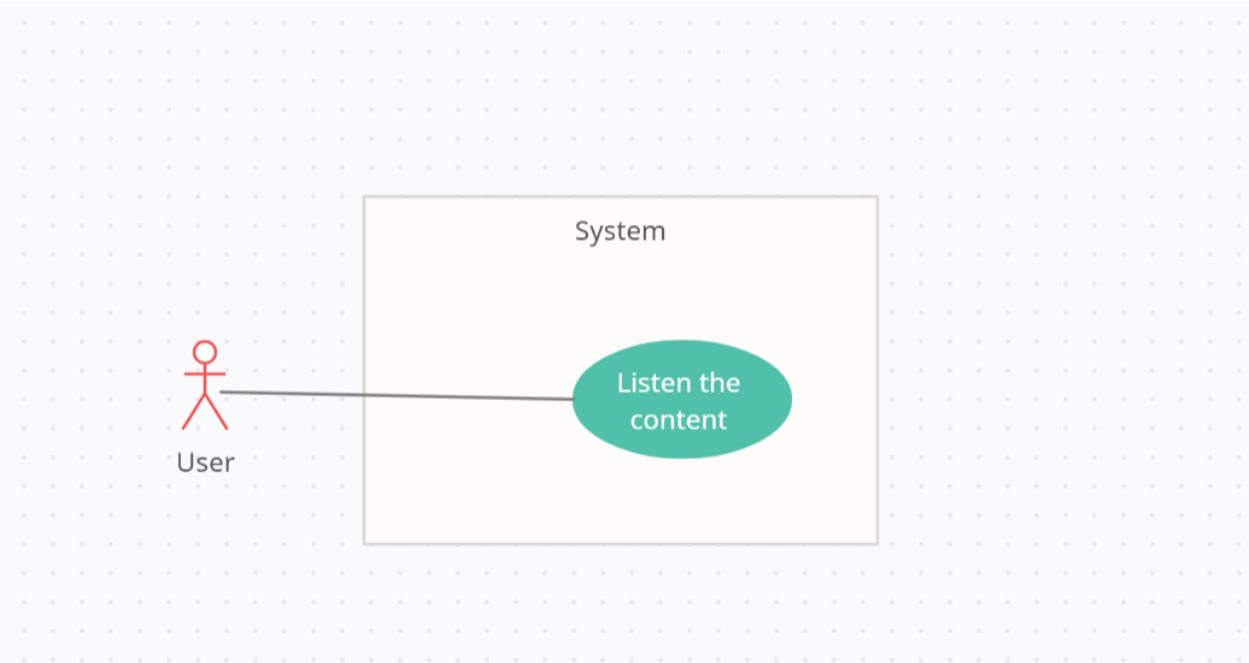
Use Case ID:	10
Name	Upload a book
Actors	User
Description	User can upload a book in the form of images so that he can listen to that book.
Pre-Conditions	User should already login
Post-Conditions	User can upload any book in the form of images and redirected towards listening functionality.

Basic Flow

Actor Action		**System Response**	
1	The user opens the home page.	2	The home page is displayed asking for uploading a book.
3	The user clicks on the upload button.	4	System display pop-up screen.
5	User can click on the add file button.	6	File uploads widget shown to the user.
7	User selects a desired PDF to upload.		
8	User clicks on the upload Button.	9	Files are uploaded to the system and ask for book details.
10	User enters details of the book and click on Done button.	11	Book is processed and stored in database.

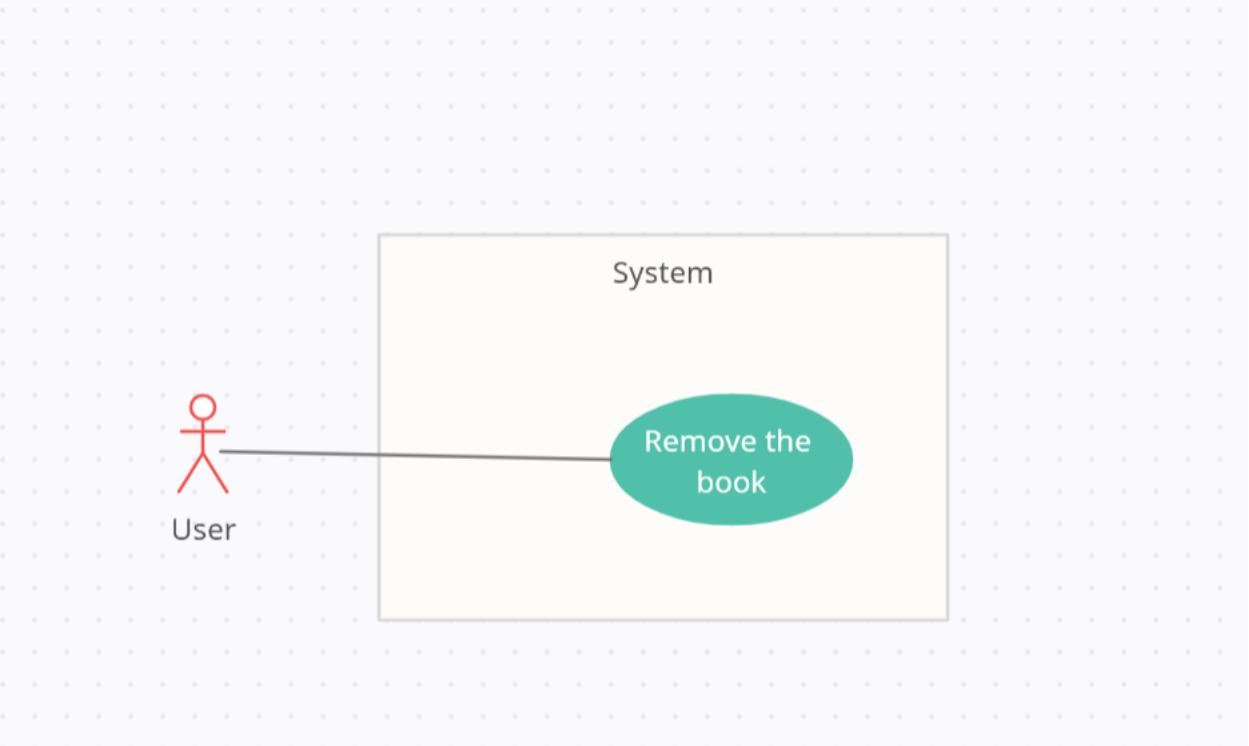
Alternative Flow			
5	User can drag desired files.		
7	User selects a desired set of images to upload.		

3.1.11 Listen Book



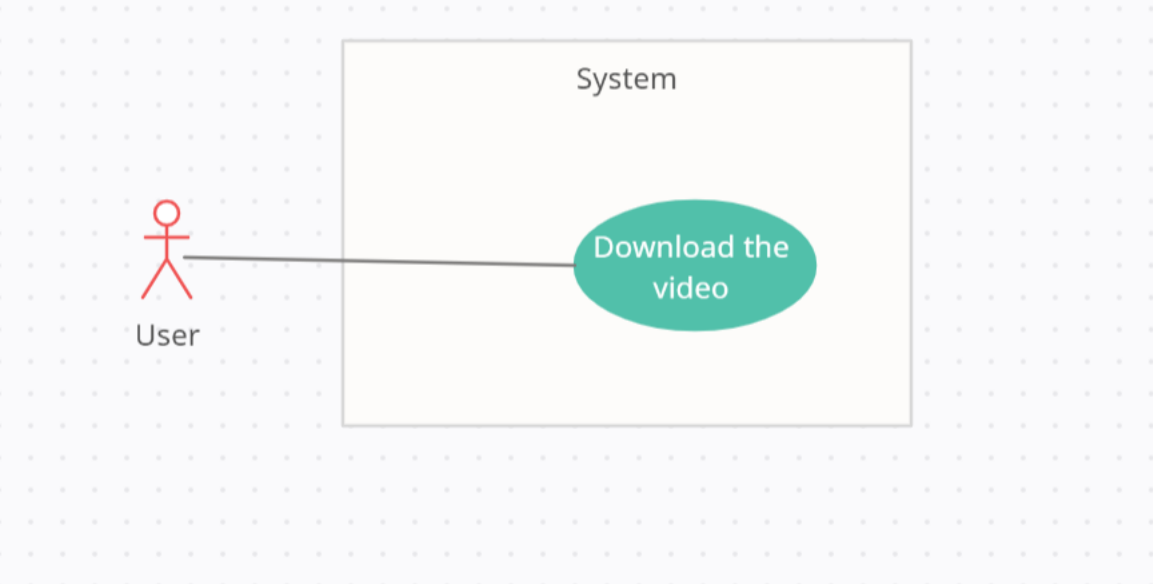
Use Case ID:	11		
Name	Listen a Book		
Actors	User		
Description	The user can listen to the uploaded book.		
Pre-Conditions	The user must upload book or open the already uploaded book.		
Post-Conditions	User can successfully hear the book reading by the system.		
Basic Flow			
Actor Action		**System Response**	
1	The user clicks on the play button.	2	System processes the current page, start reading the current page and also highlight the word which is currently speaking by the system.

3.1.12 Remove Book



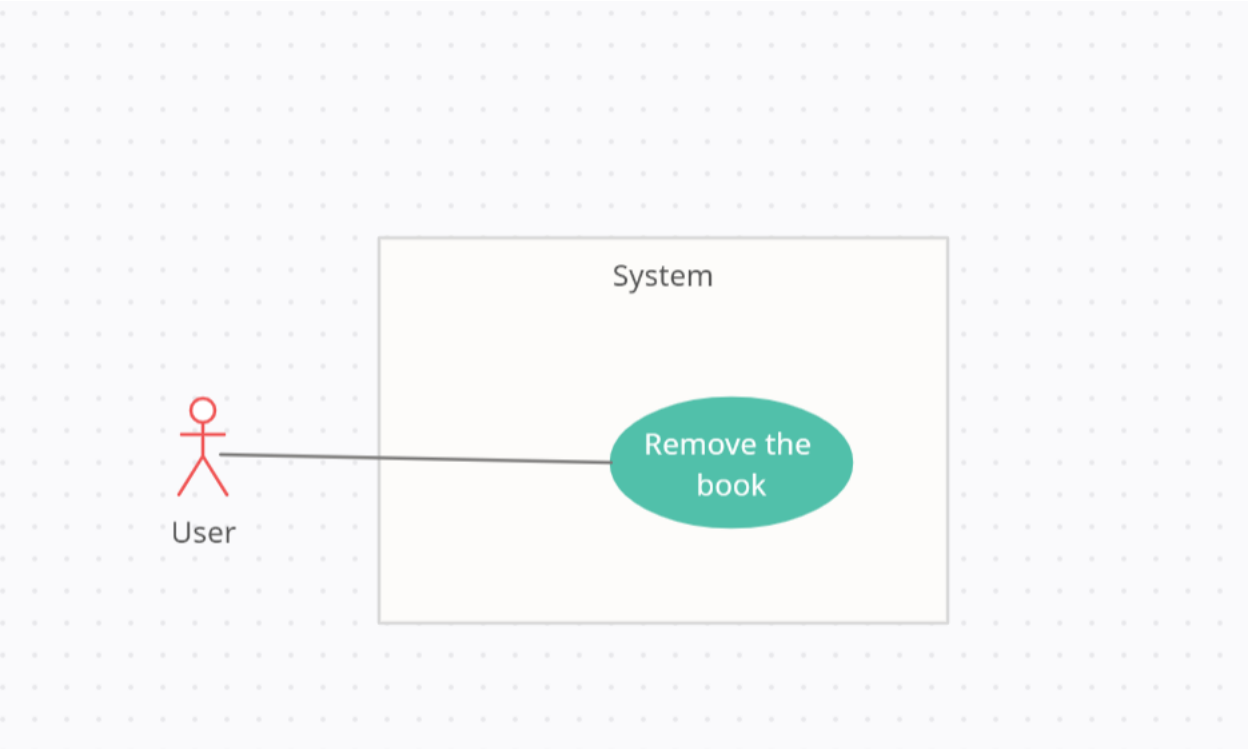
Use case ID	12		
Name	Remove book		
Actors	User		
Description	The user can remove the uploaded book.		
Pre-Conditions	The user must upload a book and open it.		
Post-Conditions	Remove the current book and can't be able to listen the book.		
Basic Flow			
Actor Action		**System Response**	
1	User clicks on the remove button.	2	Confirmation pop-up is displayed by the system.
3	The user clicks the confirm button.	4	System deletes the book and navigates to the home page.
Alternative Flow			
3-A	The user clicks the cancel button.	4-A	System hides the confirmation pop-up.

3.1.13 Download Book



Use Case ID:	13		
Name	Download Book.		
Actors	User		
Description	The user can download the book in the form of video.		
Pre-Conditions	The user must select the book which he wants to download.		
Post-Conditions	Successfully download the video of the current book.		
Basic Flow			
Actor Action		**System Response**	
1	User clicks on the download button.	2	System processes the video of the book and then starts download.

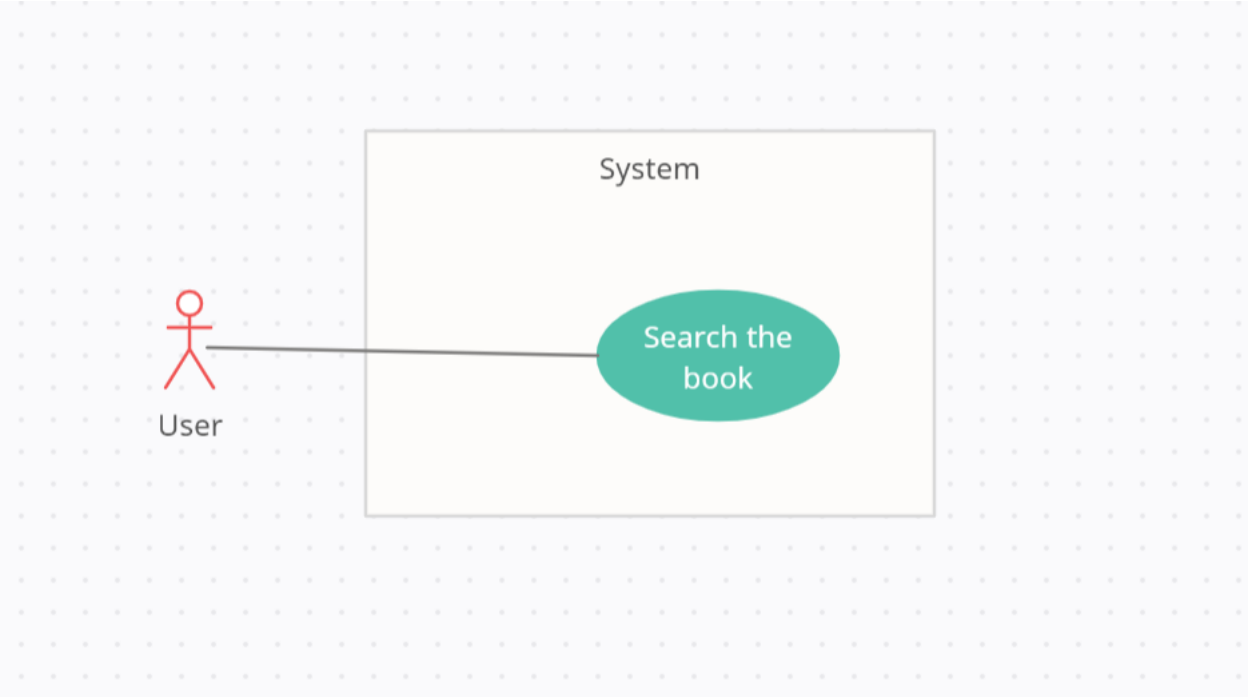
3.1.14 Remove the garbage text:



Use Case ID:	14
Name	Remove the garbage text.
Actors	User
Description	The user automatically removes the garbage of the text.
Pre-Conditions	The user must select the book which he wants to remove the garbage.
Post-Conditions	Successfully remove the garbage of the page.

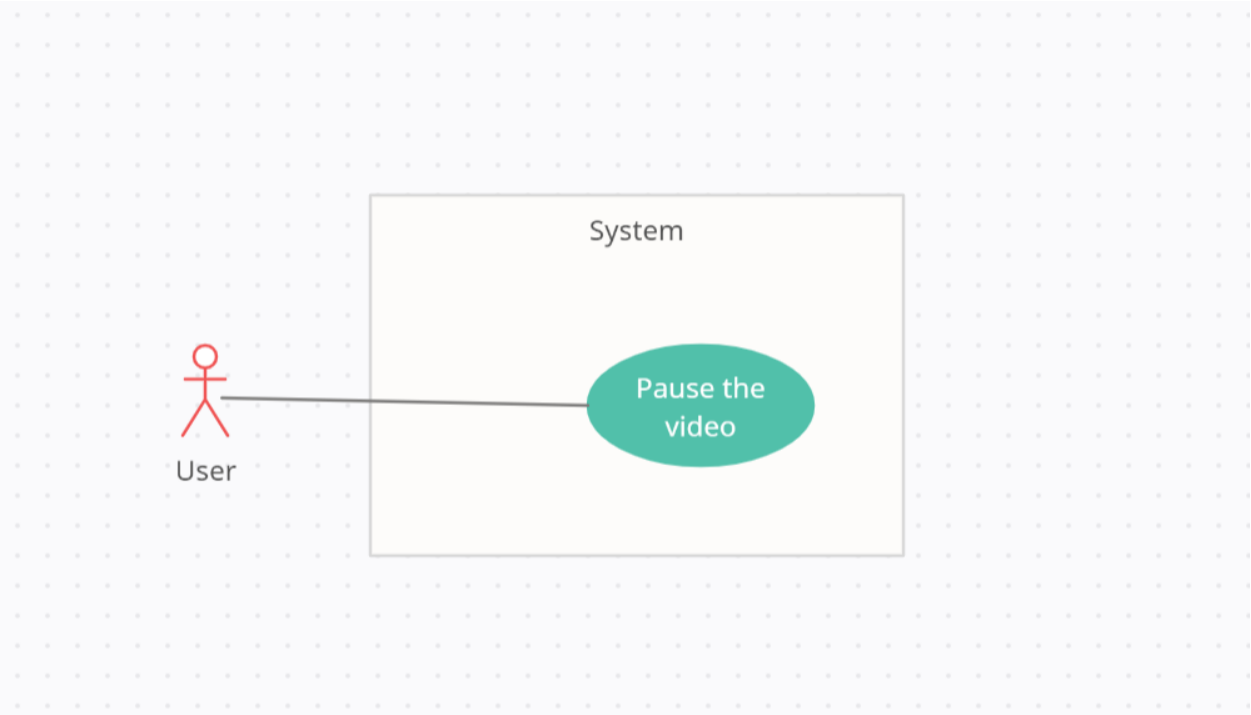
Basic Flow			
Actor Action		**System Response**	
1	User clicks to play the video of the book	2	System processes the book and paly the video after removes un-read data.

3.1.15 Search Book



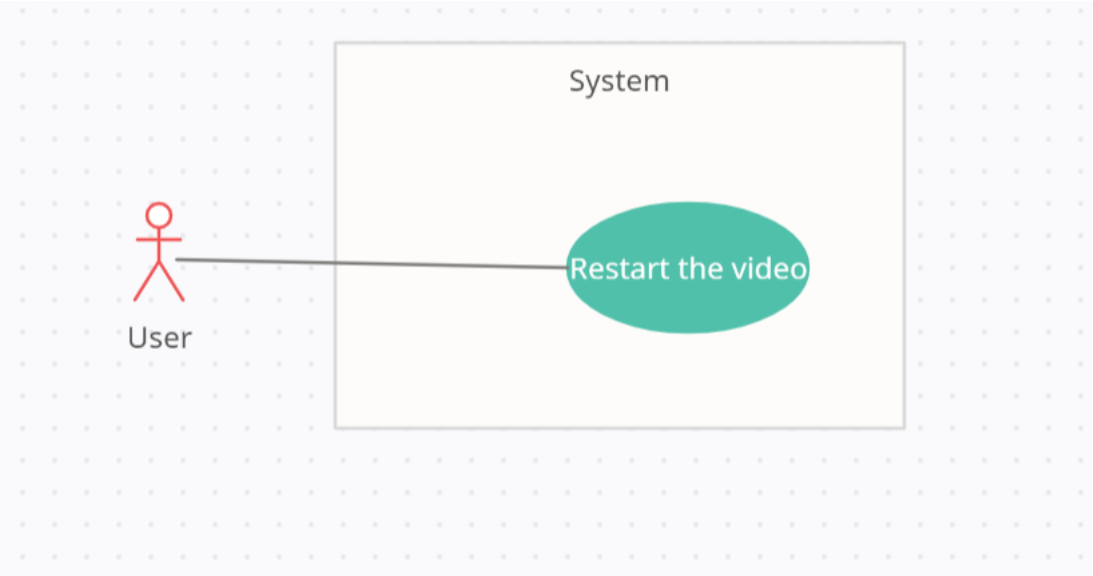
Use Case ID:	15		
Name	Search Book.		
Actors	User		
Description	The user can search a book.		
Pre-Conditions	The book must be publicly available by any of the user.		
Post-Conditions	User can listen and download the video of the book.		
Basic Flow			
Actor Action		**System Response**	
1	User clicks on the search bar.		
2	Type name of the book.	3	System matches the name with publicly available books and displays the matched books.

3.1.16 Pause Audio



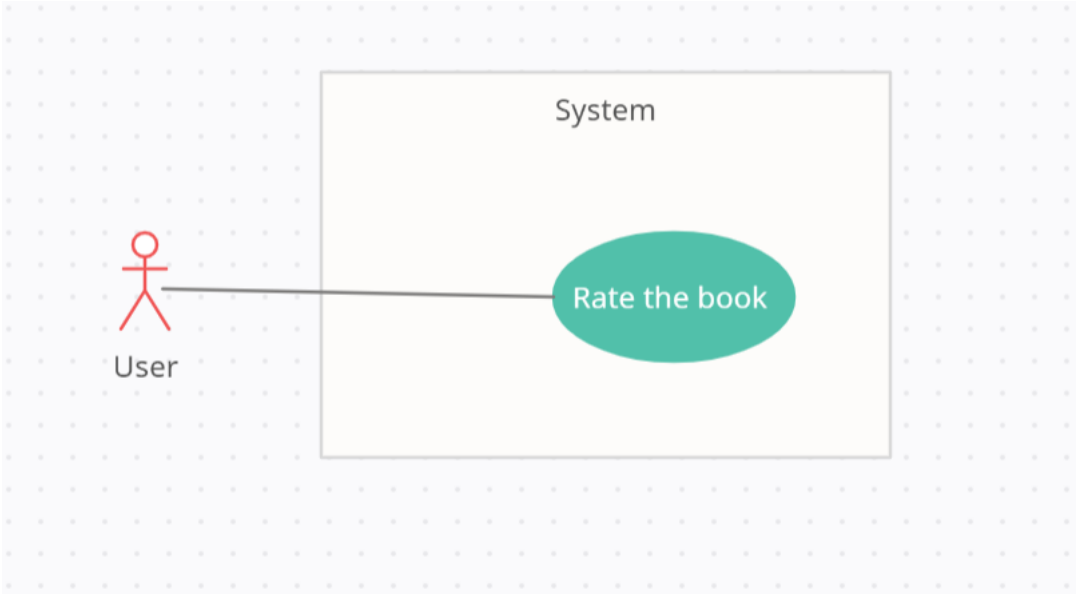
Use Case ID:	16		
Name	Pause Audio		
Actors	User		
Description	The user can pause the listening of a book.		
Pre-Conditions	The user must start listening to a book.		
Post-Conditions	User can successfully pause the book which he was listening to by the system.		
Basic Flow			
Actor Action		**System Response**	
1	The user clicks on the pause button.	2	System pauses the book video.

3.1.17 Restart Audio



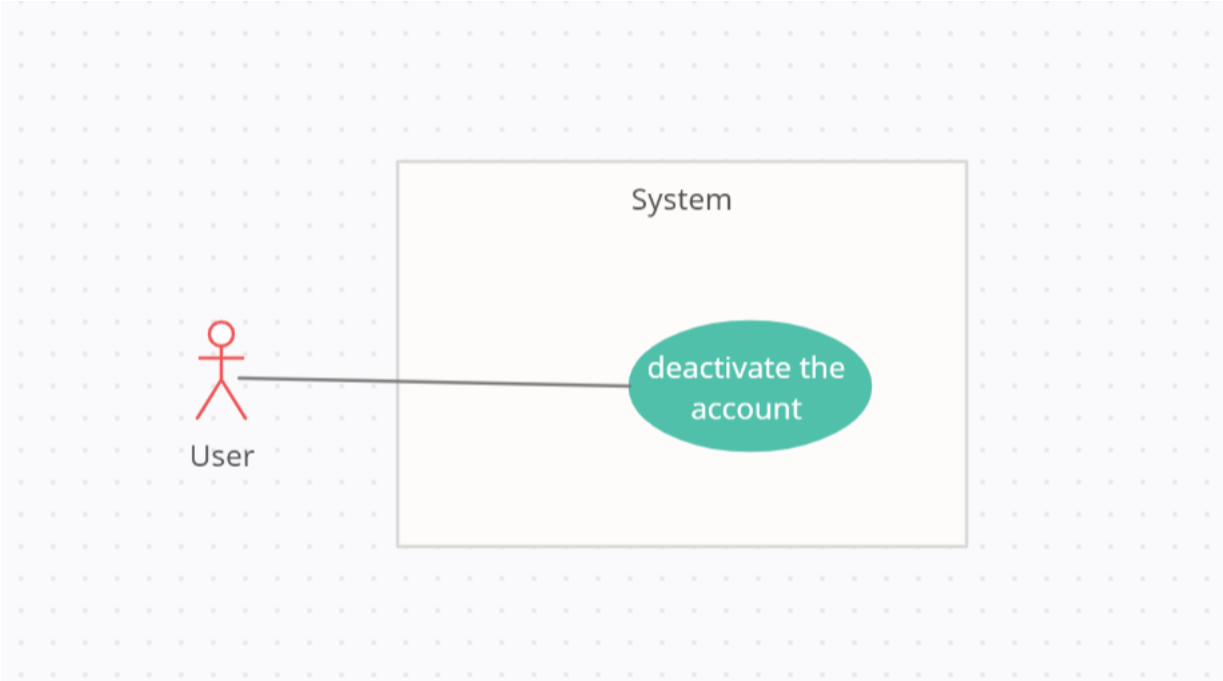
Use Case ID:	17		
Name	Restart Audio		
Actors	User		
Description	The user can restart listening of a book.		
Pre-Conditions	The user must open a book.		
Post-Conditions	User can successfully start listening book by the system.		
Basic Flow			
Actor Action		**System Response**	
1	The user clicks on the restart button.	2	System starts the book video from start.

3.1.18 Rate Book



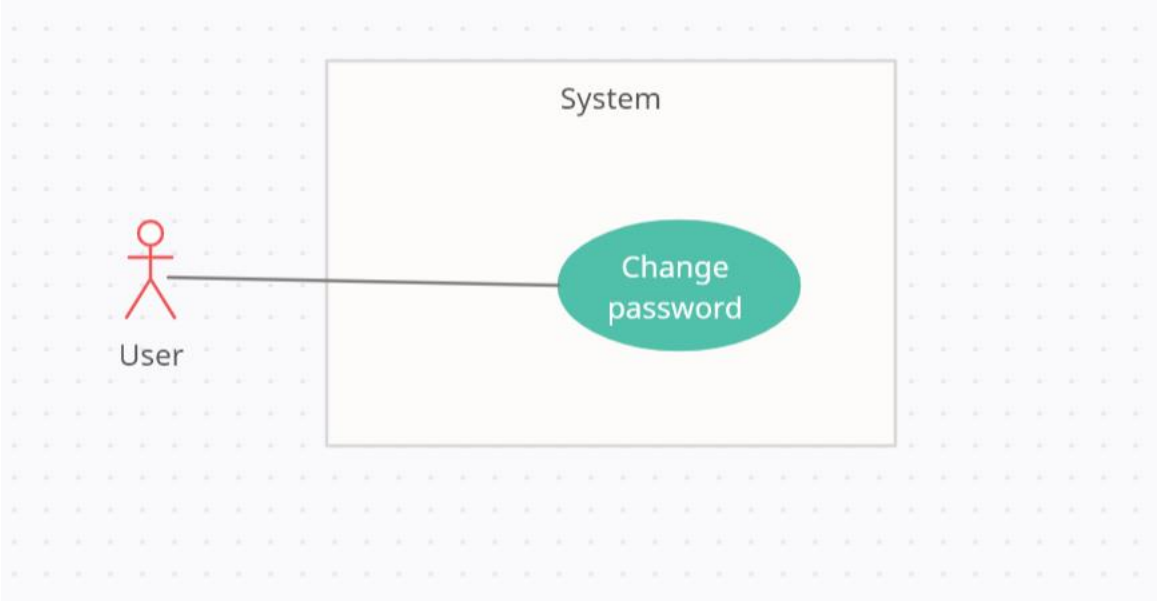
Use Case ID:	18		
Name	Rate a Book		
Actors	User		
Description	The user can rate through a numerical rating scale a book.		
Pre-Conditions	The user must finish listening to a book which he wants to rate.		
Post-Conditions	User can successfully rate a book.		
Basic Flow			
Actor Action		**System Response**	
1	The user clicks on the rating scale.	2	System calculates new rating and update the book's rating.

3.1.19 User Deactivate Account:



Use Case ID:	19		
Name	Deactivate		
Actors	User		
Description	User can deactivate his account.		
Pre-Conditions	User must be registered and he must be login to his account.		
Post-Conditions	User can't be able to login using these credentials.		
Basic Flow			
Actor Action		**System Response**	
1	User clicks on the deactivate button.	2	System prompts for the password.
3	User gives password.	4	System verifies the password and deletes the user account from the database and logout the user.
Alternative Flow			
3-A	User click on cancel button.	3-B	System closes the prompt.

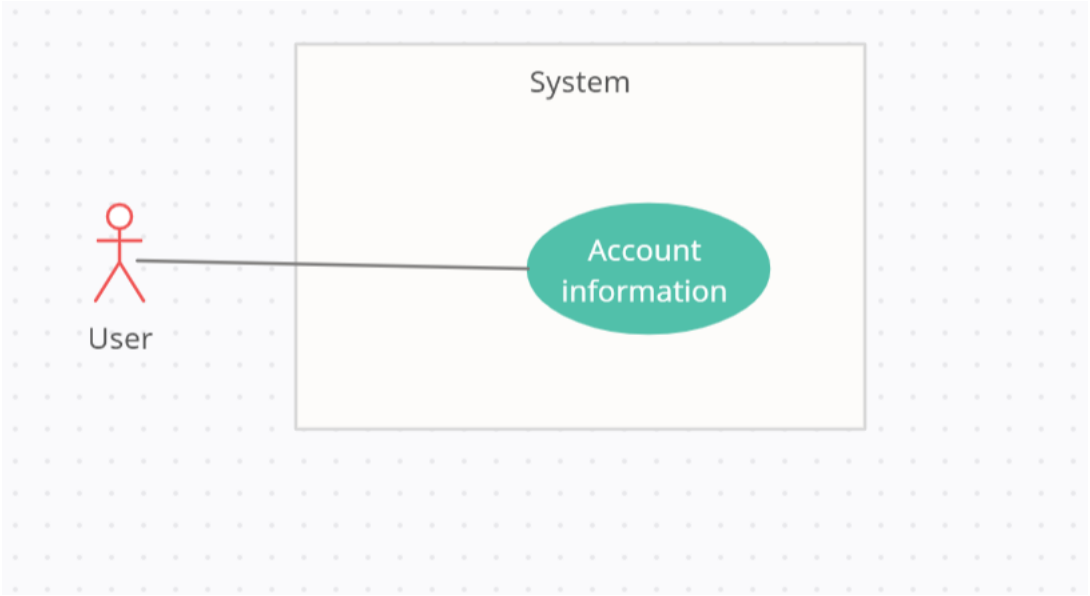
3.1.20 Change Password



Use case ID	20
Name	Change Password
Actors	User
Description	The user can change the password.
Pre-Conditions	The user must sign in and opens account information page.
Post-Conditions	Change the password.

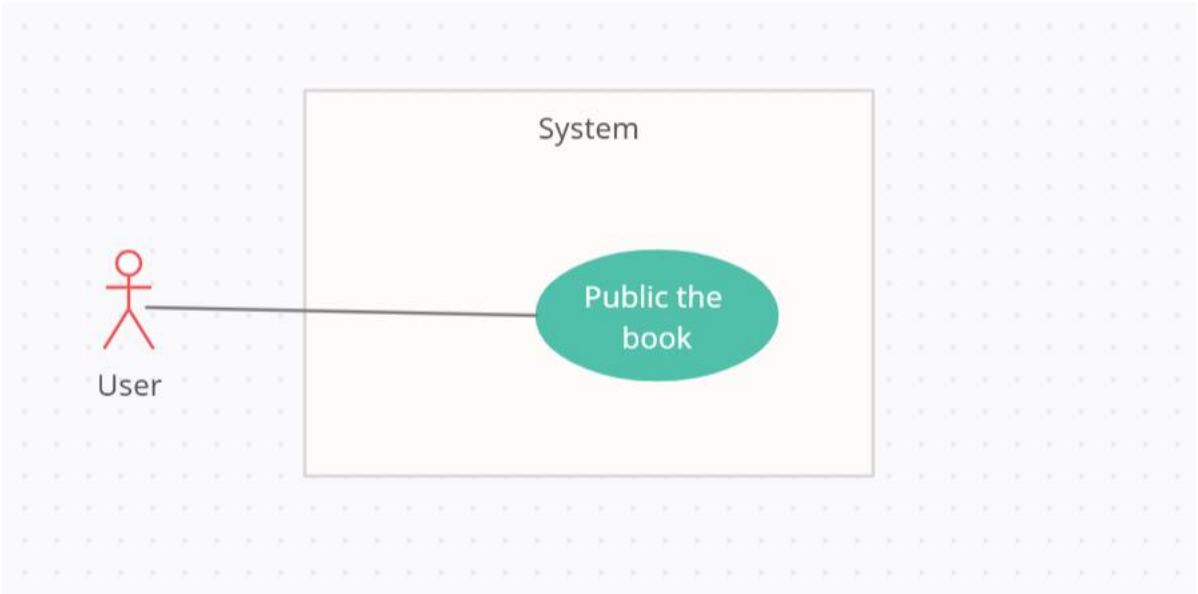
Basic Flow			
Actor Action		**System Response**	
1	User clicks on the change password button.	2	System displays page asking for old password and new password.
3	User enters passwords.	4	System verifies old password from data base and if it matches then system updates the user new password.
Alternative Flow			
3-A	The user enters password	4-A	System verifies old password from data base and if it does not matches then system displays an error message.

3.1.21 Account Information



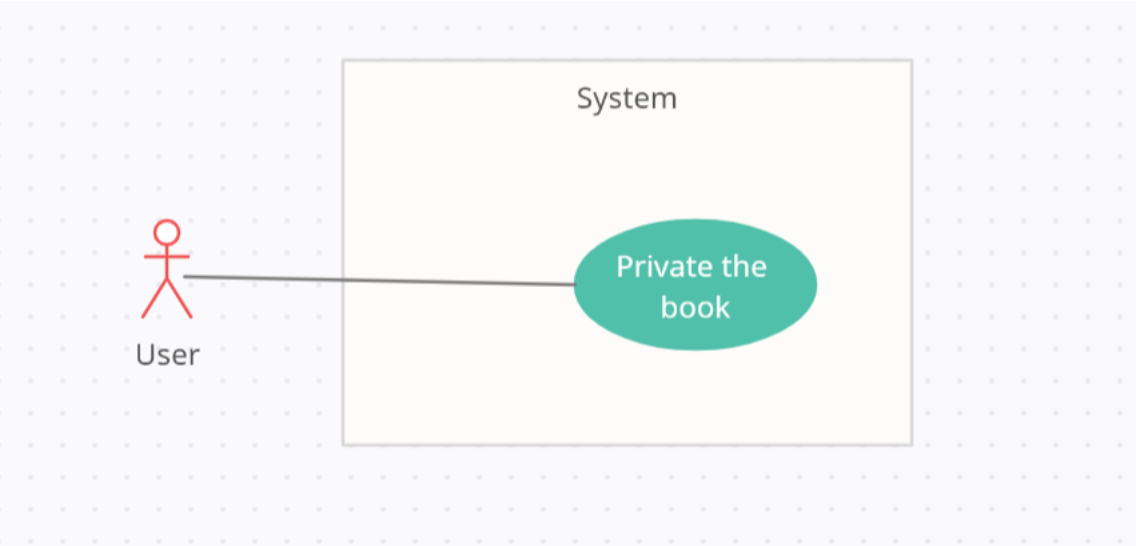
Use case ID	21		
Name	Account Information		
Actors	User		
Description	The user can view his account information.		
Pre-Conditions	The user must log in		
Post-Conditions	View account information		
Basic Flow			
Actor Action		**System Response**	
1	User clicks on the profile button.	2	System displays a drop-down menu
3	User clicks on account info button from the menu.	4	System displays page showing user his account details

3.1.22 Public Book



Use Case ID:	22		
Name	Public book		
Actors	User		
Description	The user can make his book publicly available to all users.		
Pre-Conditions	The user must select his private book.		
Post-Conditions	This book is available to everyone and they can listen to this book.		
Basic Flow			
Actor Action		**System Response**	
1	User clicks on the public switch button.	2	Confirmation pop-up is displayed by the system.
3	The user clicks the confirm button.	4	System changes the status of the book and makes it publicly available.
Alternative Flow			
3-A	The user clicks the cancel button.	4-A	System hides the confirmation pop-up.

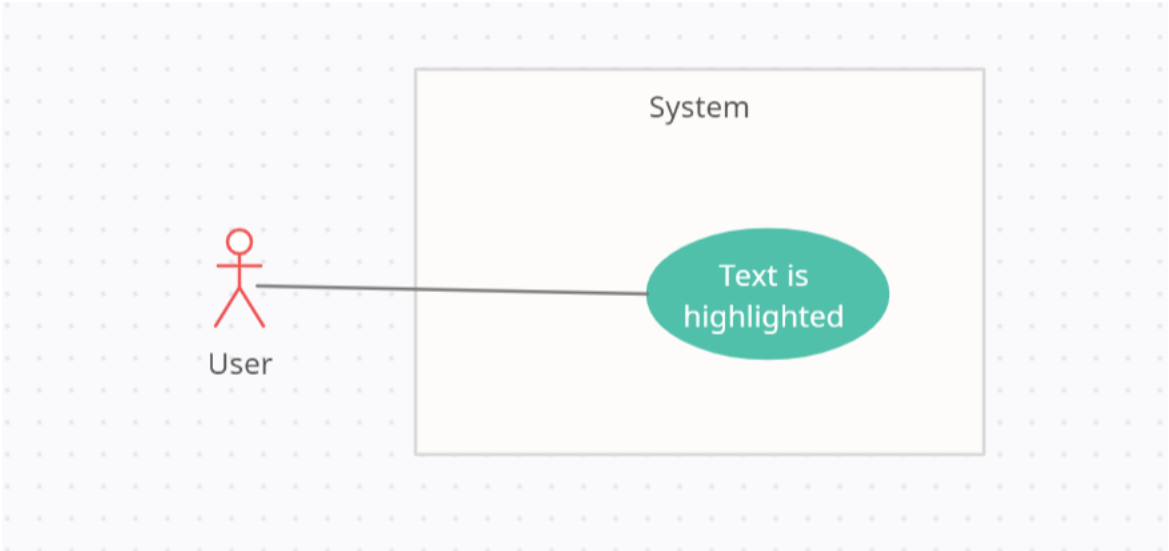
3.1.23 Private Book



Use Case ID:	23
Name	Private book
Actors	User
Description	The user can make his book private.
Pre-Conditions	The user must select his publicly available book.
Post-Conditions	No one except himself can listen to his book.

Basic Flow			
Actor Action		**System Response**	
1	User clicks on the private switch button.	2	Confirmation pop-up is displayed by the system.
3	The user clicks the confirm button.	4	System changes the status of the book and makes it private.
Alternative Flow			
3-A	The user clicks the cancel button.	4-A	System hides the confirmation pop-up.

3.1.24 Text is highlighted



Use Case ID:	24		
Name	Text is highlighted		
Actors	User		
Description	When the user plays the video the according to voice the text is highlighted.		
Pre-Conditions	The user must select the book to play.		
Post-Conditions	The text is highlighted when the video is play.		
Basic Flow			
Actor Action		**System Response**	
1	The user clicks on the play the button	2	The system paly the video and highlighted the text as well.

3.2 Architecture Diagram

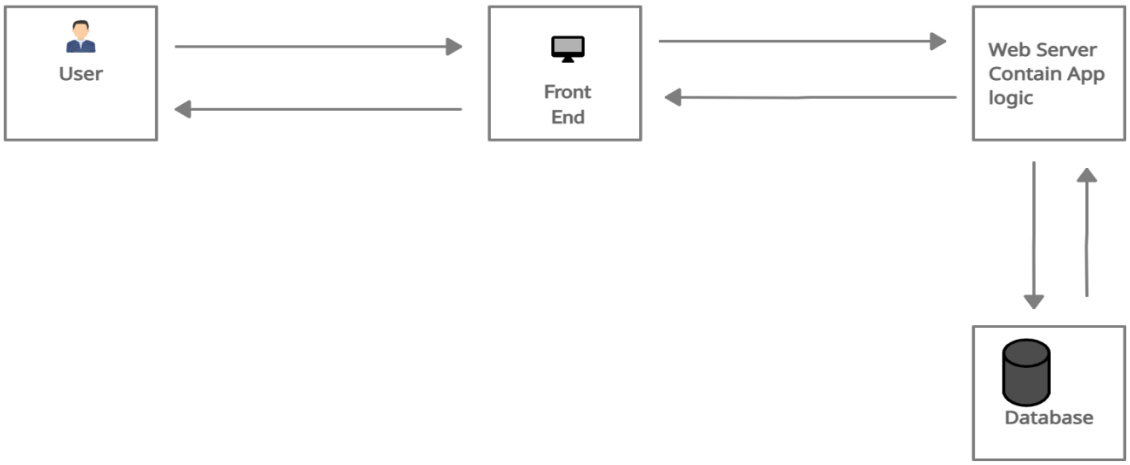


Figure 3.2: Architecture Diagram

3.3 Entity Relationship Diagram

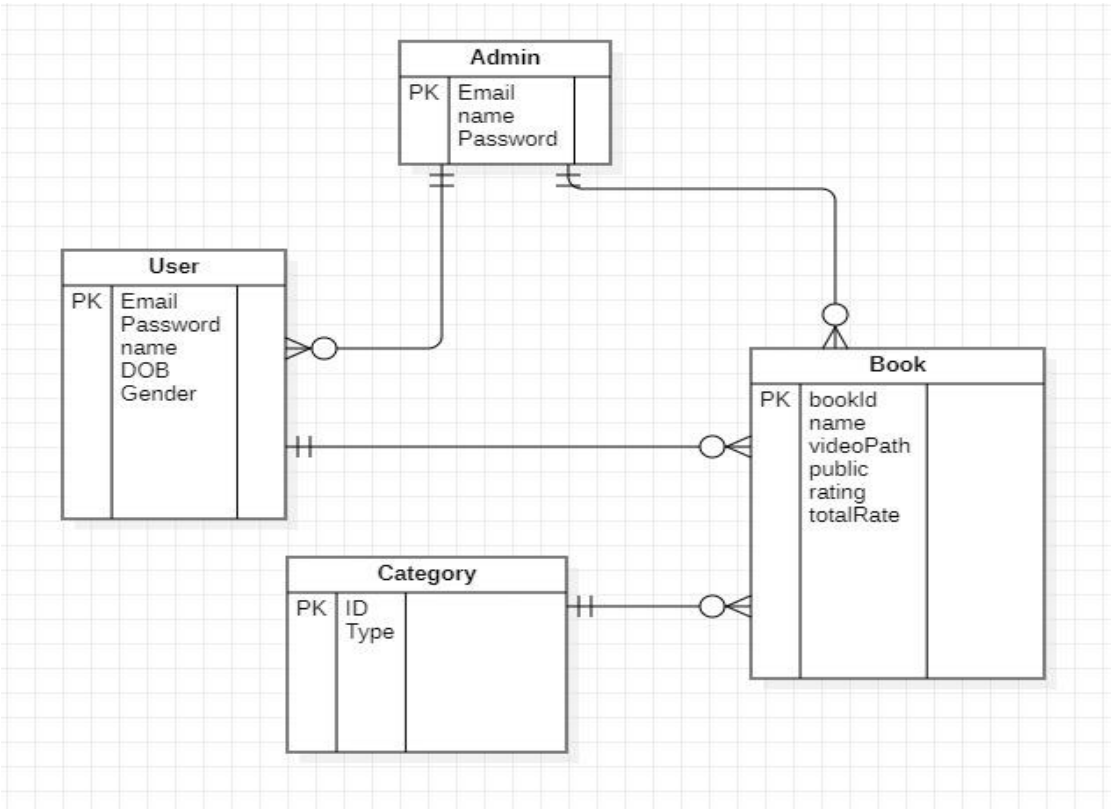


Figure 3.3: Entity Relationship Diagram

3.3.1 Data Dictionary against ERD

Entity	Attribute	Data Type	Nullable	Relation To	Relation Type
User	Email	Varchar	No		
	Password	Varchar	No		
	Name	Varchar	Yes		
	DOB	Date	Yes		
	Gender	Char	No		
Book	bookId	Int	No		
	Name	Varchar	No		
	videoPath	Varchar	No		
	public	Boolean	No		
	Rating	float	Yes		
	totalRate	Int	Yes		
	categoryID	Int	No	Category	1 to *
	userId	Int	No	User	1 to *
Category	Id	int	No		
	Type	Varchar	No		
Admin	Name	Varchar	No		
	Email	Varchar	No		
	Password	Varchar	No		

Table 3.3.1: Data Dictionary against ERD

3.3.2 Logical Schema against ERD

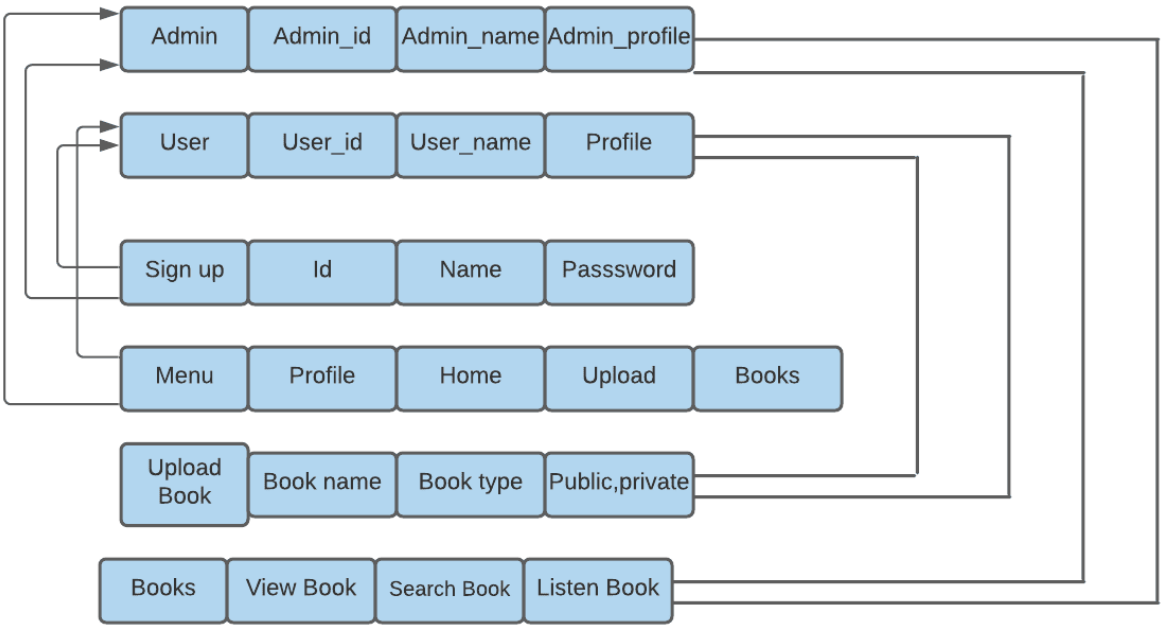


Figure 1.2.3: Logical Schema against ERD

3.4 Data Flow Diagram

3.4.1 Level 0

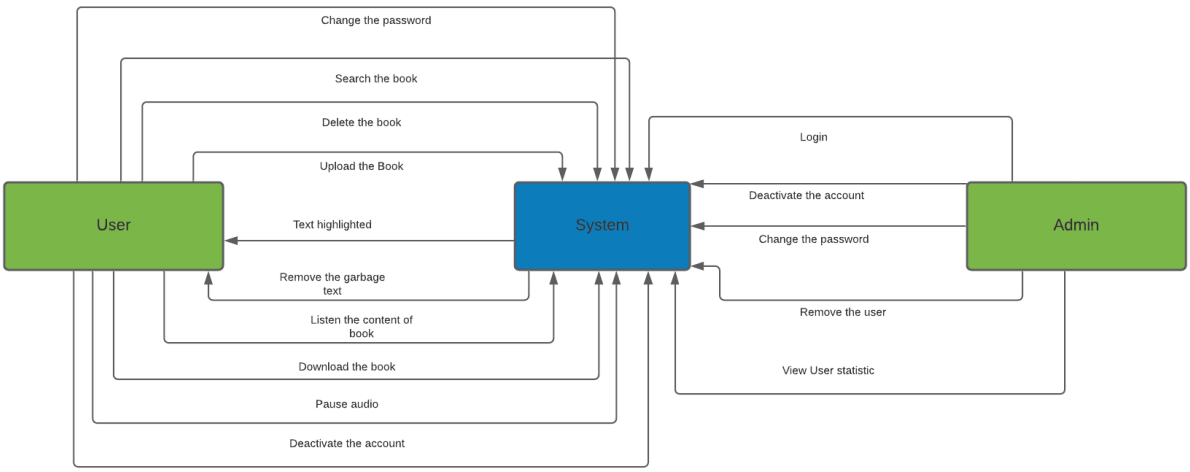


Figure 3.4.1: Data Flow Diagram Level 0

3.4.2 Level 1

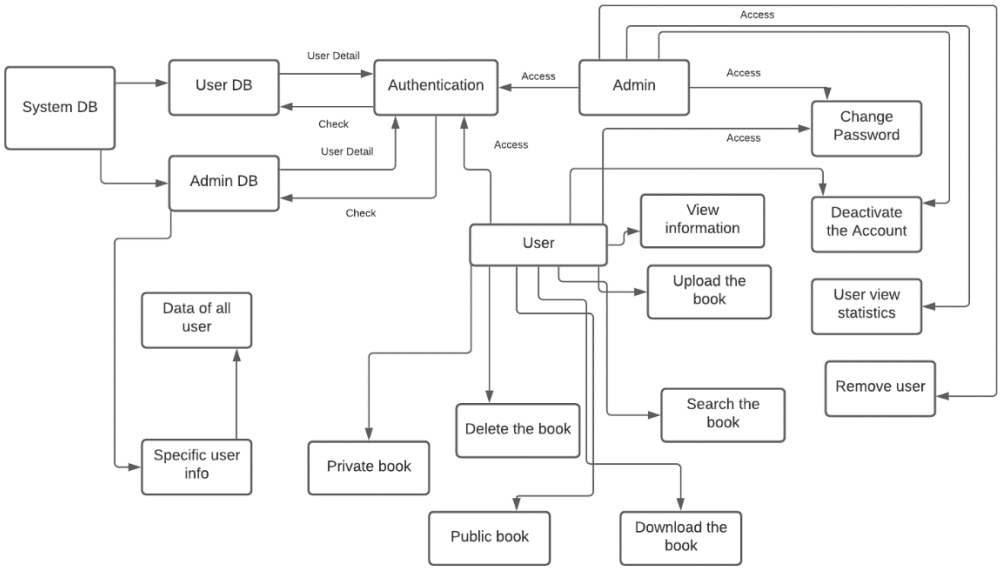


Figure 3.4.2: Data Flow Diagram Level 1

3.5 Class Diagram

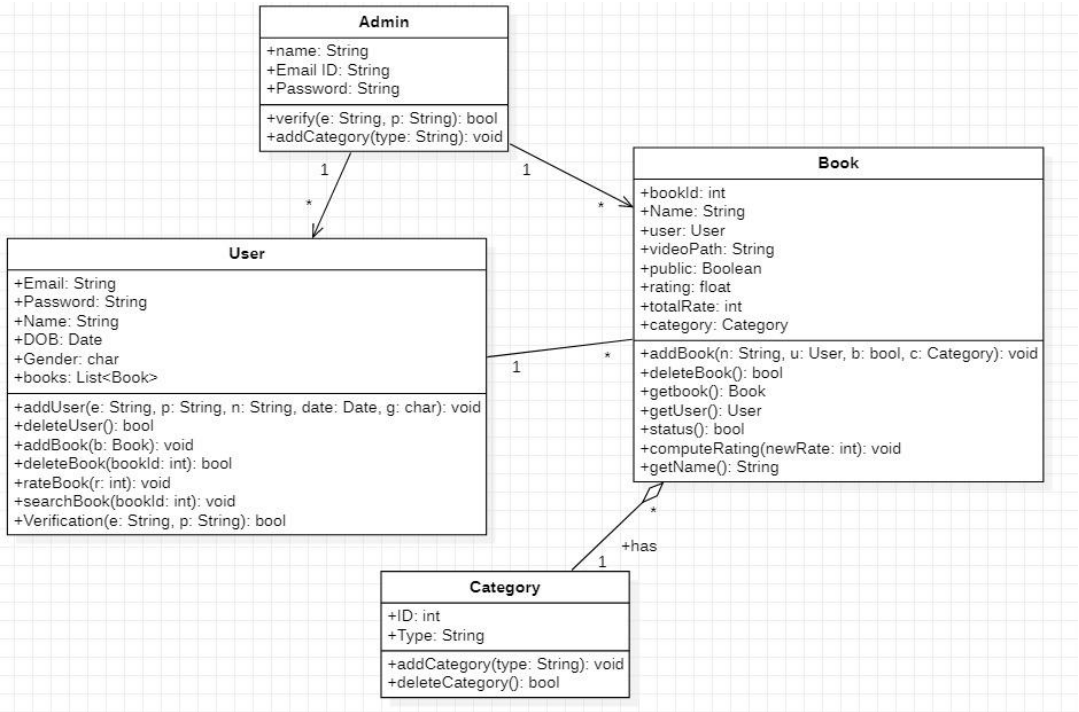


Figure 3.5: Class Diagram

3.6 Activity Diagram

3.6.1 Admin

3.6.1.1 Admin Login

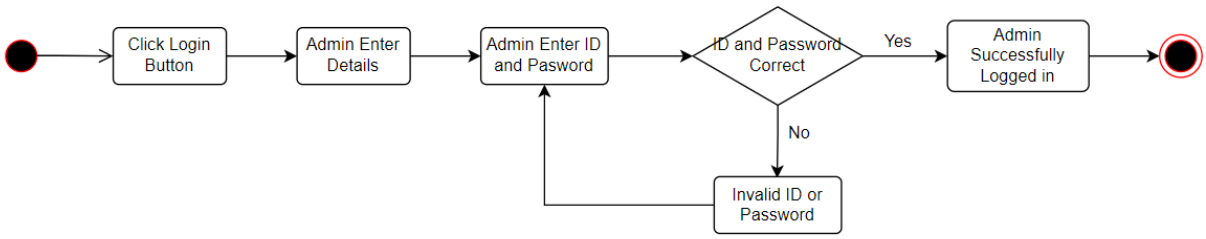


Figure 3.6.1.1: Activity Diagram # 1, Admin Login

3.6.1.2 Admin Logout

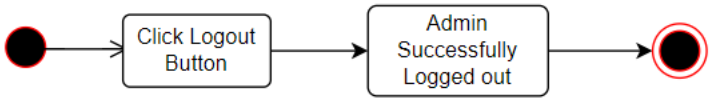


Figure 3.6.1.2: Activity Diagram # 2, Admin Logout

3.6.1.3 Admin Deactivate Account

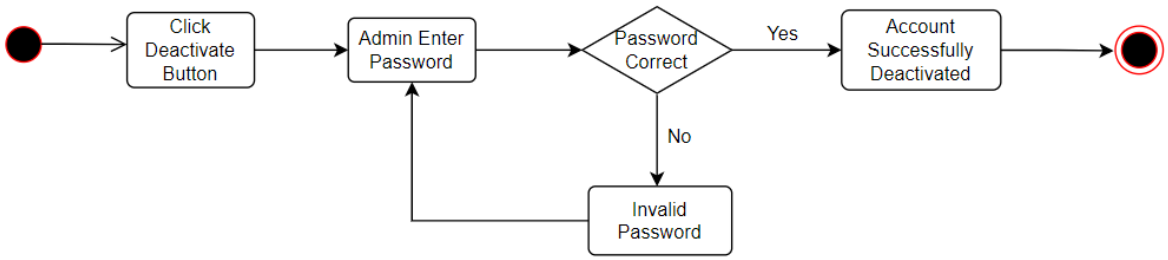


Figure 3.6.1.3: Activity Diagram # 3, Admin Deactivate Account

3.6.1.4 Admin Remove User

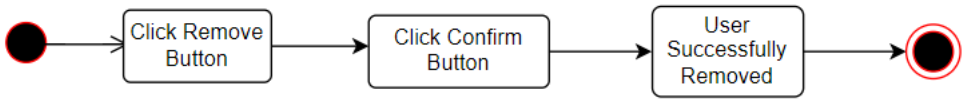


Figure 3.6.1.4: Activity Diagram # 4, Admin Remove User

3.6.1.5 Admin Change Password

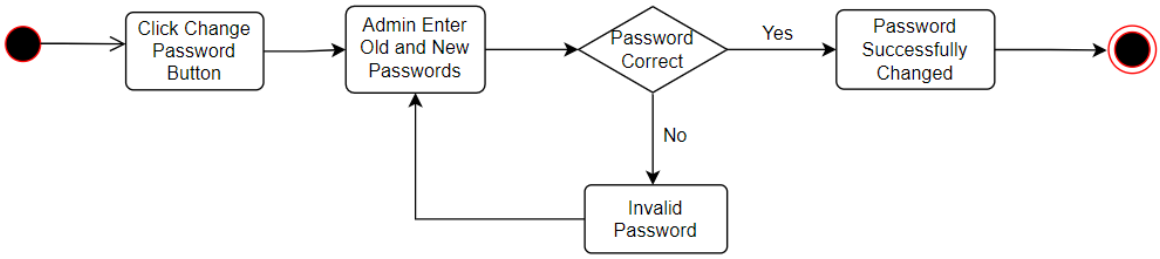


Figure 3.6.1.5: Activity Diagram # 5, Admin Change Password

3.6.1.6 Admin View User's Statistics

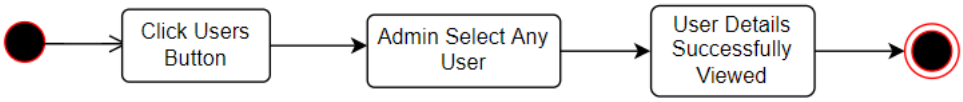


Figure 3.6.1.6: Activity Diagram # 6, Admin View User's Statistics

3.6.2 User

3.6.2.1 User Sign Up

Figure 2.6.2.1: Activity Diagram # 7, User Sign Up

3.6.2.2 User Login

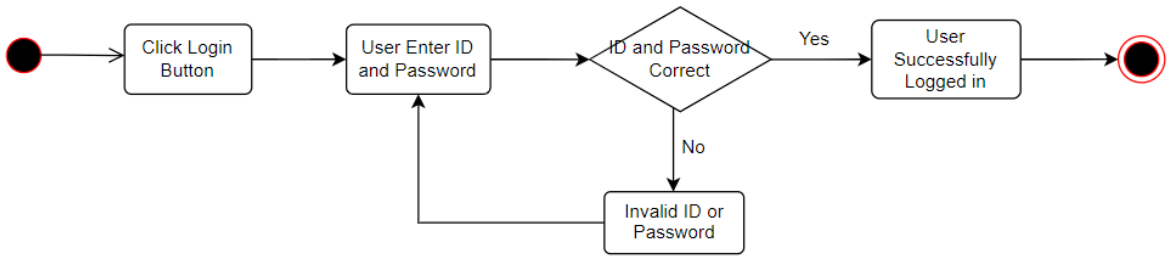


Figure 3.6.2.2: Activity Diagram # 8, User Login

3.6.2.3 User Logout

Figure 3.6.2.3: Activity Diagram # 9, User Logout

3.6.2.4 User Upload Book

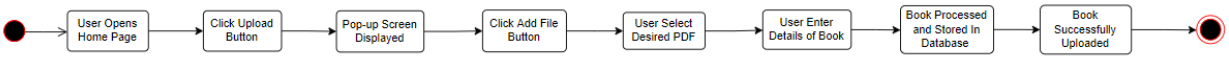


Figure 3.6.2.4: Activity Diagram # 10, User Upload Book

3.6.2.5 User Listen Book

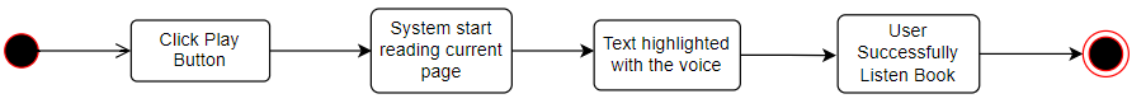


Figure 3.6.2.5: Activity Diagram # 11, User Listen Book

3.6.2.6 User Delete Book

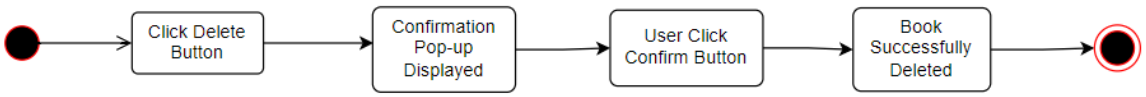


Figure 3.6.2.6: Activity Diagram # 12, User Delete Book

3.6.2.7 User Download Book

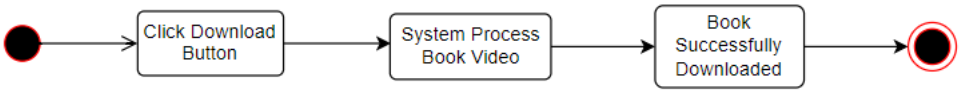


Figure 3.6.2.7: Activity Diagram # 13, User Download Book

3.6.2.8 Remove Garbage Text

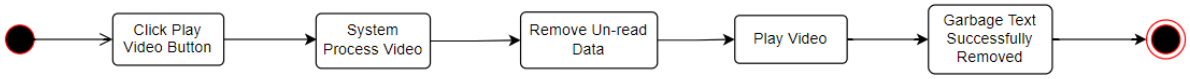


Figure 3.6.2.8: Activity Diagram # 14, Remove Garbage Text

3.6.2.9 User Search Book

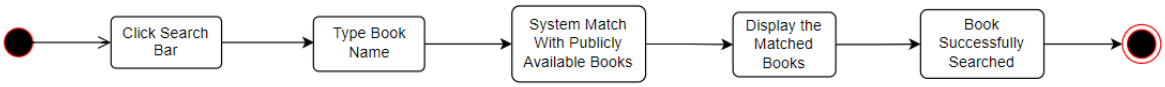


Figure 3.6.2.9: Activity Diagram # 15, User Search Book

3.6.2.10 User Pause Audio

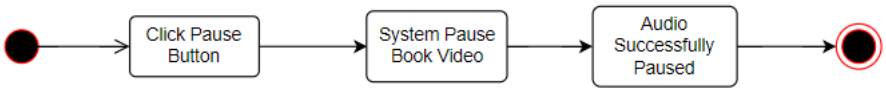


Figure 3.6.2.10: Activity Diagram # 16, User Pause Audio

3.6.2.11 User Restart Audio

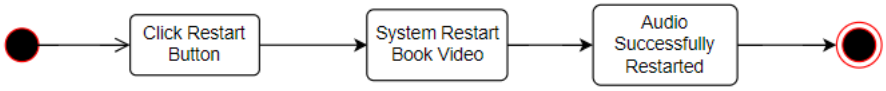


Figure 3.6.2.11: Activity Diagram # 17, User Restart Audio

3.6.2.12 User Rate Book

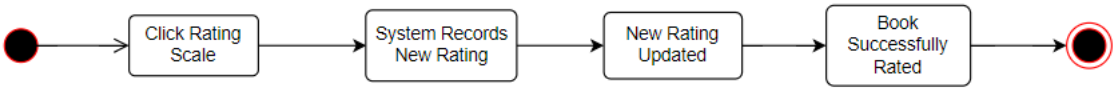


Figure 3.6.2.12: Activity Diagram # 18, User Rate Book

3.6.2.13 User Deactivate Account

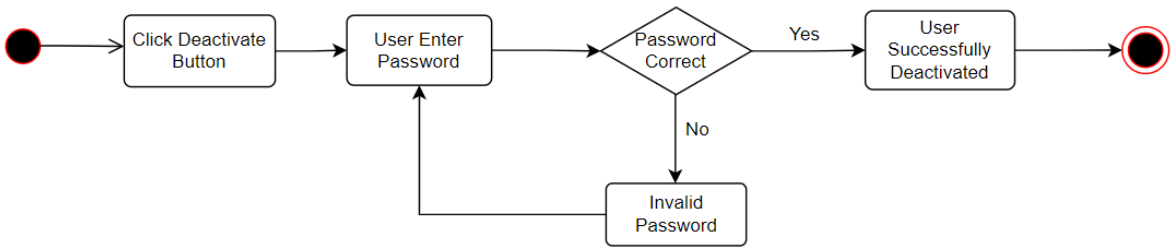


Figure 3.6.2.13: Activity Diagram # 19, User Deactivate Account

3.6.2.14 User Change Password

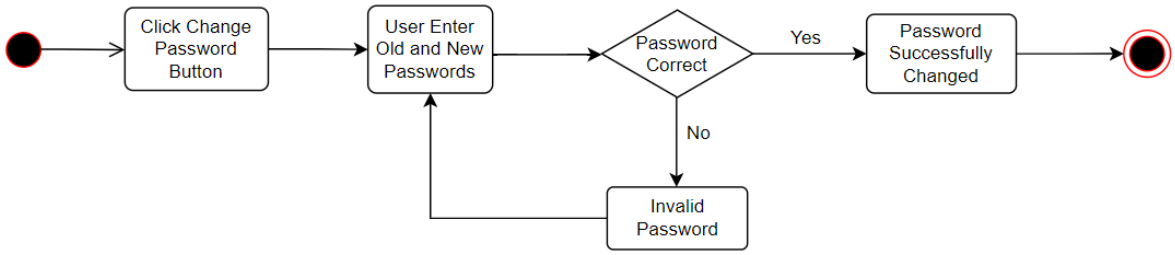


Figure 3.6.2.14: Activity Diagram # 20, User Change Password

3.6.2.15 User View Account Information

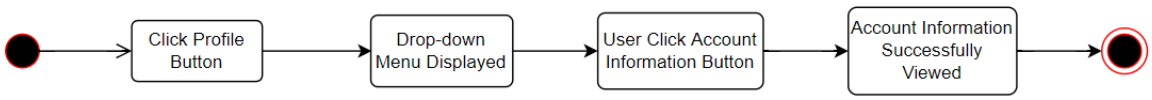


Figure 3.6.2.15: Activity Diagram # 21, User View Account Information

3.6.2.16 Highlight Text

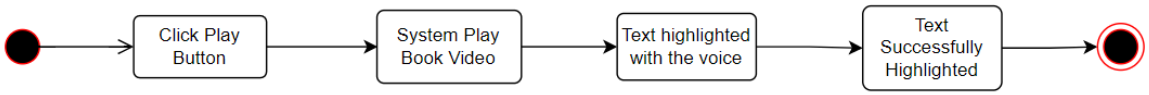


Figure 3.6.2.16: Activity Diagram # 22, Highlight Text

3.6.2.17 User Make Book Public

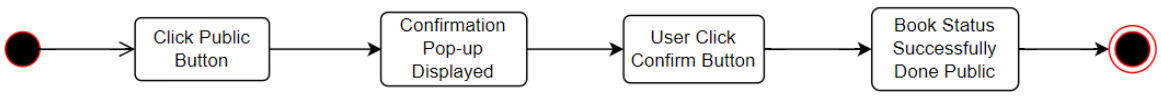


Figure 4.6.2.17: Activity Diagram # 23, User Make Book Public

3.6.2.18 User Make Book Private

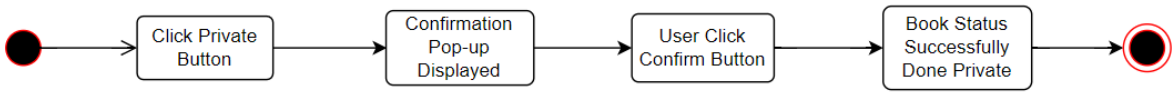


Figure 5.6.2.18: Activity Diagram # 24, User Make Book Private

3.6.3 Aggregated Activity Diagram

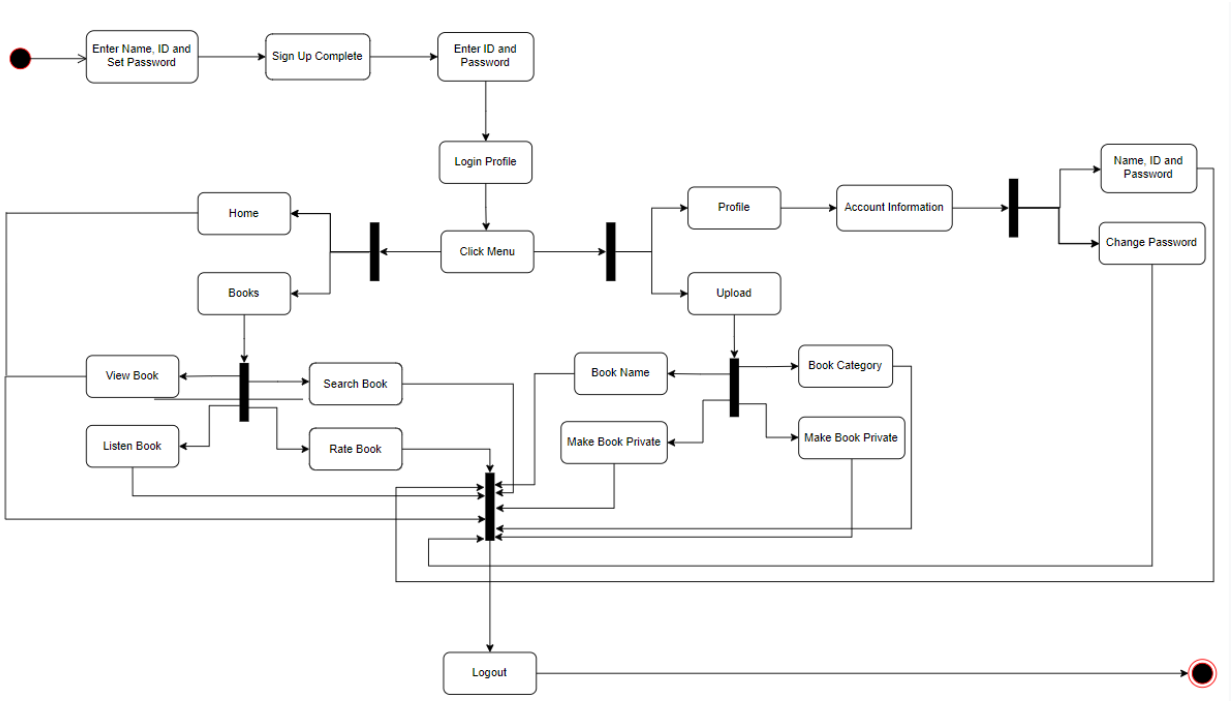


Figure 6.6.3: Aggregated Activity Diagram

3.7 Sequence Diagram

3.7.1 Admin

3.7.1.1 Admin Login

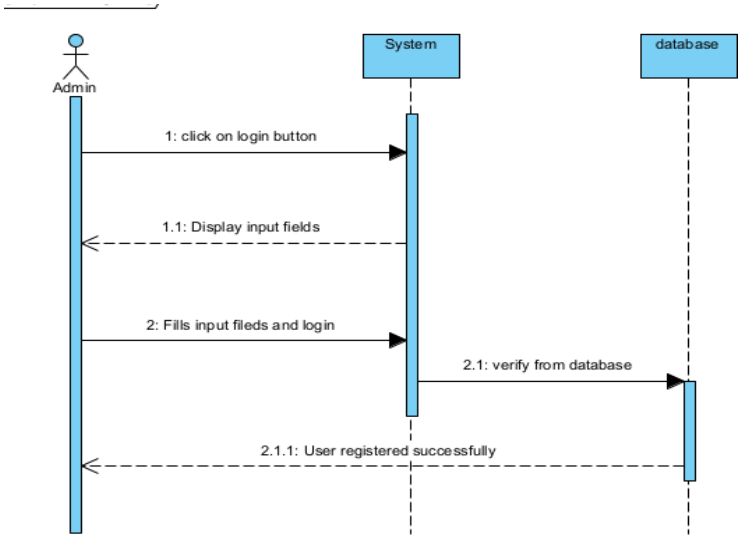


Figure 7.7.1.1: Sequence Diagram # 1, Admin Login

3.7.1.2 Admin Logout

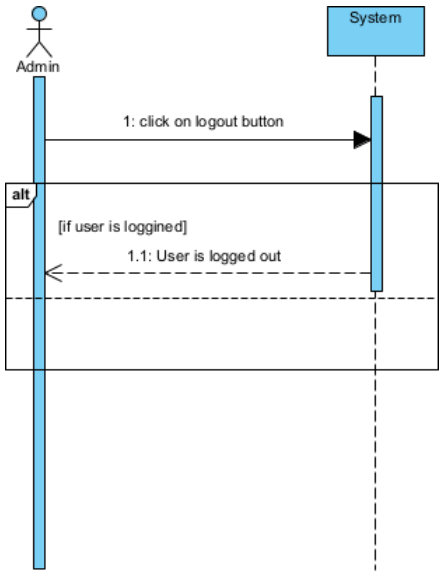


Figure 8.7.1.2: Sequence Diagram # 2, Admin Logout

3.7.1.3 Admin Deactivate Account

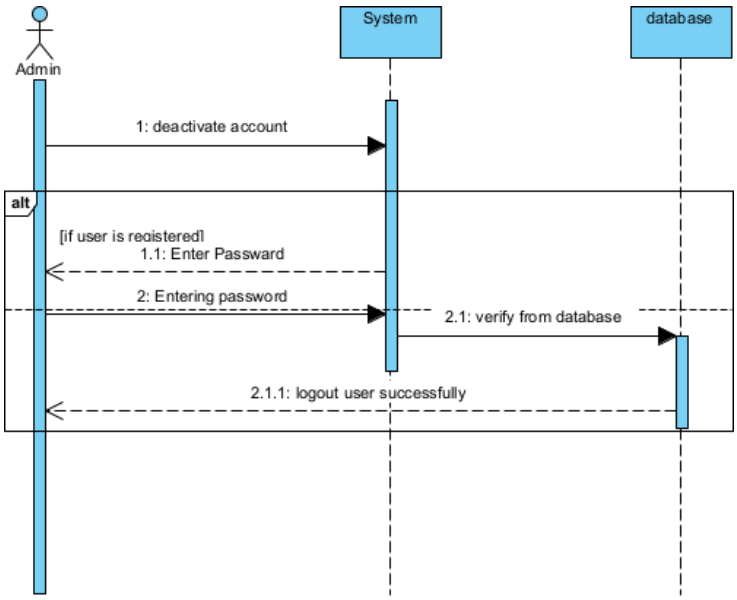


Figure 9.7.1.3: Sequence Diagram # 3, Admin Deactivate Account

3.7.1.4 Admin Remove User

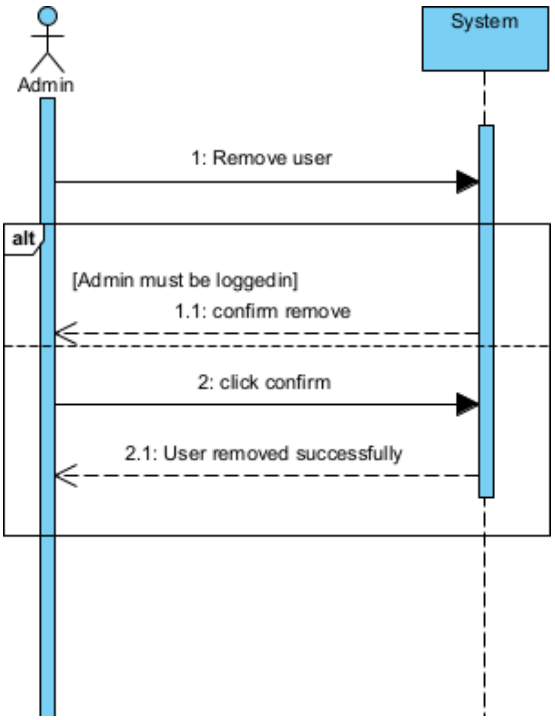


Figure 3.7.1.4: Sequence Diagram # 4, Admin Remove User

3.7.1.5 Admin Change Password

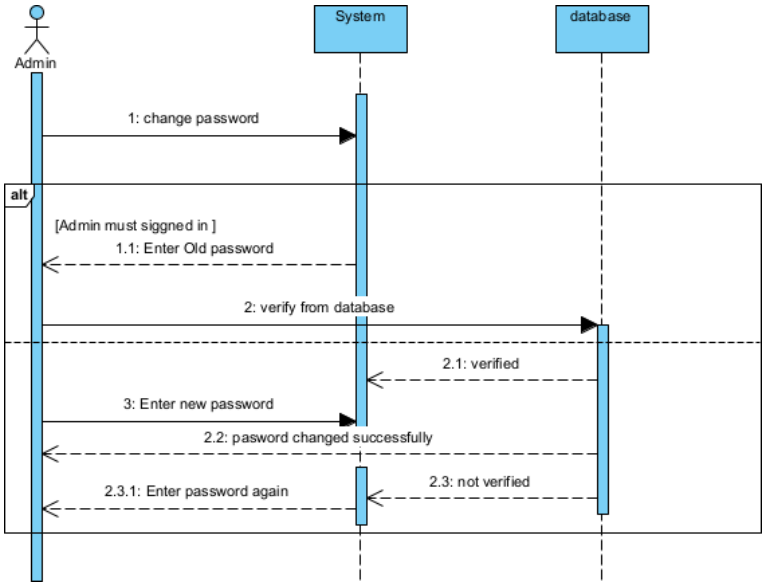


Figure 3.7.1.5: Sequence Diagram # 5, Admin Change Password

3.7.1.6 Admin View User's Statistics

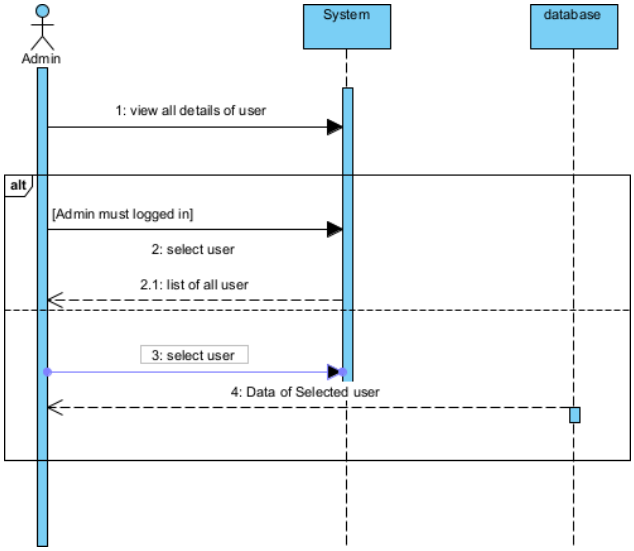


Figure 3.7.1.6: Sequence Diagram # 6, Admin View User's Statistics

3.7.2 User

3.7.2.1 User Sign Up

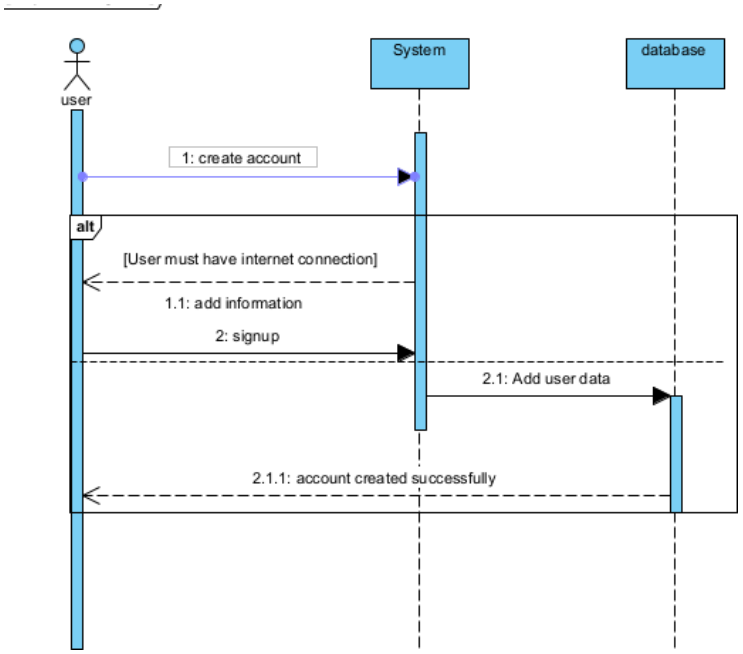


Figure 10.7.2.1: Sequence Diagram # 7, User Sign Up

3.7.2.2 User Login

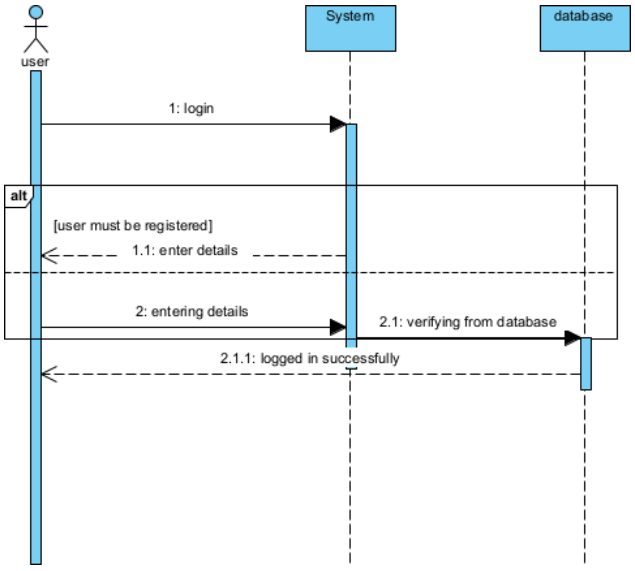


Figure 3.7.2.2: Sequence Diagram # 8, User Login

3.7.2.3 User Logout

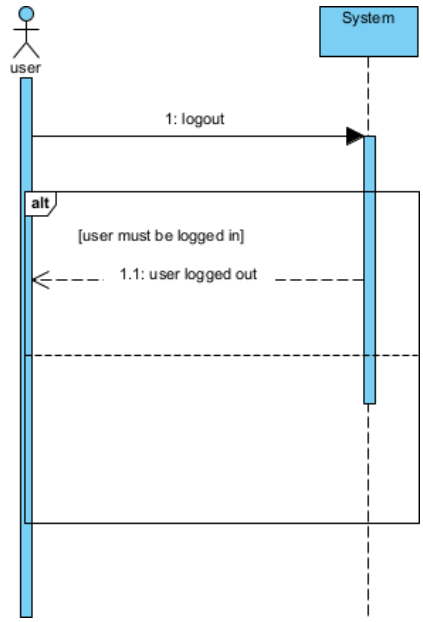


Figure 3.7.2.3: Sequence Diagram # 9, User Logout

3.7.2.4 User Upload Book

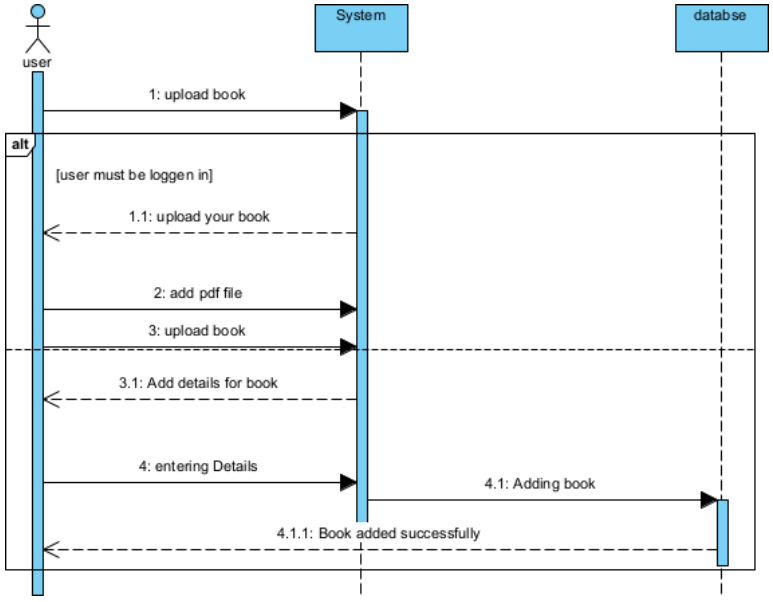


Figure 3.7.2.4: Sequence Diagram # 10, User Upload Book

3.7.2.5 User Listen Book

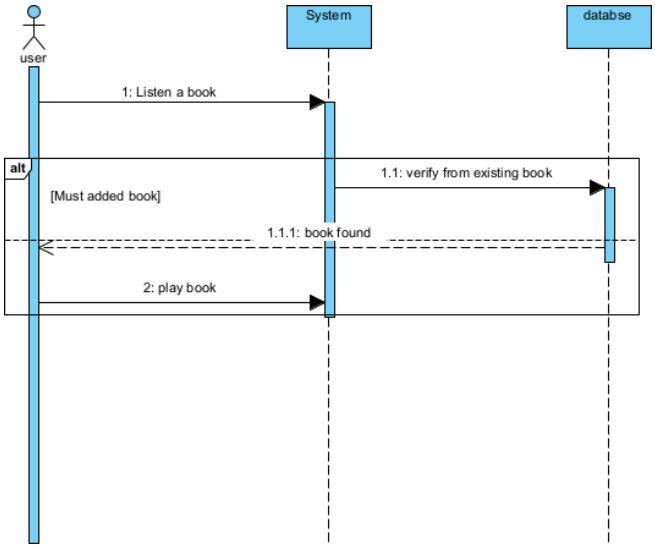


Figure 3.7.2.5: Sequence Diagram # 11, User Listen Book

3.7.2.6 User Delete Book

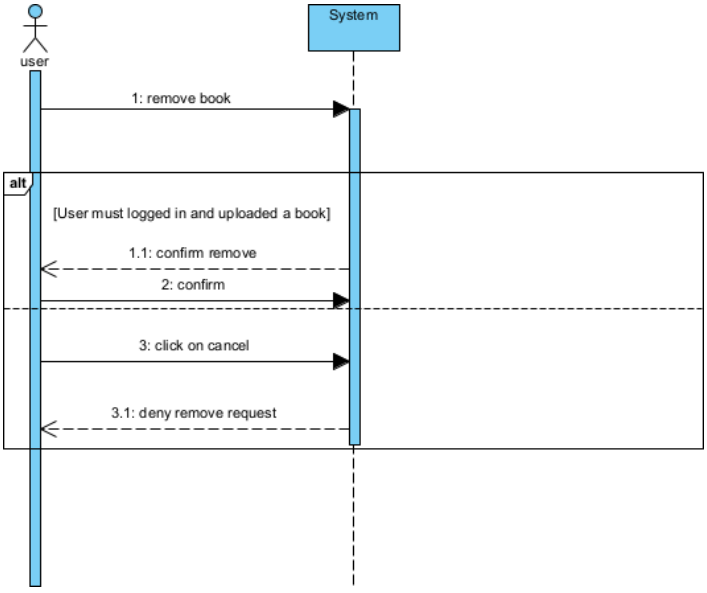


Figure 3.7.2.6: Sequence Diagram # 12, User Delete Book

3.7.2.7 User Download Book

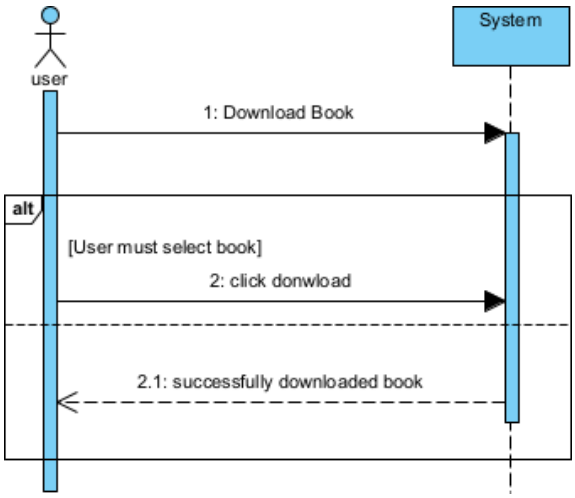


Figure 3.7.2.7: Sequence Diagram # 13, User Download Book

3.7.2.8 Remove Garbage Text

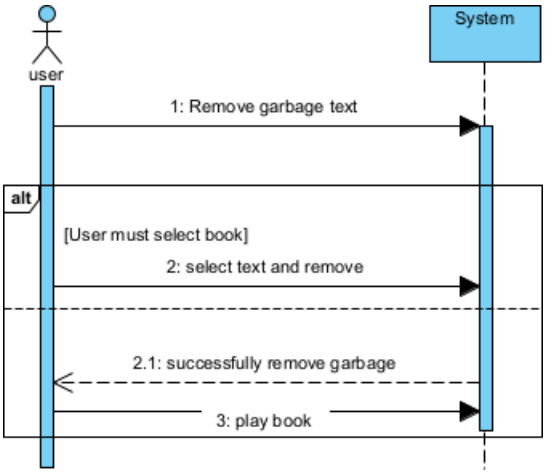


Figure 3.7.2.8: Sequence Diagram # 14, Remove Garbage Text

3.7.2.9 User Search Book

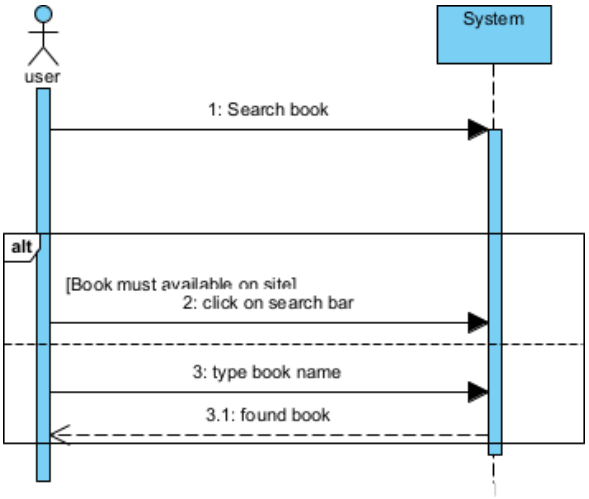


Figure 3.7.2.9: Sequence Diagram # 15, User Search Book

3.7.2.10 User Pause Audio

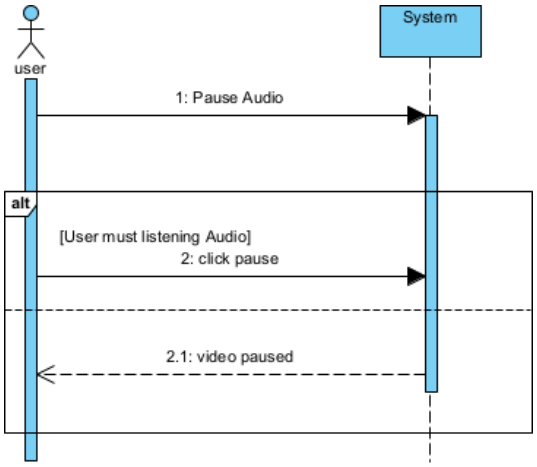


Figure 3.7.2.10: Sequence Diagram # 16, User Pause Audio

3.7.2.11 User Restart Audio

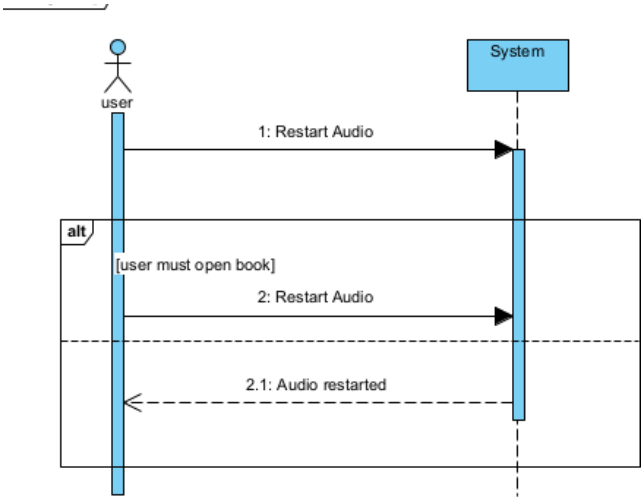


Figure 3.7.2.11: Sequence Diagram # 17, User Restart Audio

3.7.2.12 User Rate Book

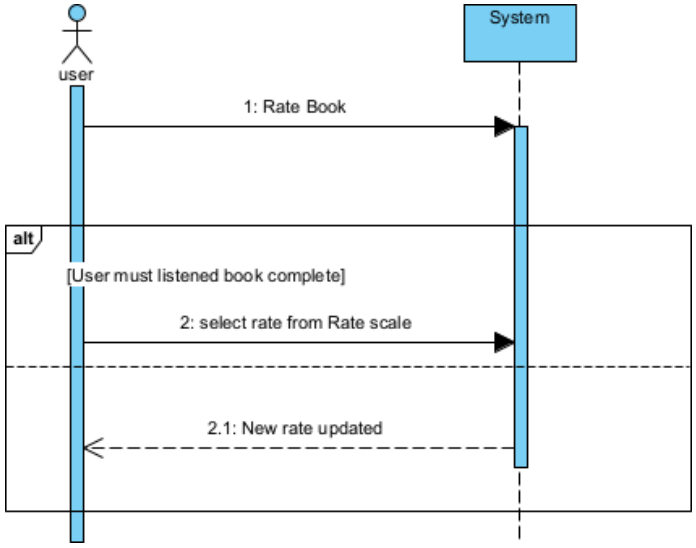


Figure 3.7.2.12: Sequence Diagram # 18, User Rate Book

3.7.2.13 User Deactivate Account

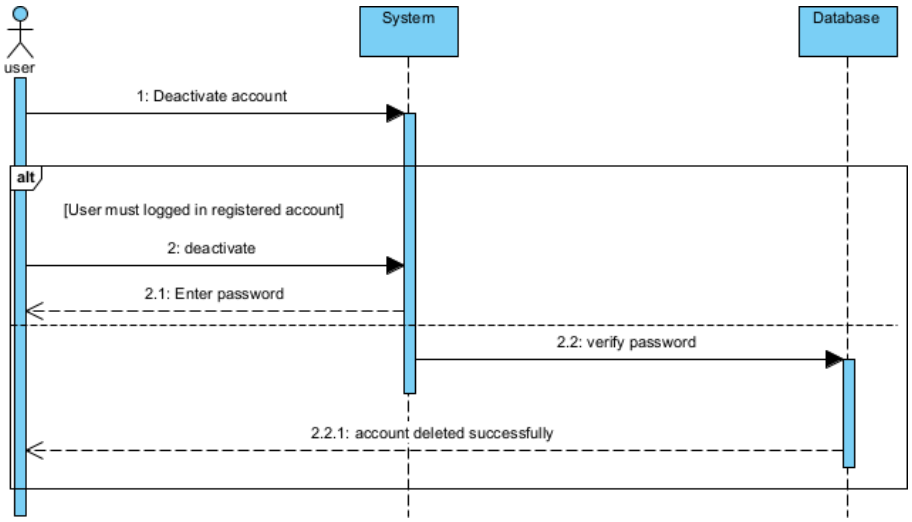


Figure 3.7.2.13: Sequence Diagram # 19, User Deactivate Account

3.7.2.14 User Change Password

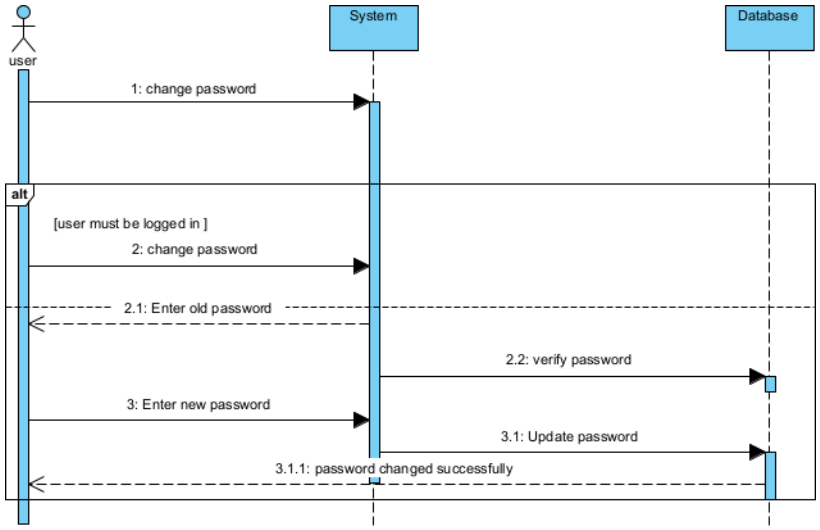


Figure 3.7.2.14: Sequence Diagram # 20, User Change Password

3.7.2.15 User View Account Information

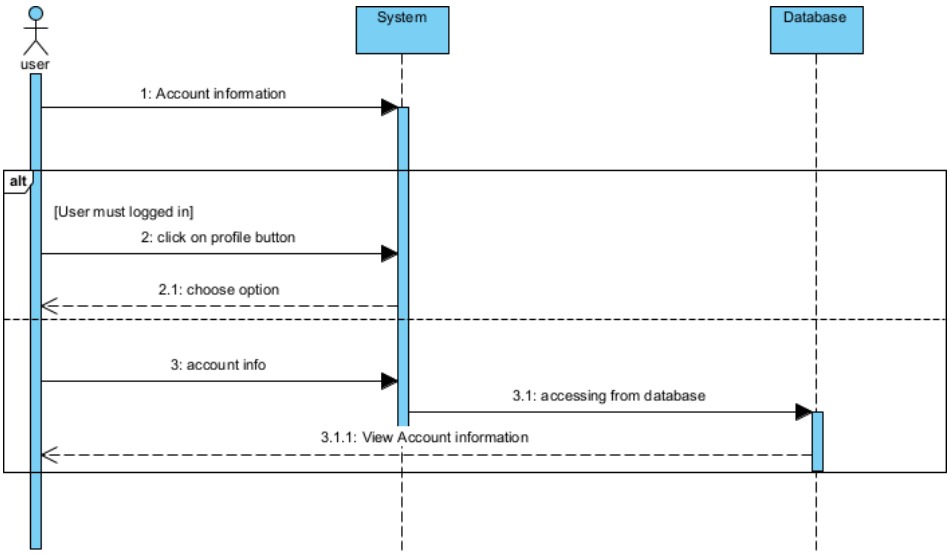


Figure 3.7.2.15: Sequence Diagram # 21, User View Account Information

3.7.2.16 Highlight Text

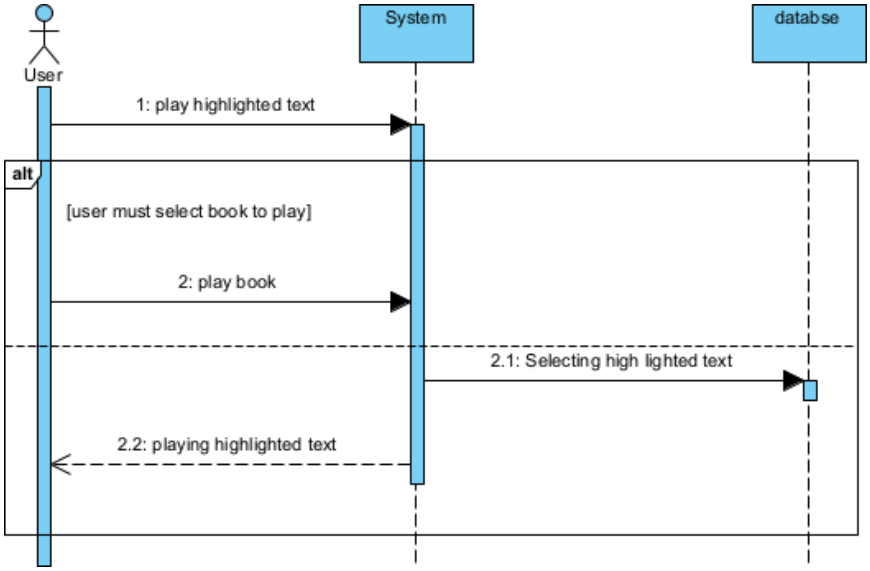


Figure 3.7.2.16: Sequence Diagram # 22, Highlight Text

3.7.2.17 User Make Book Public

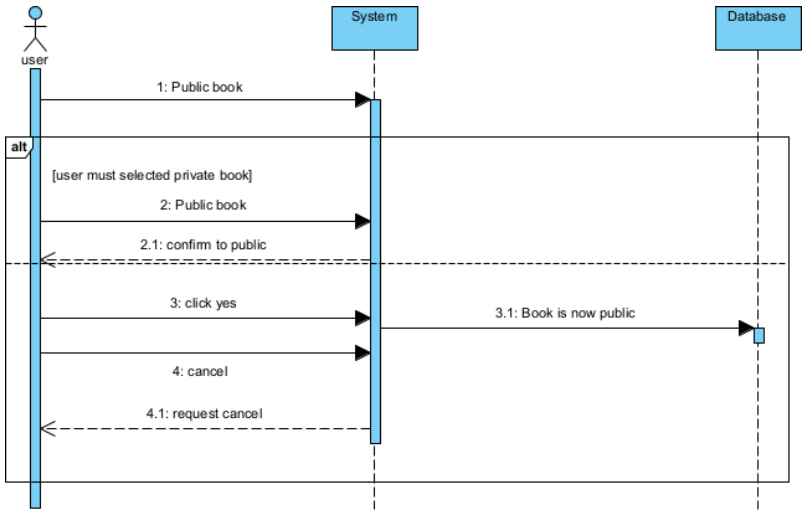


Figure 3.7.2.17: Sequence Diagram # 23, User Make Book Public

3.7.2.18 User Make Book Private

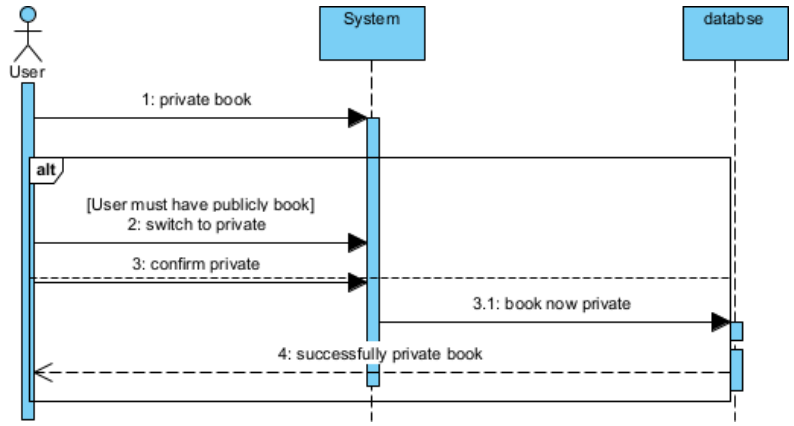


Figure 3.7.2.18: Sequence Diagram # 24, User Make Book Private

3.7.3 Aggregated Sequence Diagram

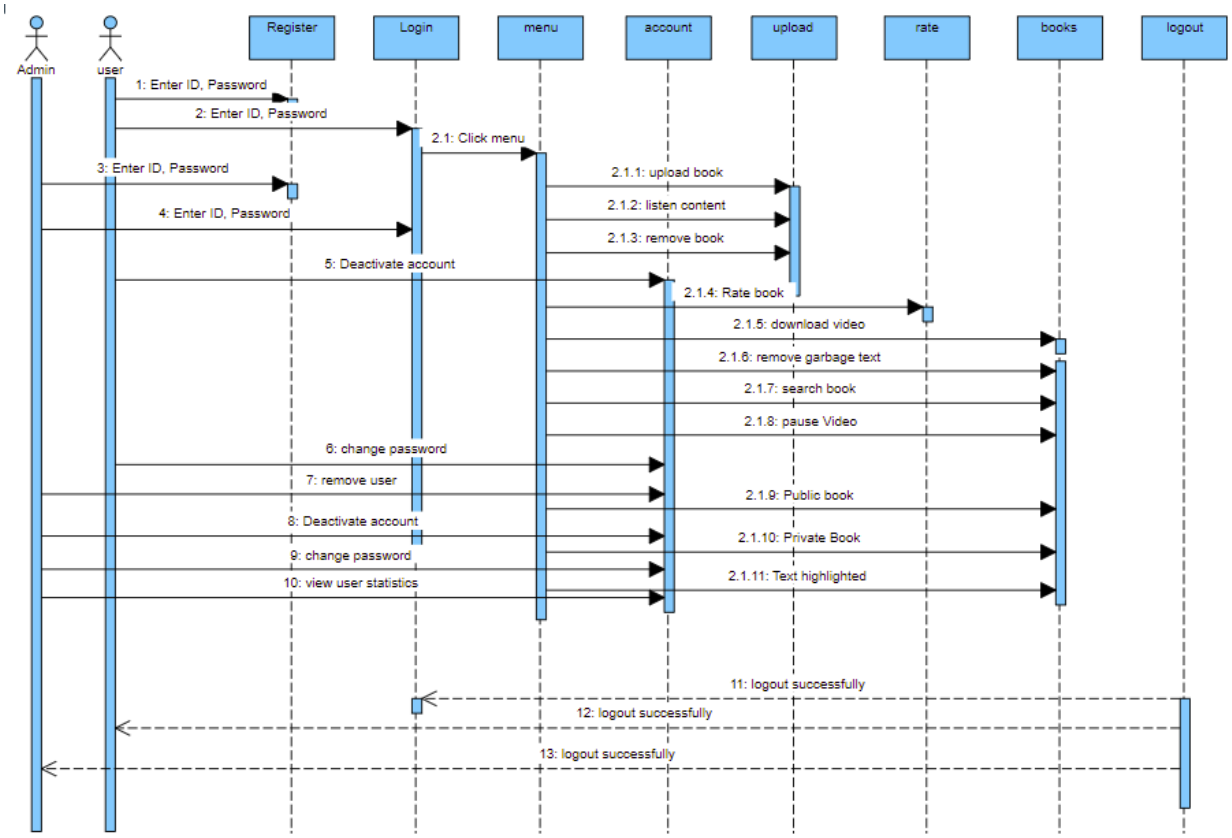


Figure 3.7.3: Aggregated Sequence Diagram

3.8 Collaboration Diagram

3.8.1 Admin

3.8.1.1 Admin Login

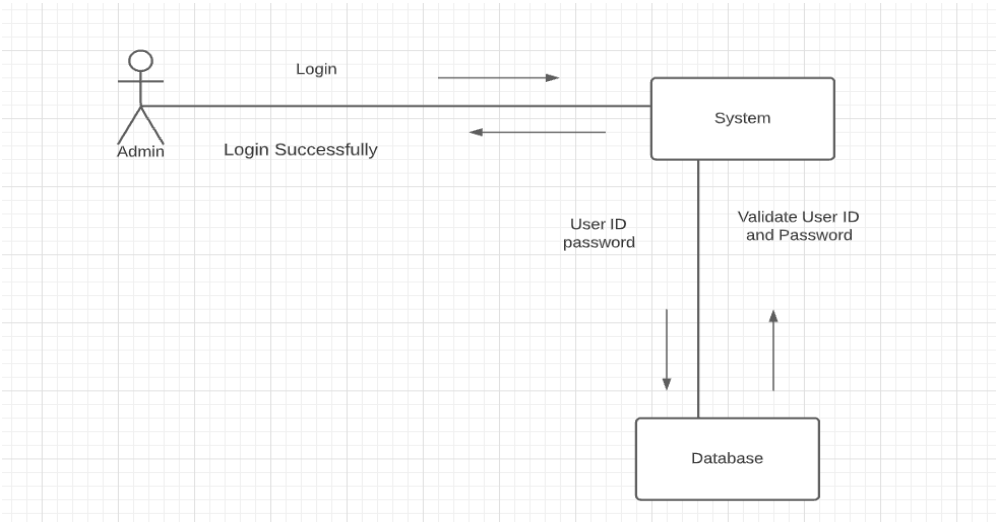


Figure 3.8.1.1: Collaboration Diagram # 1, Admin Login

3.8.1.2 Admin Logout

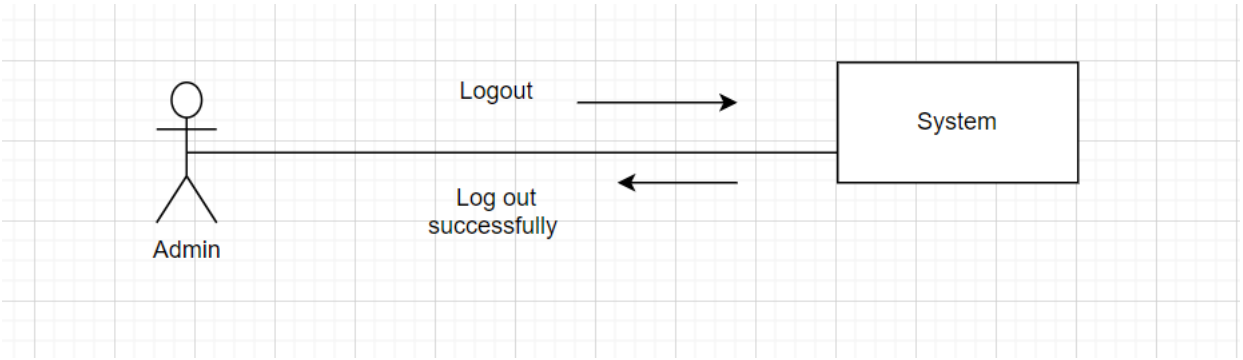


Figure 3.8.1.2: Collaboration Diagram # 2, Admin Logout

3.8.1.3 Admin Deactivate Account

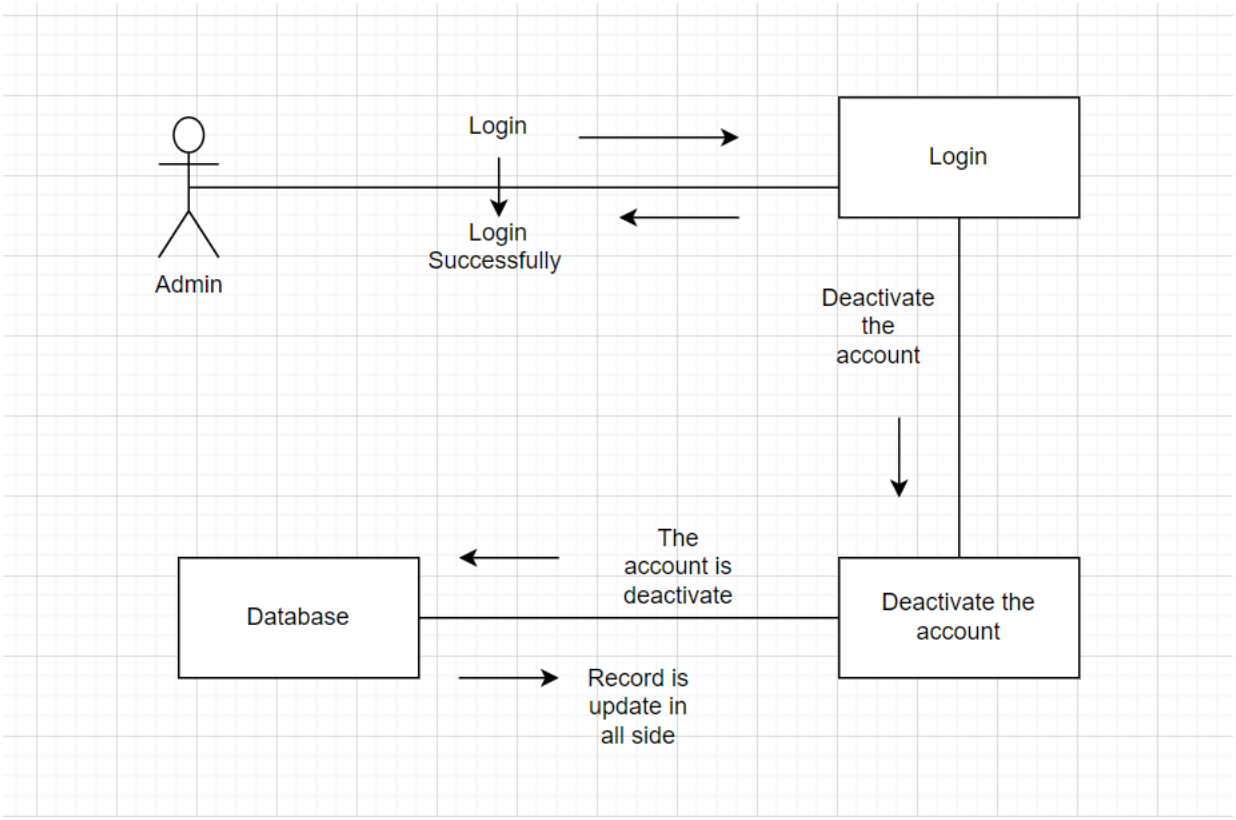


Figure 3.8.1.3: Collaboration Diagram # 3, Admin Deactivate Account

3.8.1.4 Admin Remove User

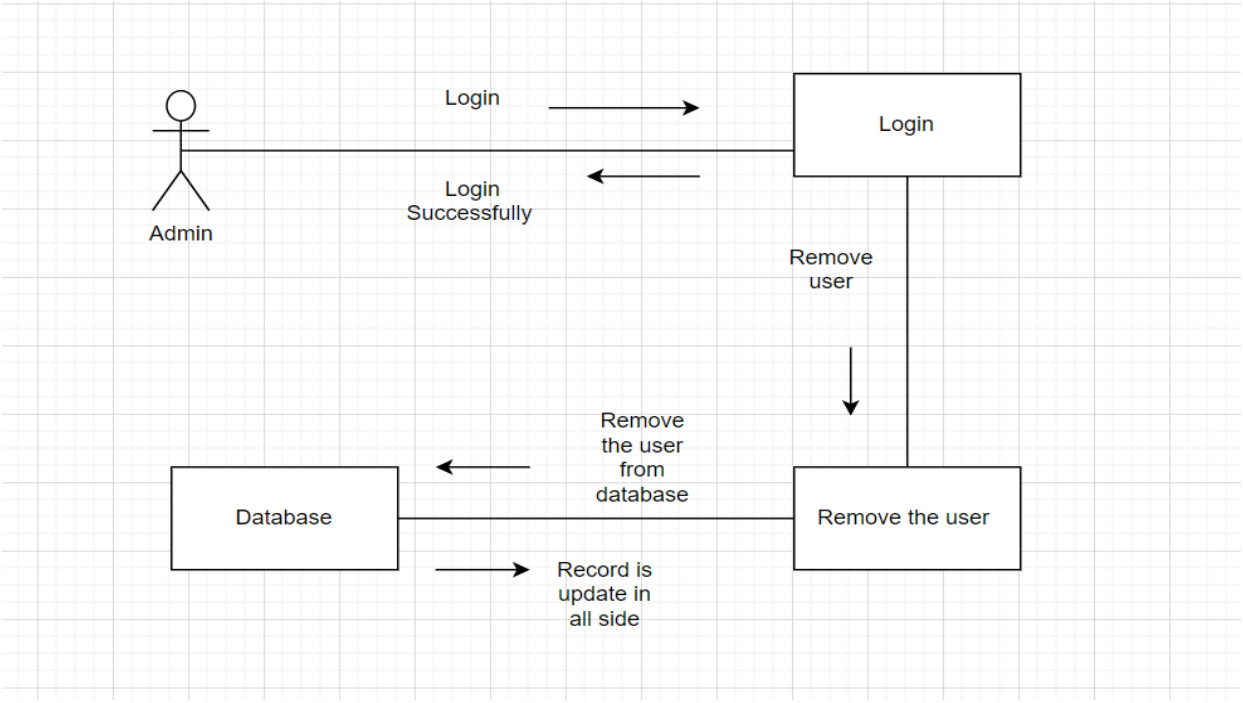


Figure 3.8.1.4: Collaboration Diagram # 4, Admin Remove User

3.8.1.5 Admin Change Password

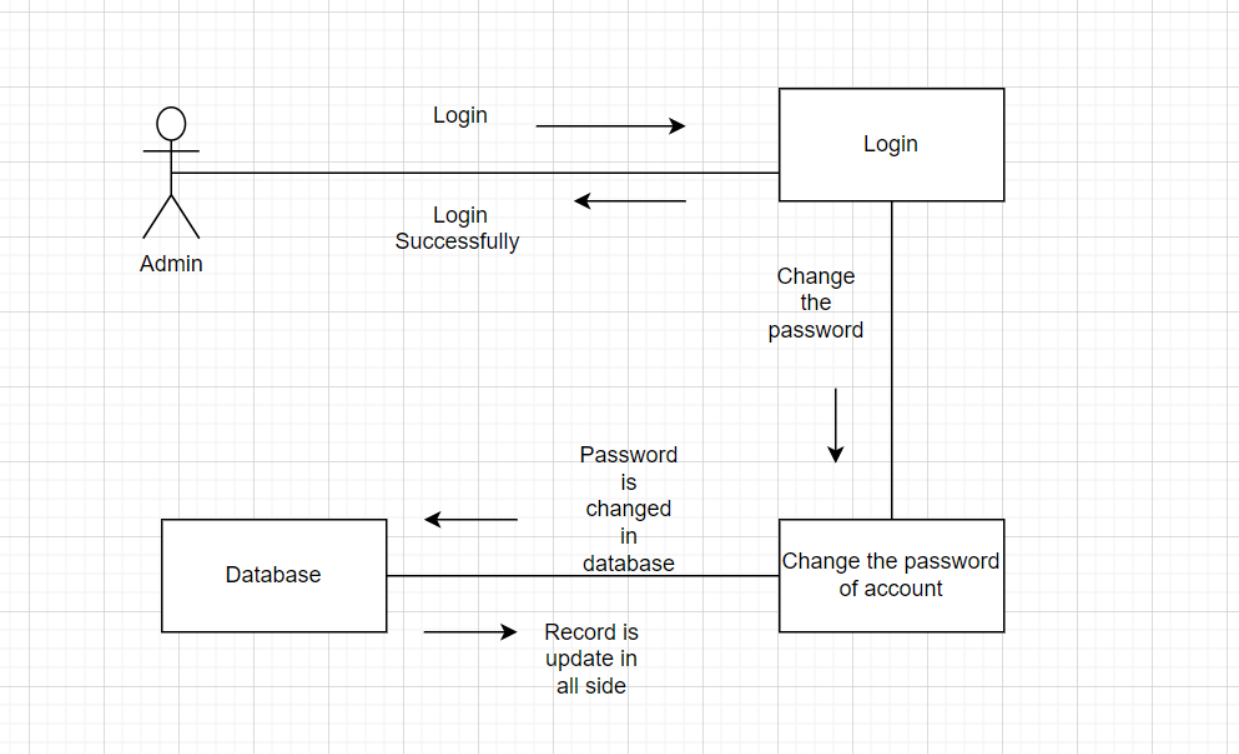


Figure 3.8.1.5: Collaboration Diagram # 5, Admin Change Password

3.8.1.6 Admin View User's Statistics

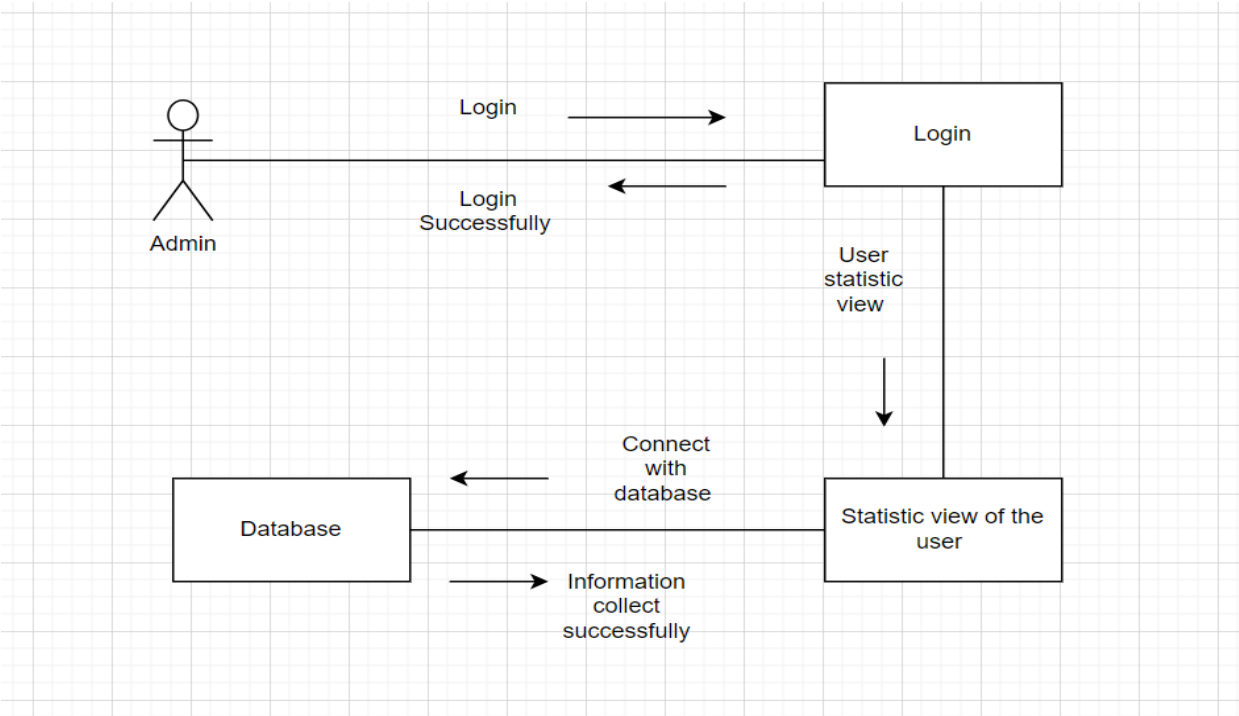


Figure 3.8.1.6: Collaboration Diagram # 6, Admin View User's Statistics

3.8.2 User

3.8.2.1 User Sign Up

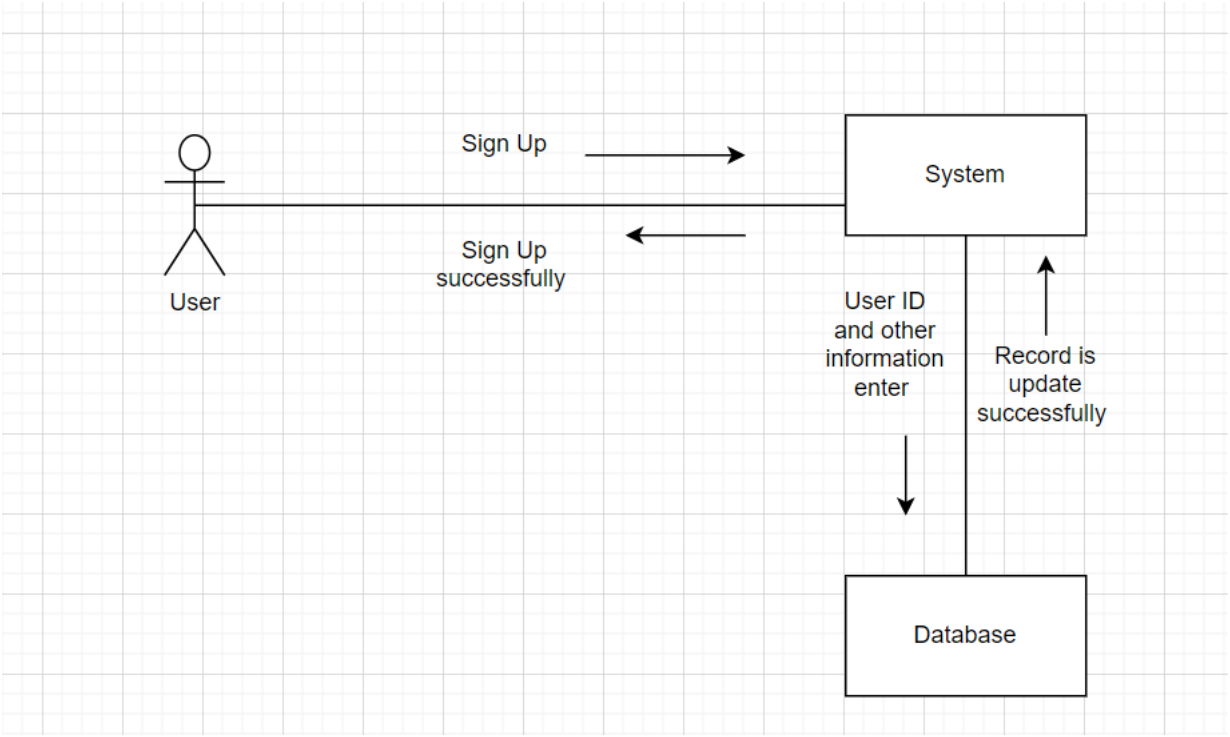


Figure 3.8.2.1: Collaboration Diagram # 7, User Sign Up

3.8.2.2 User Login

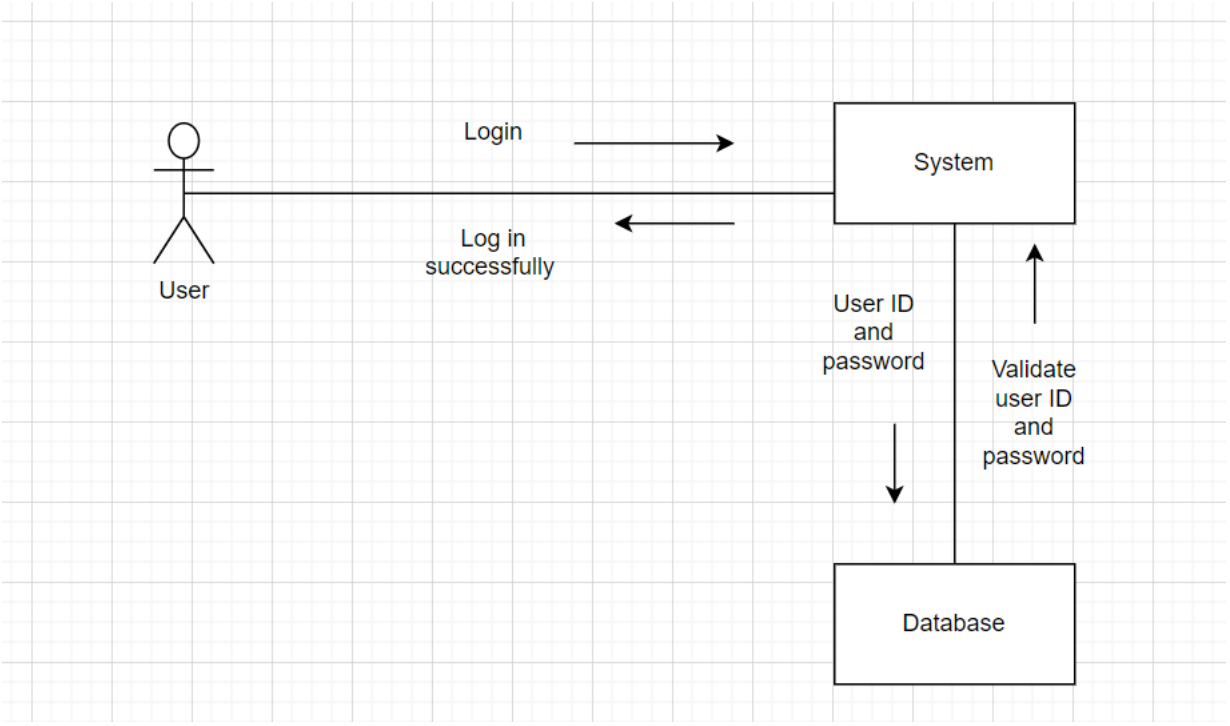


Figure 3.8.2.2: Collaboration Diagram # 8, User Login

3.8.2.3 User Logout

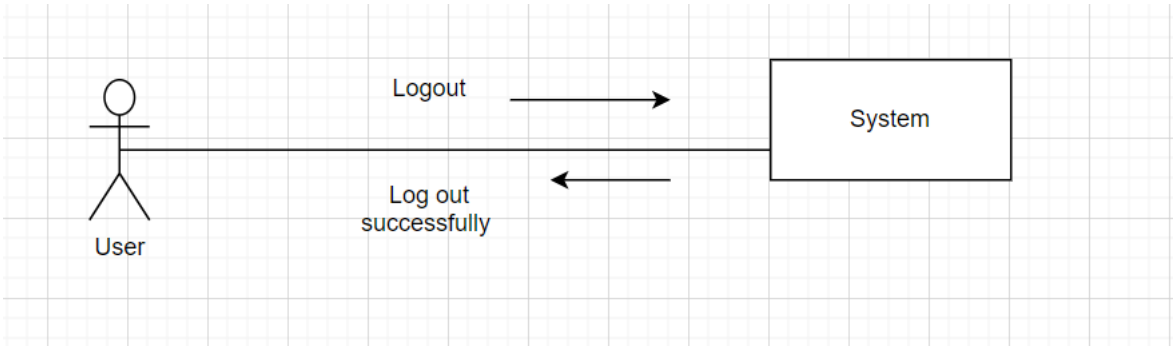


Figure 3.8.2.3: Collaboration Diagram # 9, User Logout

3.8.2.4 User Upload Book

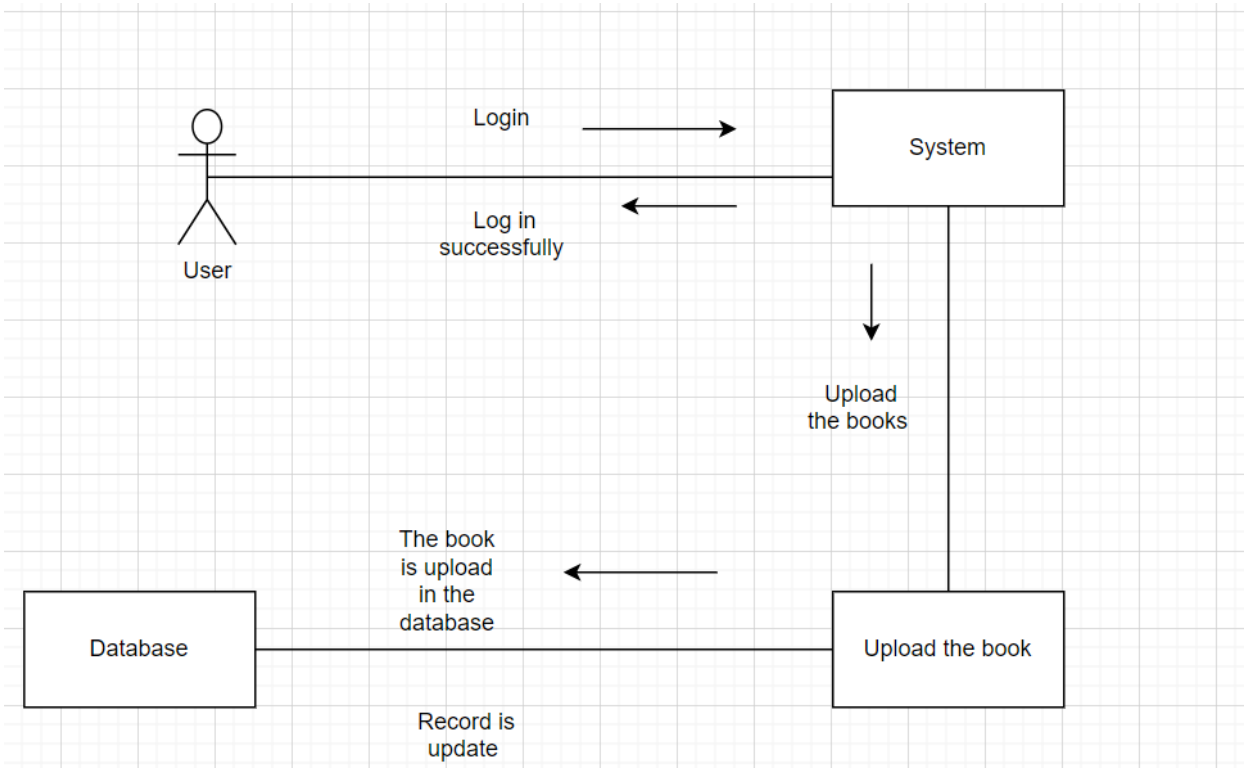


Figure 3.8.2.4: Collaboration Diagram # 10, User Upload Book

3.8.2.5 User Listen Book

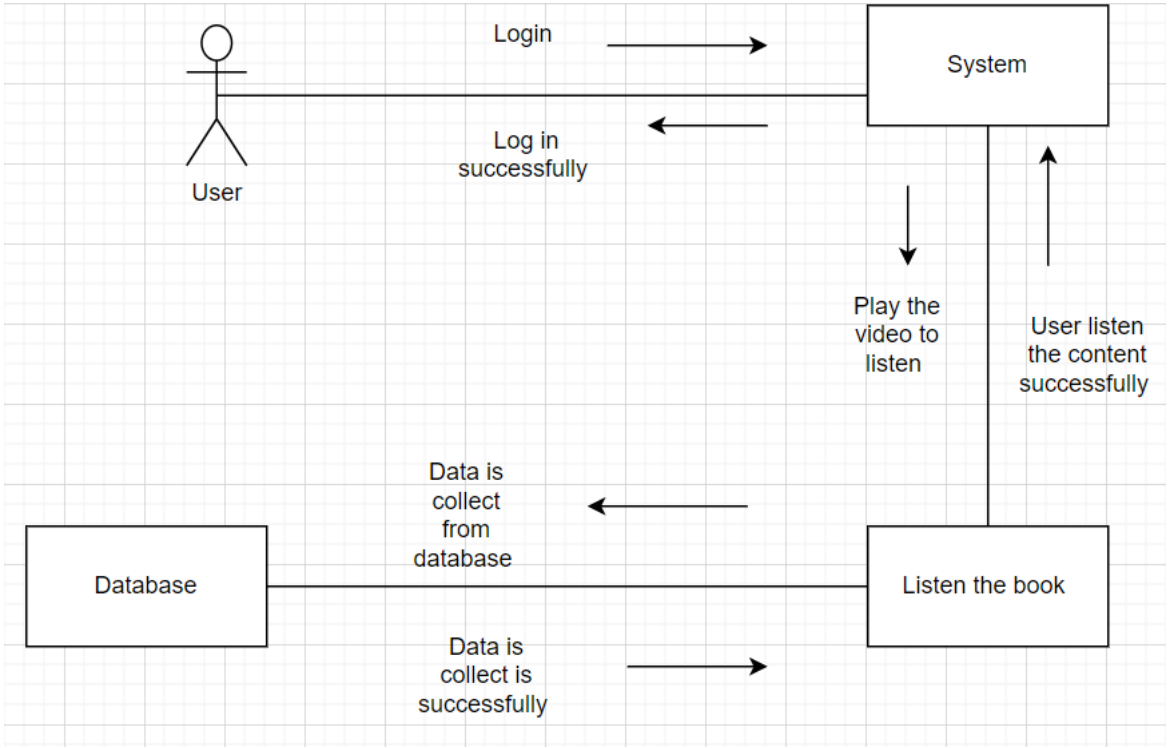


Figure 3.8.2.5: Collaboration Diagram # 11, User Listen Book

3.8.2.6 User Delete Book

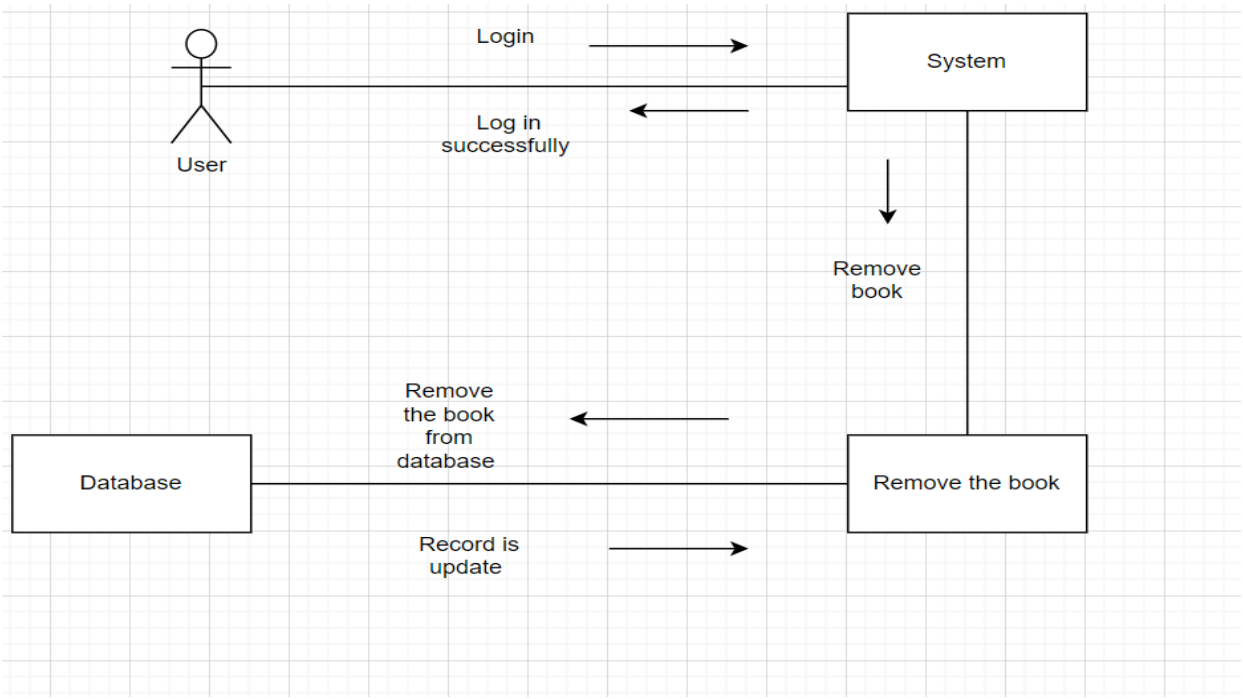


Figure 3.8.2.6: Collaboration Diagram # 12, User Delete Book

3.8.2.7 User Download Book

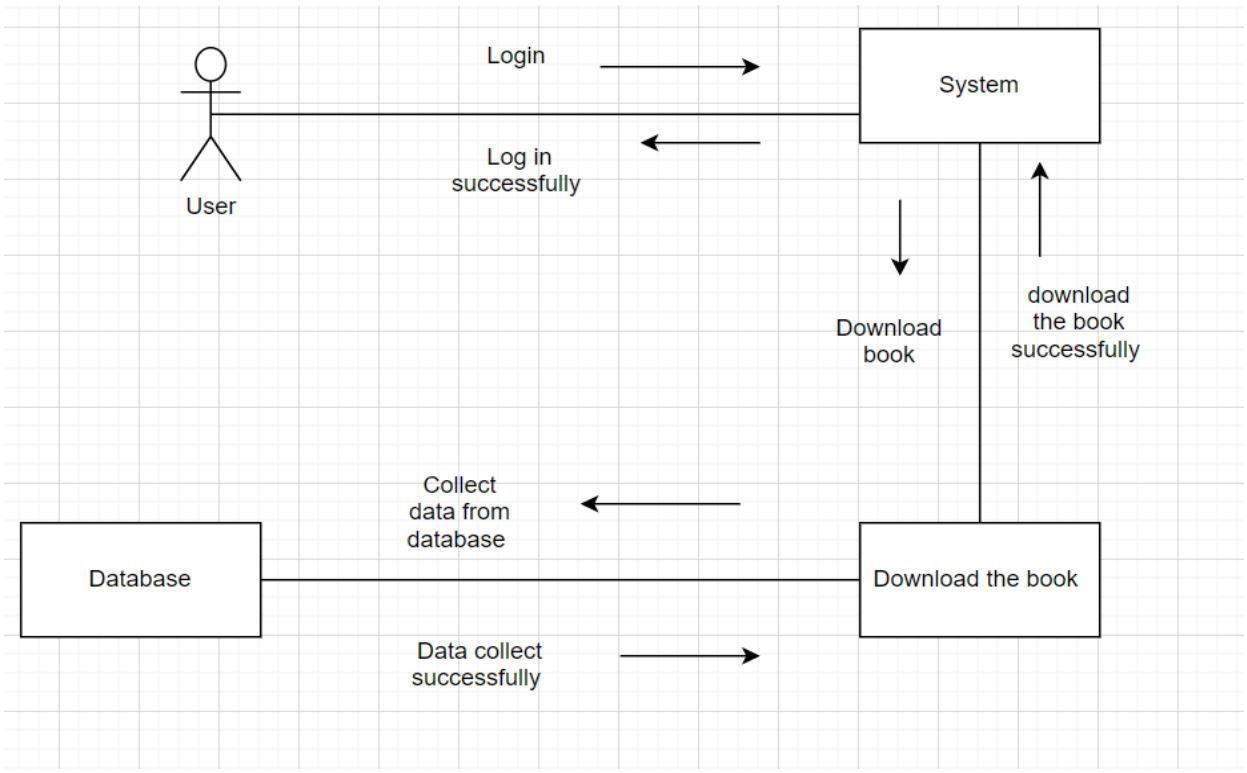


Figure 3.8.2.7: Collaboration Diagram # 13, User Download Book

3.8.2.8 Remove Garbage Text

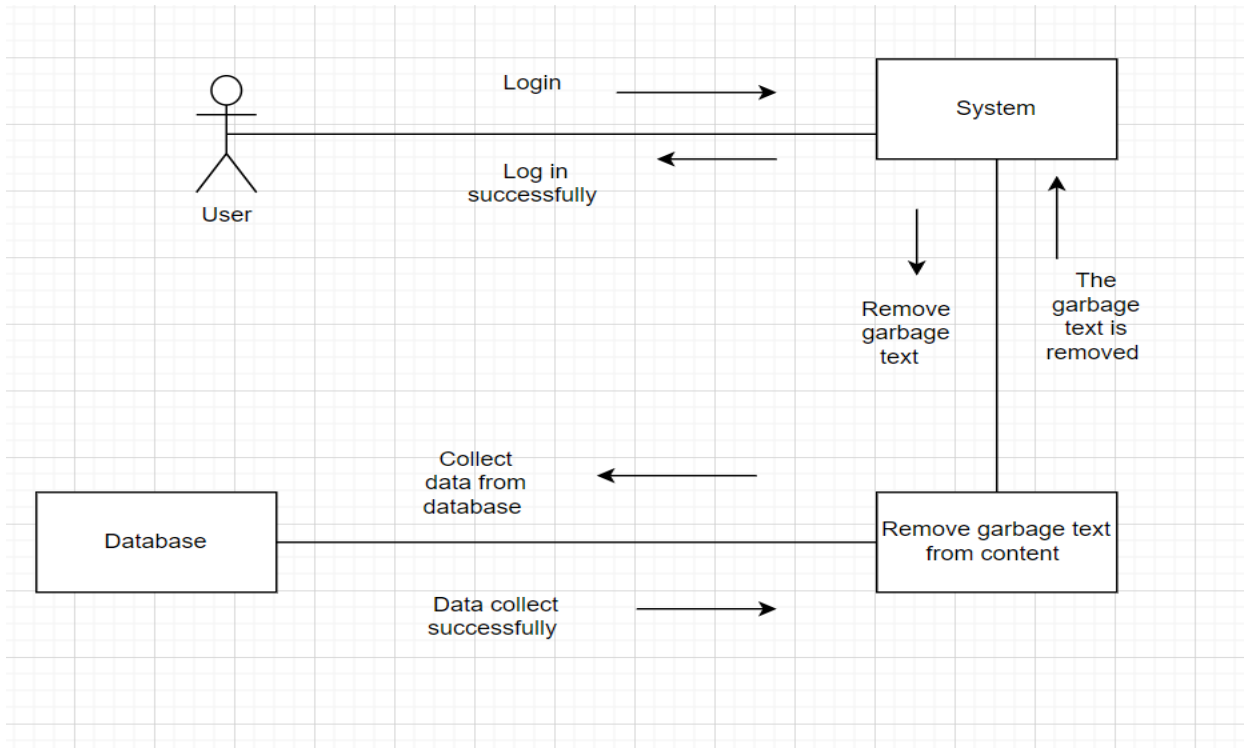


Figure 3.8.2.8: Collaboration Diagram # 14, Remove Garbage Text

3.8.2.9 User Search Book

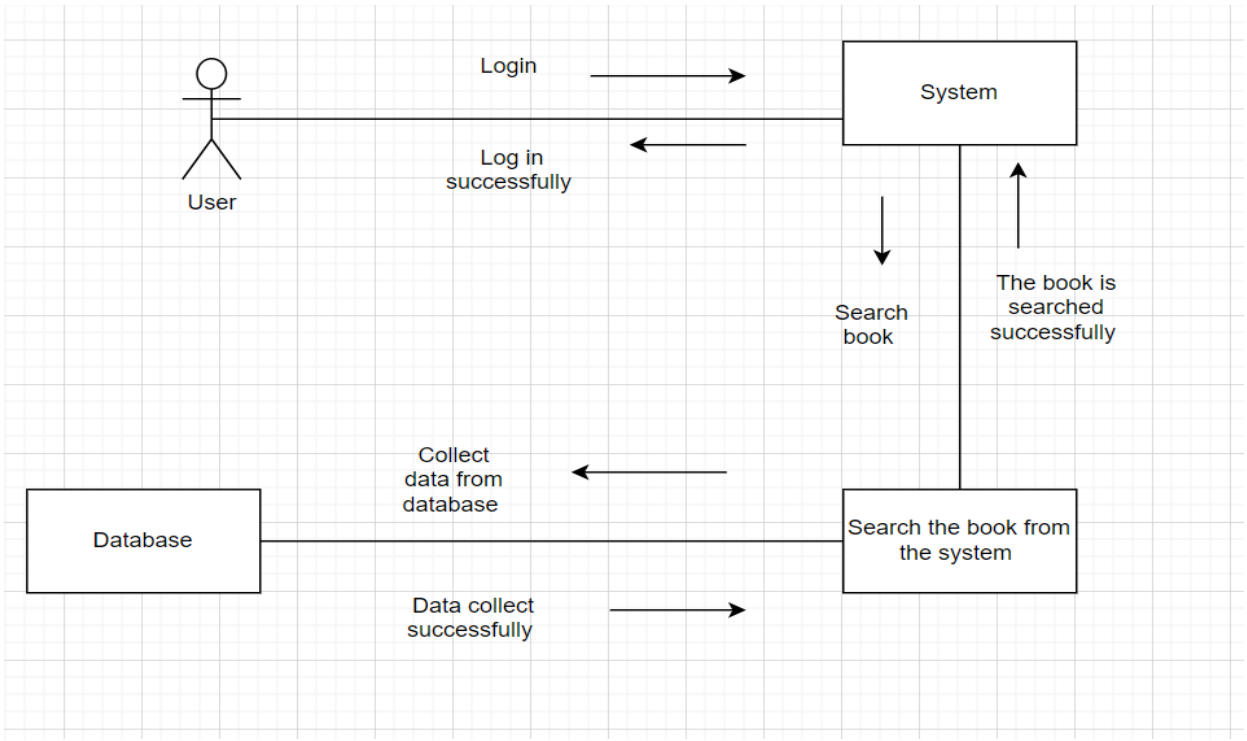


Figure 3.8.2.9: Collaboration Diagram # 15, User Search Book

3.8.2.10 User Pause Audio

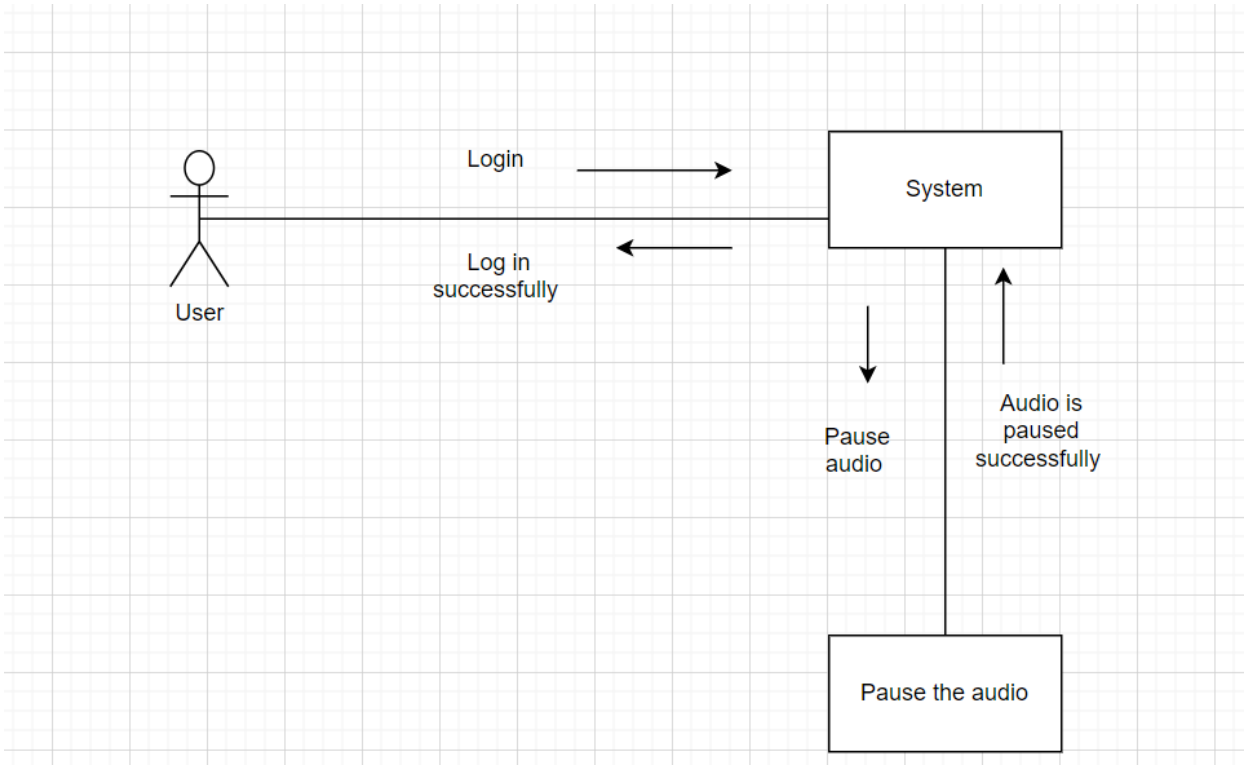


Figure 3.8.2.10: Collaboration Diagram # 16, User Pause Audio

3.8.2.11 User Restart Audio

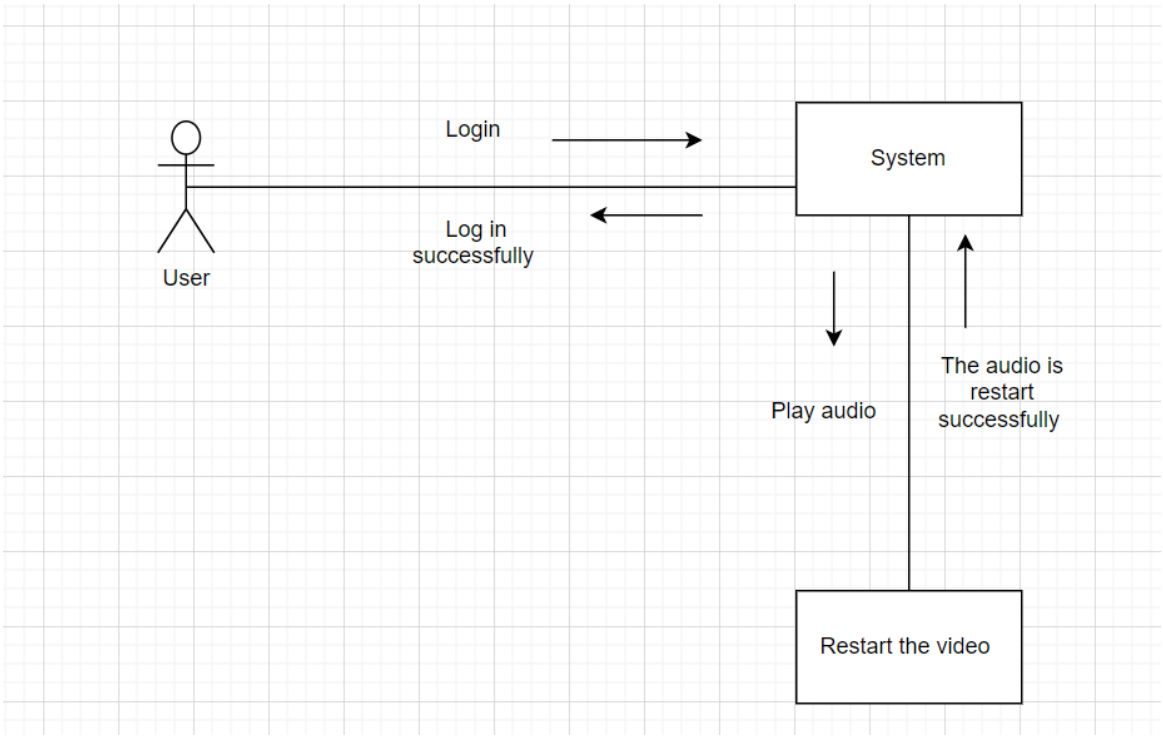


Figure 3.8.2.11: Collaboration Diagram # 17, User Restart Audio

3.8.2.12 User Rate Book

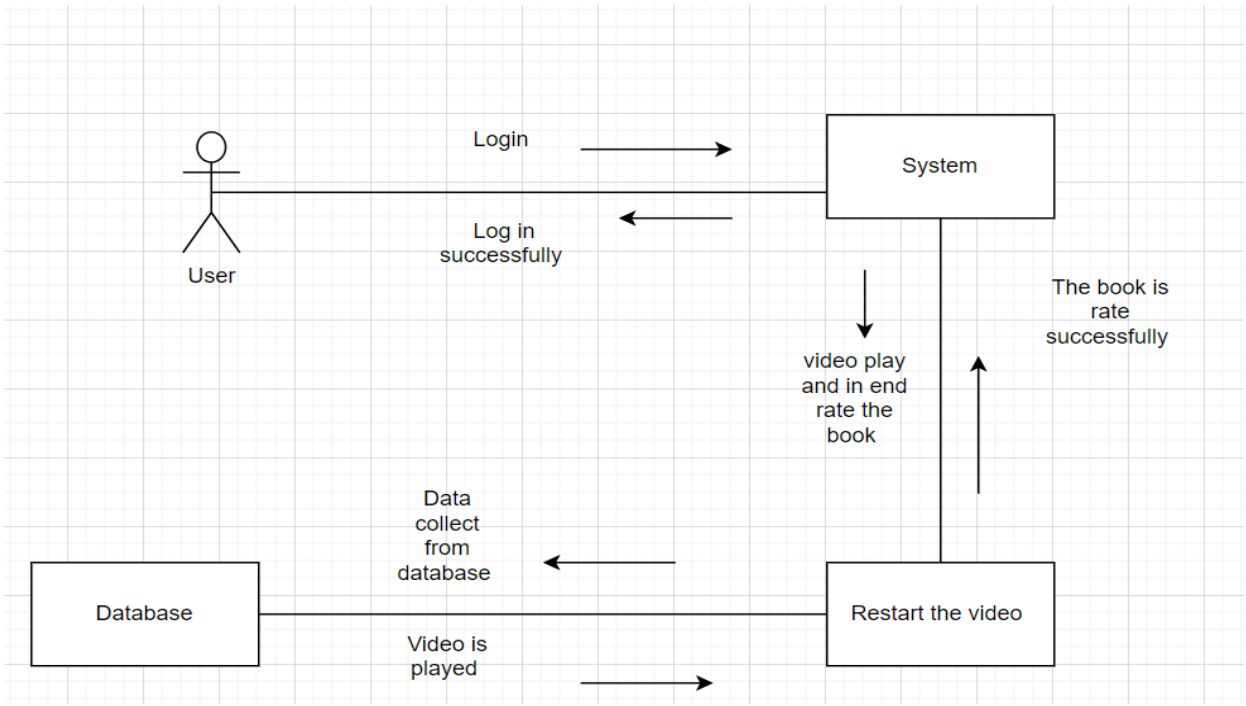


Figure 3.8.2.12: Collaboration Diagram # 18, User Rate Book

3.8.2.13 User Deactivate Account

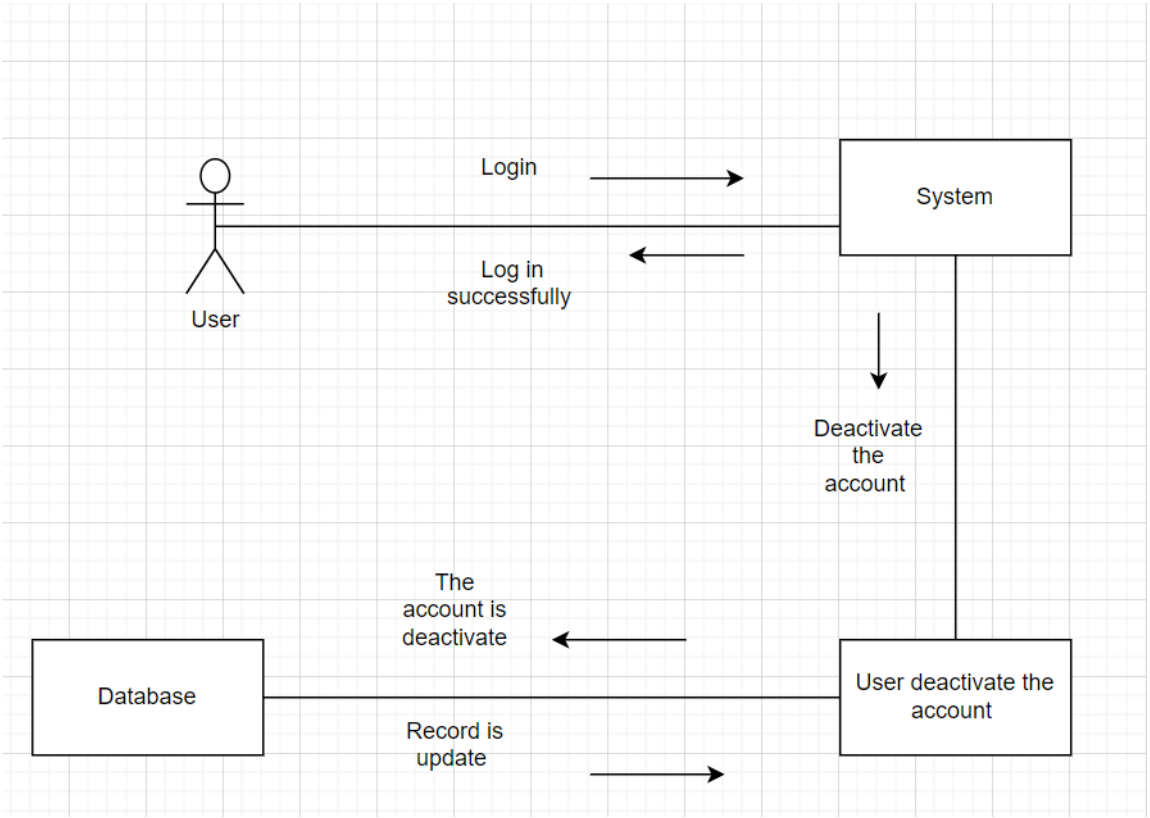


Figure 3.8.2.13: Collaboration Diagram # 19, User Deactivate Account

3.8.2.14 User Change Password

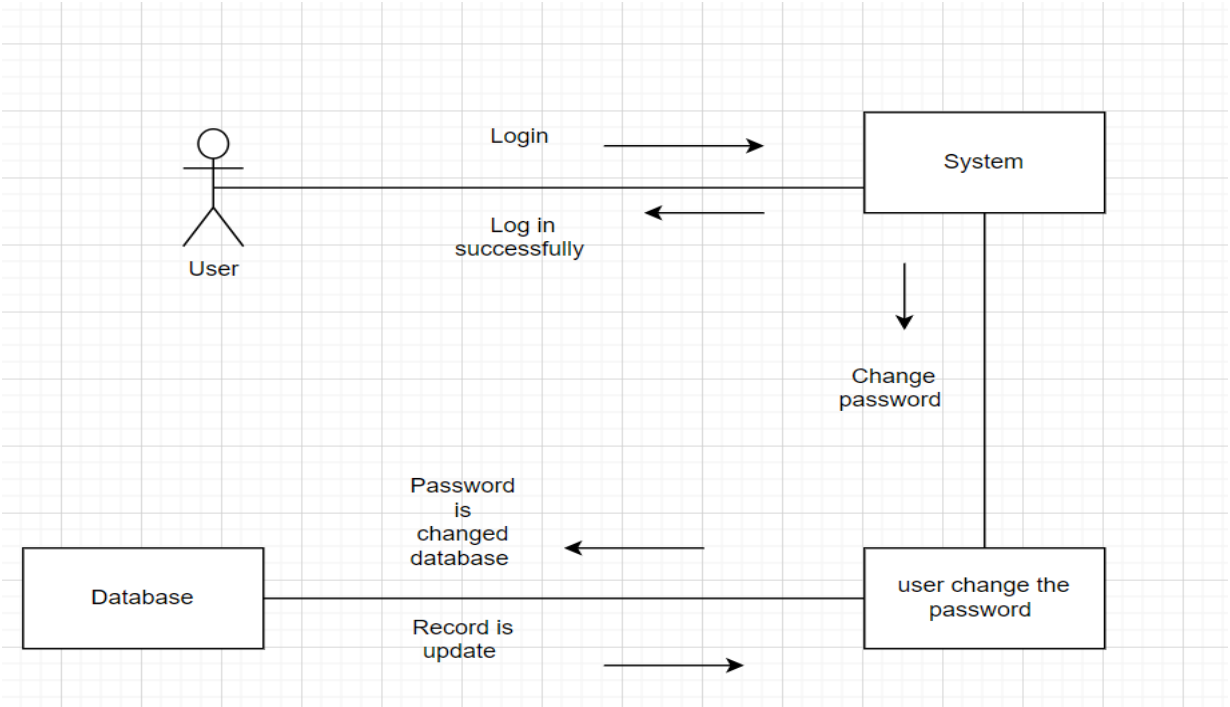


Figure 3.8.2.14: Collaboration Diagram # 20, User Change Password

3.8.2.15 User View Account Information

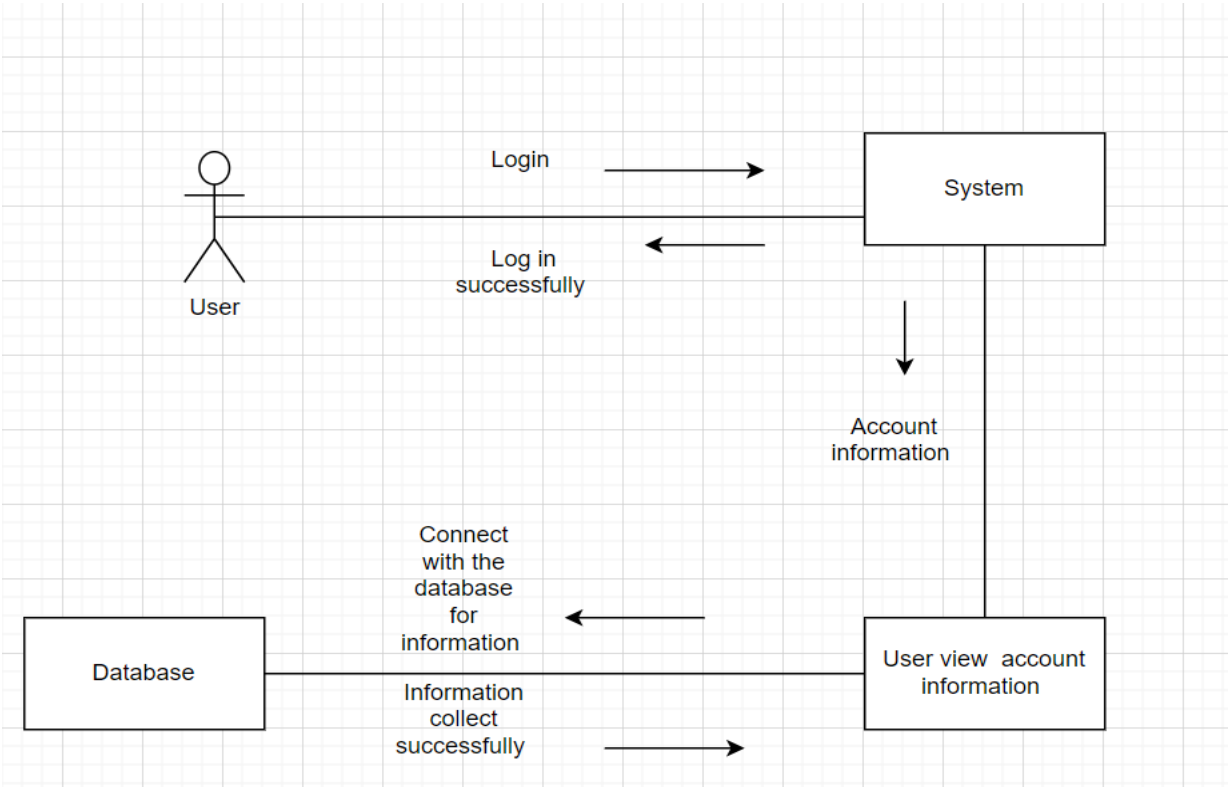


Figure 3.8.2.15: Collaboration Diagram # 21, User View Account Information

3.8.2.16 Highlight Text

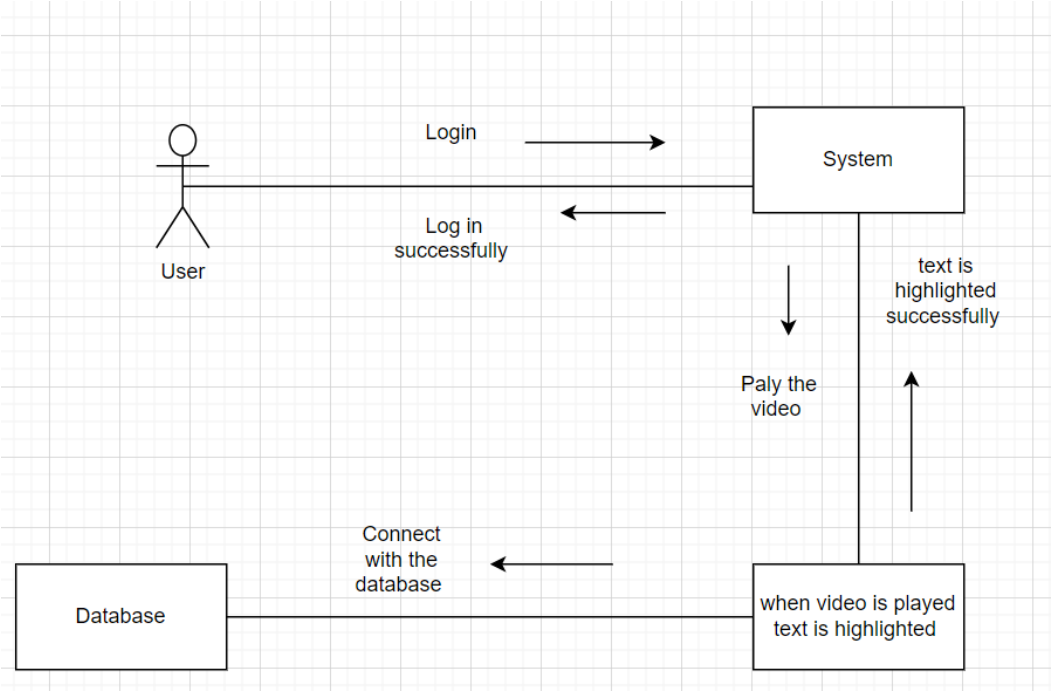


Figure 3.8.2.16: Collaboration Diagram # 22, Highlight Text

3.8.2.17 User Make Book Public

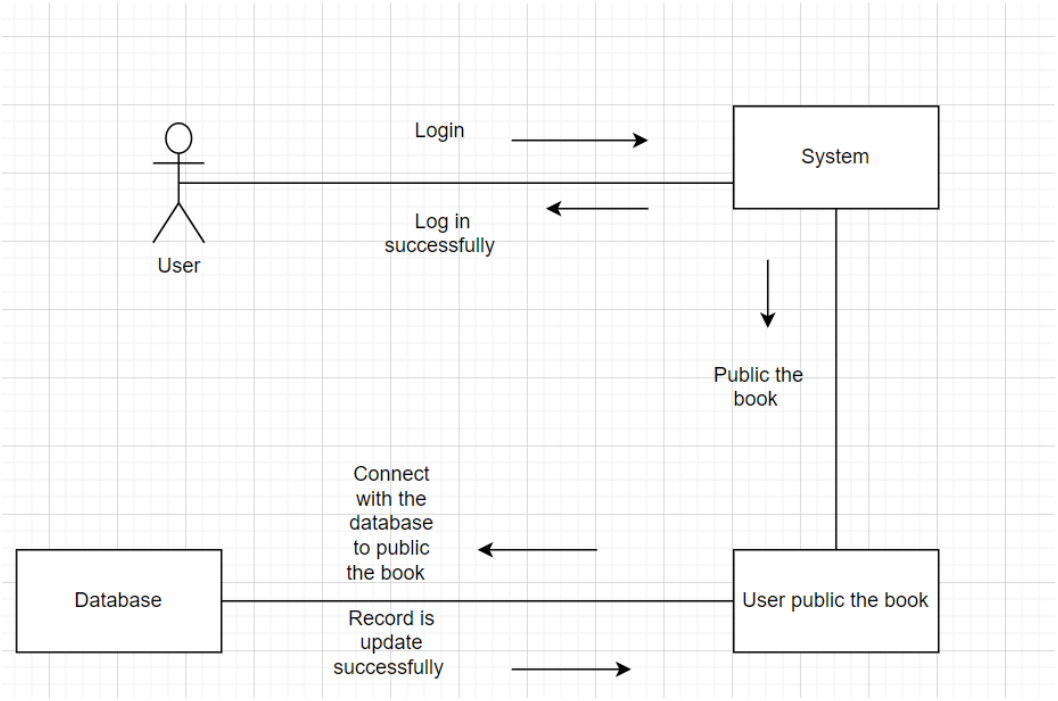


Figure 3.8.2.17: Collaboration Diagram # 23, User Make Book Public

3.8.2.18 User Make Book Private

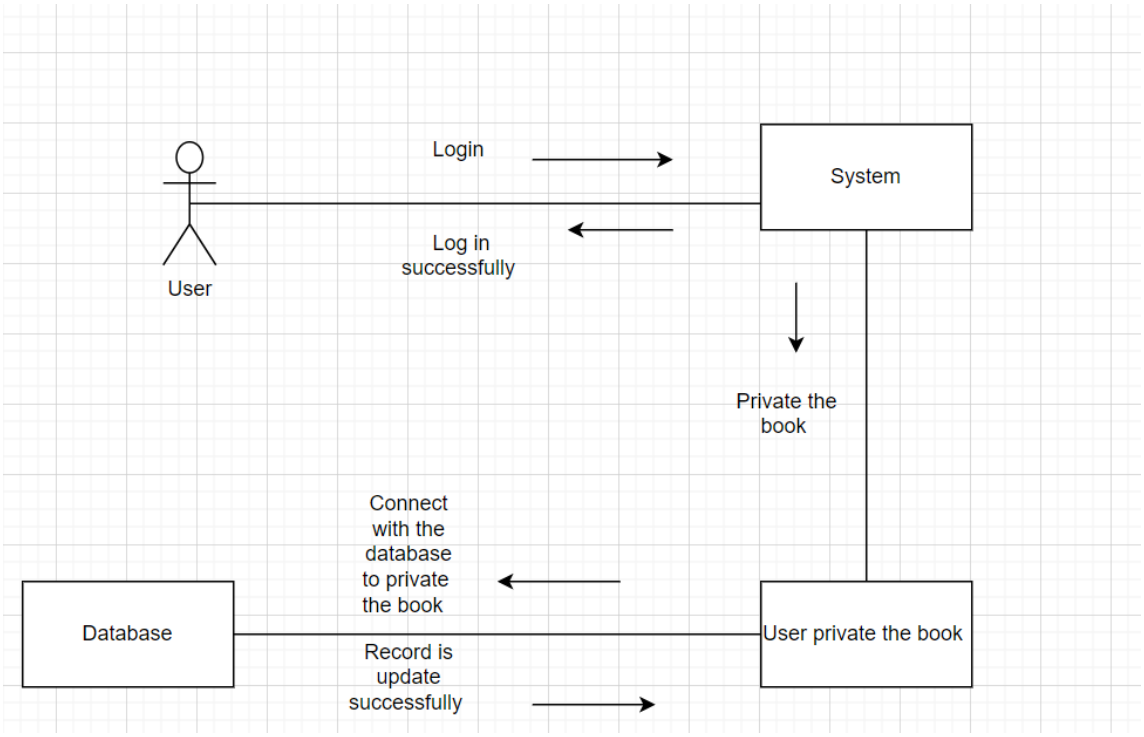


Figure 3.8.2.18: Collaboration Diagram # 24, User Make Book Private

3.8.3 Aggregated Collaboration Diagram

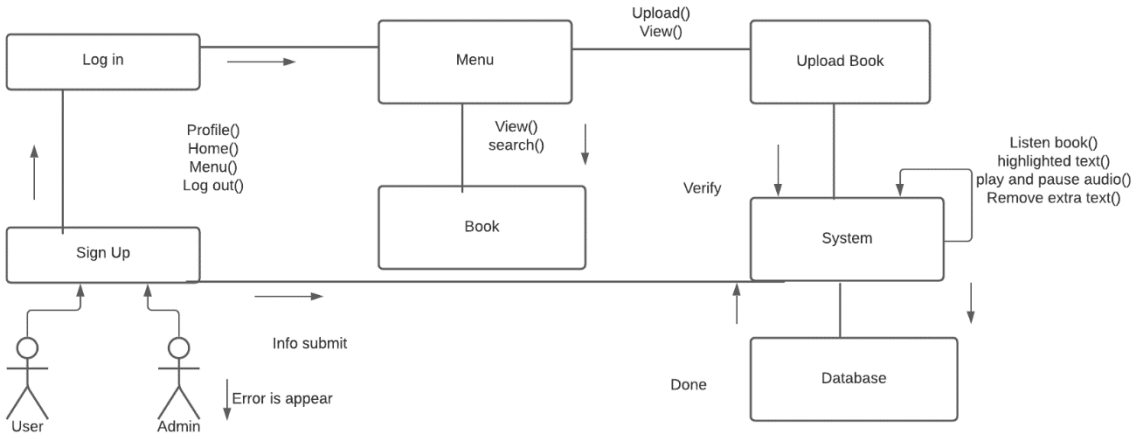


Figure 3.8.3: Aggregated Collaboration Diagram

3.9 State Transition Diagram

3.9.1 Admin State Transition Diagram

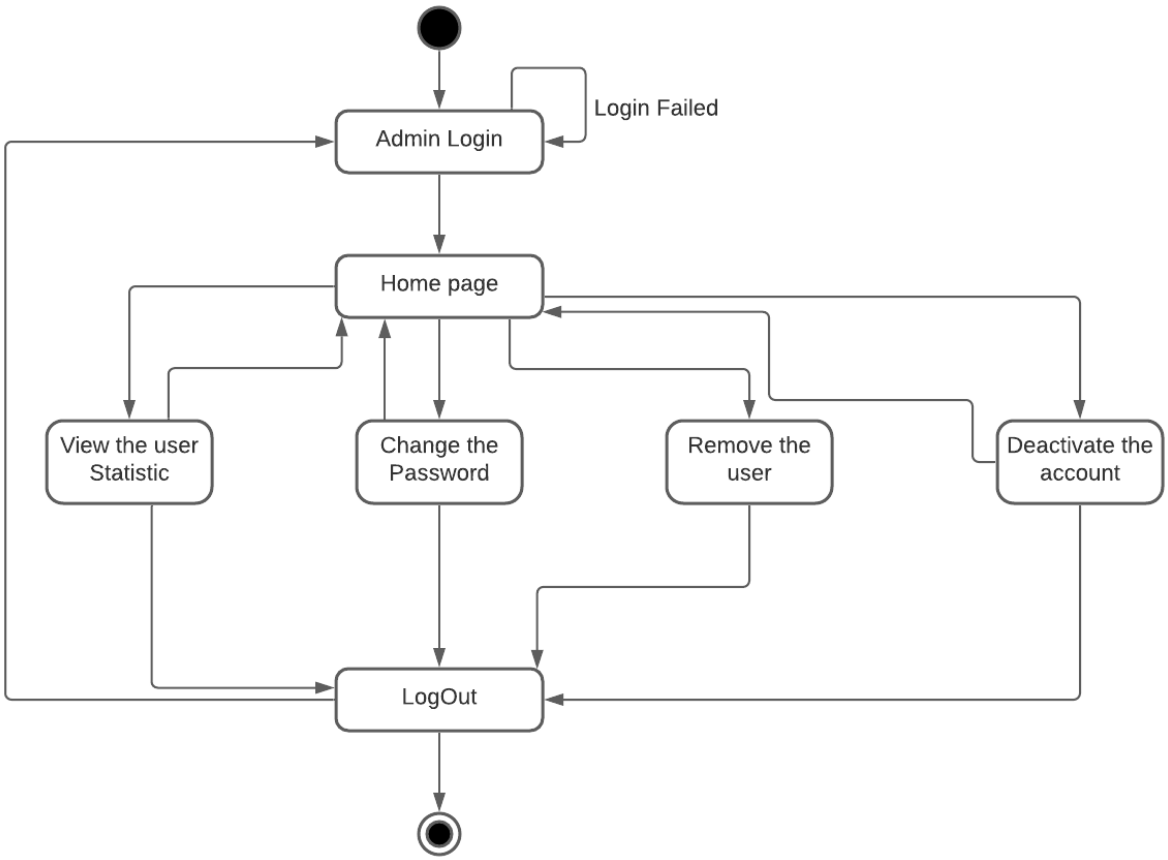


Figure 3.9.1: Admin State Transition Diagram

3.9.2 User State Transition Diagram

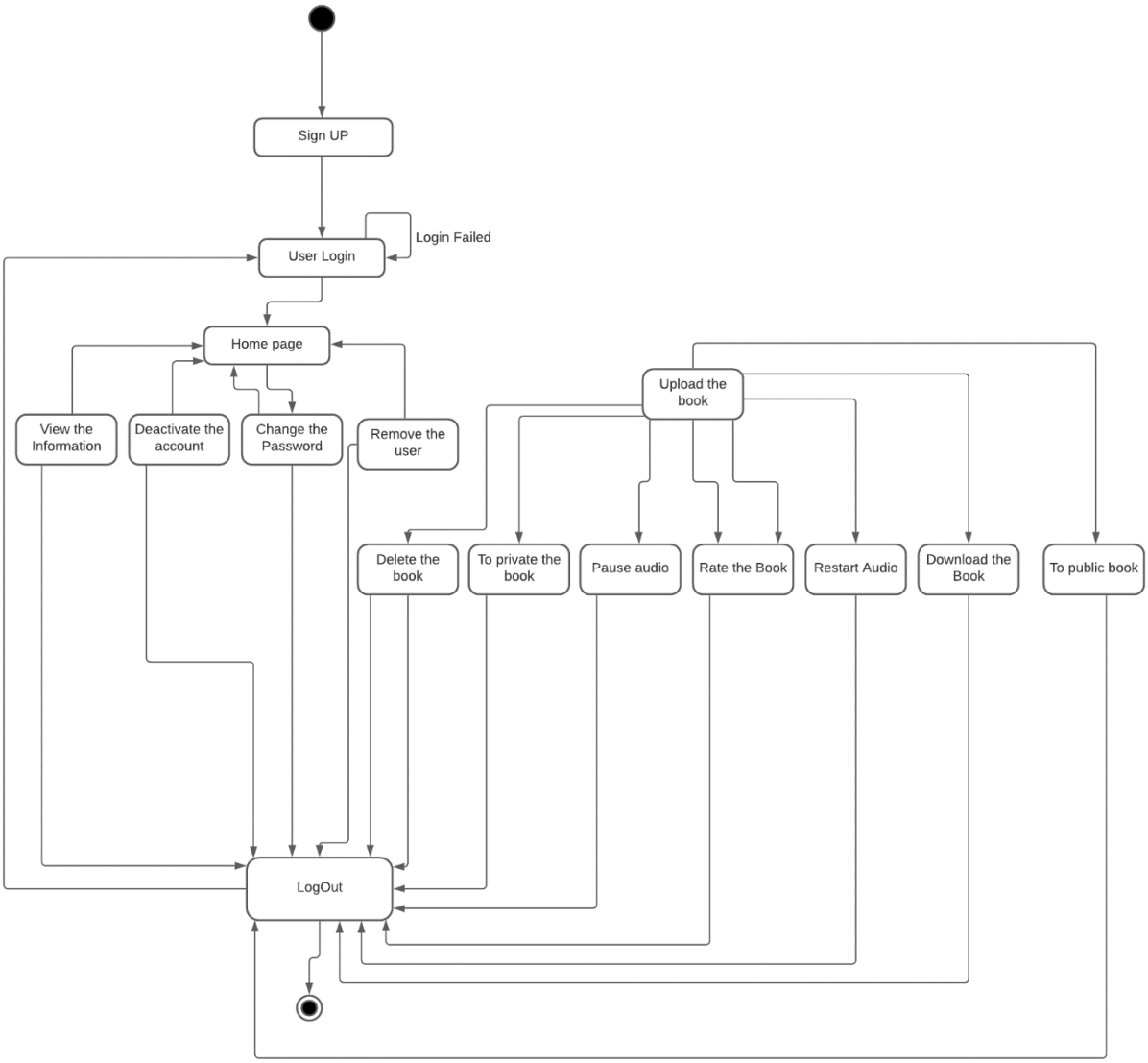


Figure 3.9.2: User State Transition Diagram

3.10 Component Diagram

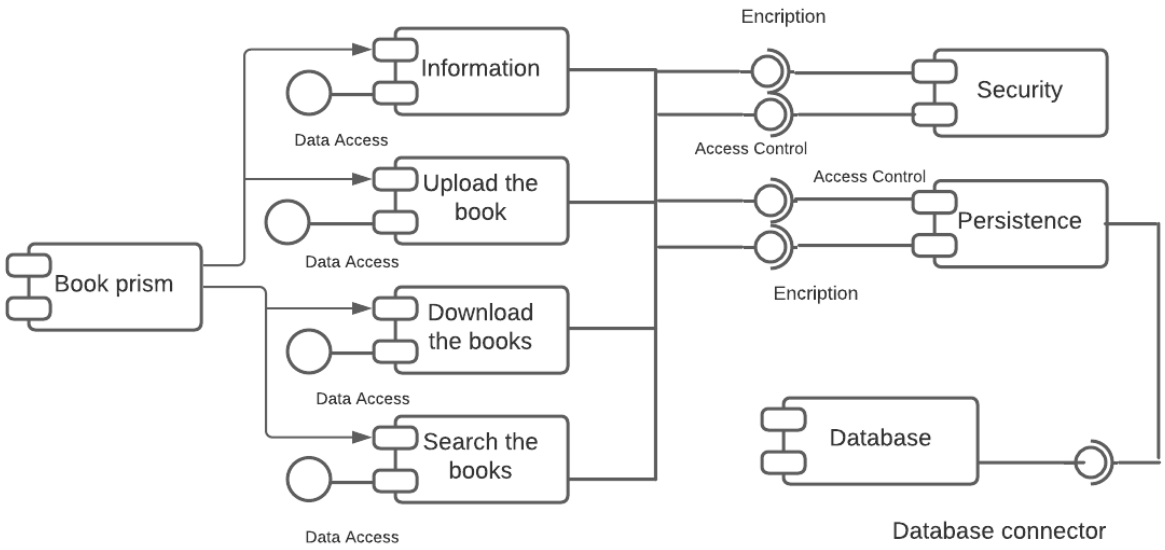


Figure 11.10: Component Diagram

3.11 Deployment Diagram

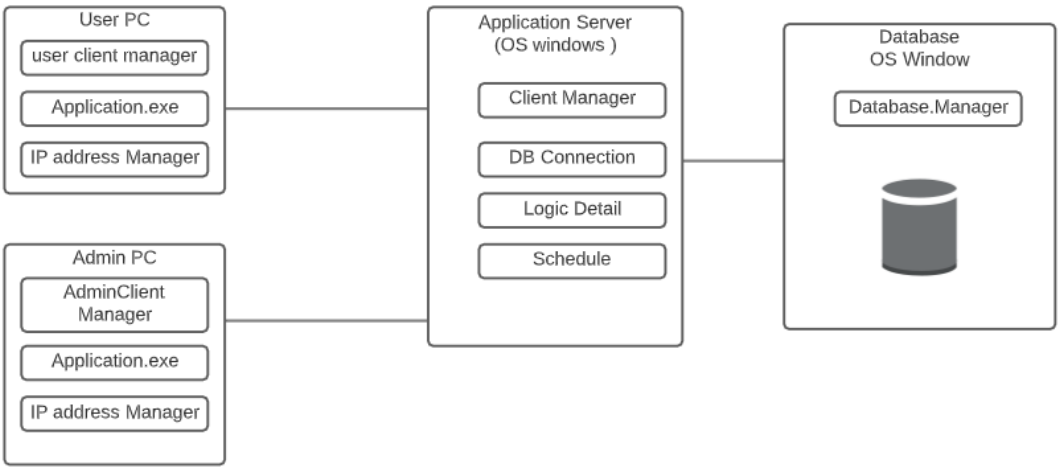


Figure 3.11: Deployment Diagram

CHAPTER 4

DATA AND EXPERIMENTS (and/or IMPLEMENTATION)

4.1 Languages used for Implementation:

4.1.1 Python:

Python is an interpreted high-level general purpose programming language. Its object-oriented approach aims to help programmers write clear, logical code for small and large-scale projects. As our project is based on the artificial intelligence and machine learning, so python is the best platform to implement the AI concepts.

4.1.2 ReactJS

React.js is an open-source JavaScript library that is used for building user interfaces specifically for single-page applications. It's used for handling the view layer for web and mobile apps. React also allows us to create reusable UI components. The front end of our project is created in web-based languages like CSS, HTML and JavaScript which will be implemented for modern styling.

4.1.3 MYSQL:

MySQL is the most popular Open-Source Relational SQL database management system. MySQL is one of the best RDBMS being used for developing web-based software applications.

4.2 Framework:

4.2.1 PyCharm with Django Framework:

It is an integrated development environment used in computer programming, specifically for the Python language. It provides smart code completion, code inspections, quick-fixes along with automated code refactoring and rich navigation capabilities. PyCharm takes care of creating specific directory structure and files required for a Django application and provides the correct settings.

4.3 Tools:

4.3.1 VS Code:

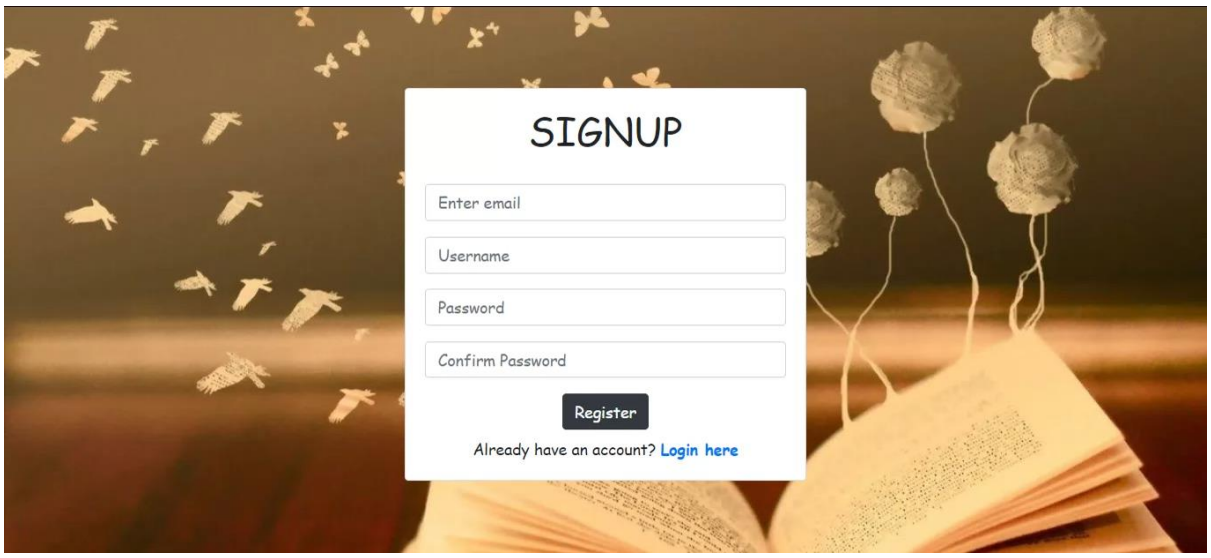
Visual Studio Code is a streamlined code editor with support for development operations like debugging, task running, and version control. It aims to provide just the tools a developer needs for a quick code-build-debug cycle and leaves more complex workflows to fuller featured IDEs, such as Visual Studio IDE.

CHAPTER 5

RESULTS AND DISCUSSIONS (or USER MANUAL)

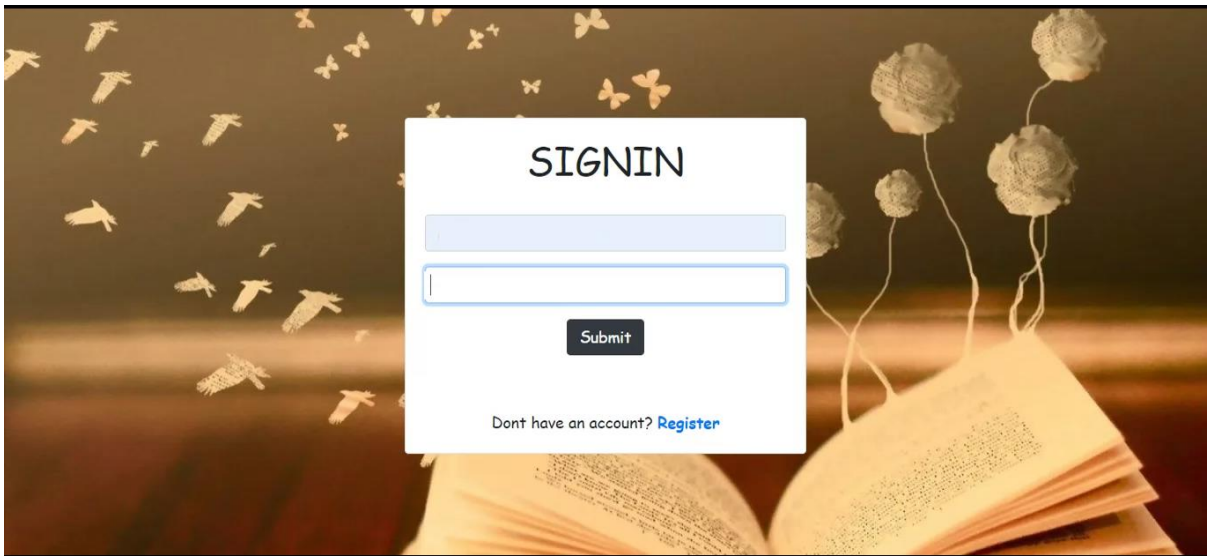
5.1 Sign-up page

- User can sign-up by entering their email, username, password



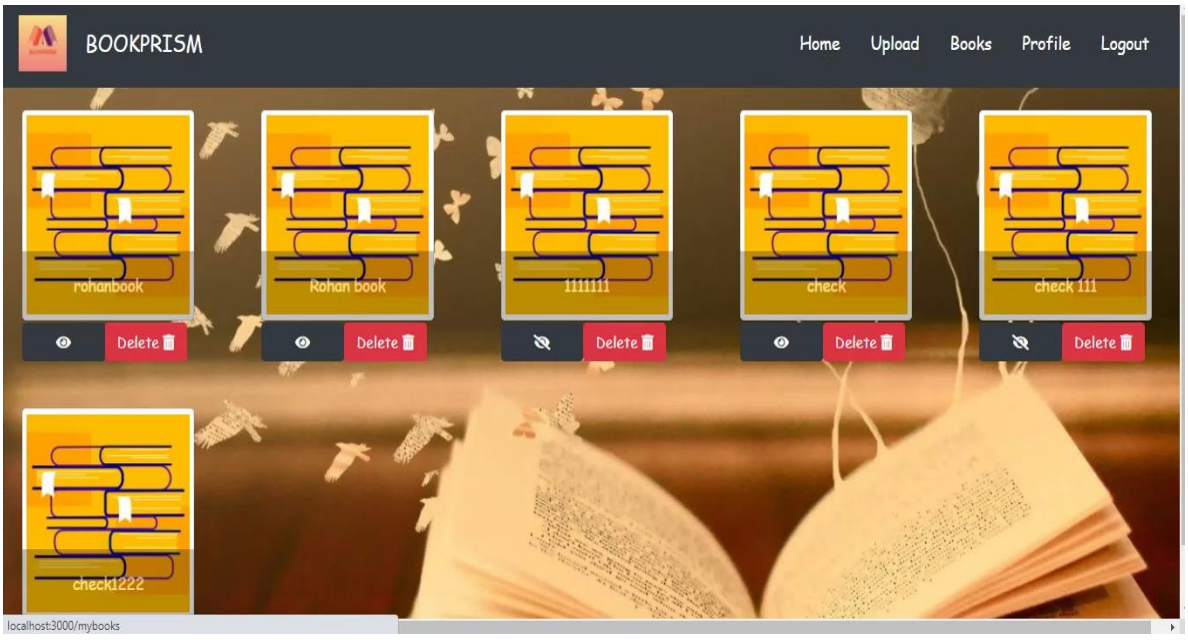
5.2 Sign-in Page

- User can sign-in by their username and password



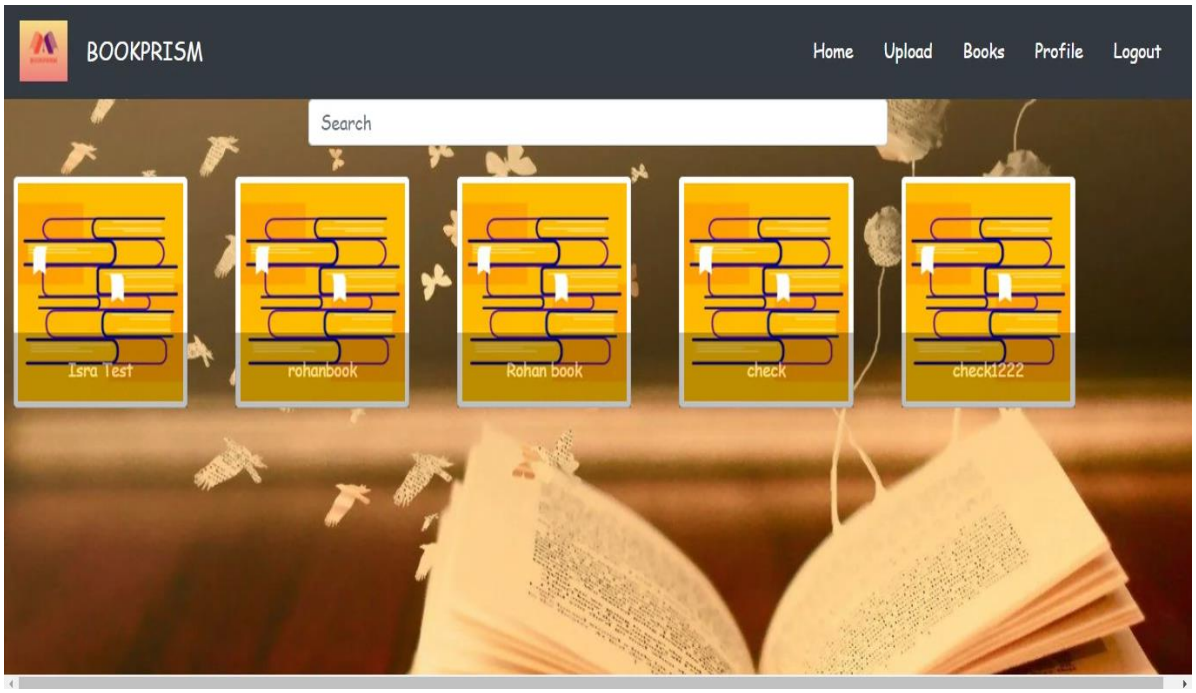
5.3 Home Page

- A homepage dashboard where all information are displayed.



5.4 Books Page:

- User can see the no of book that are uploaded.

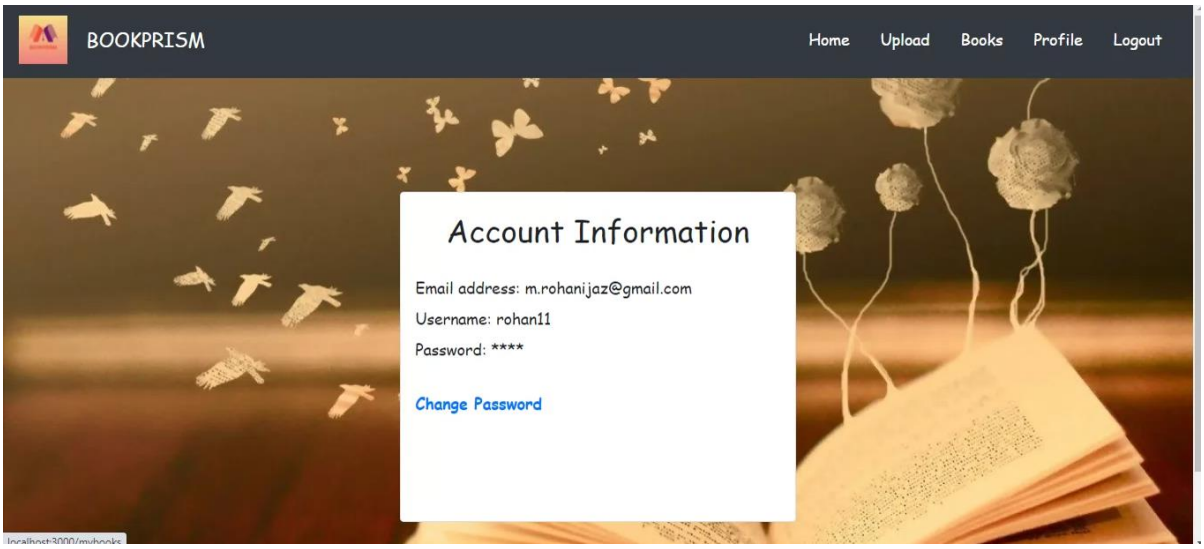


5.5 Upload Book Page

- User can upload a book in .JPG, .PNG format.

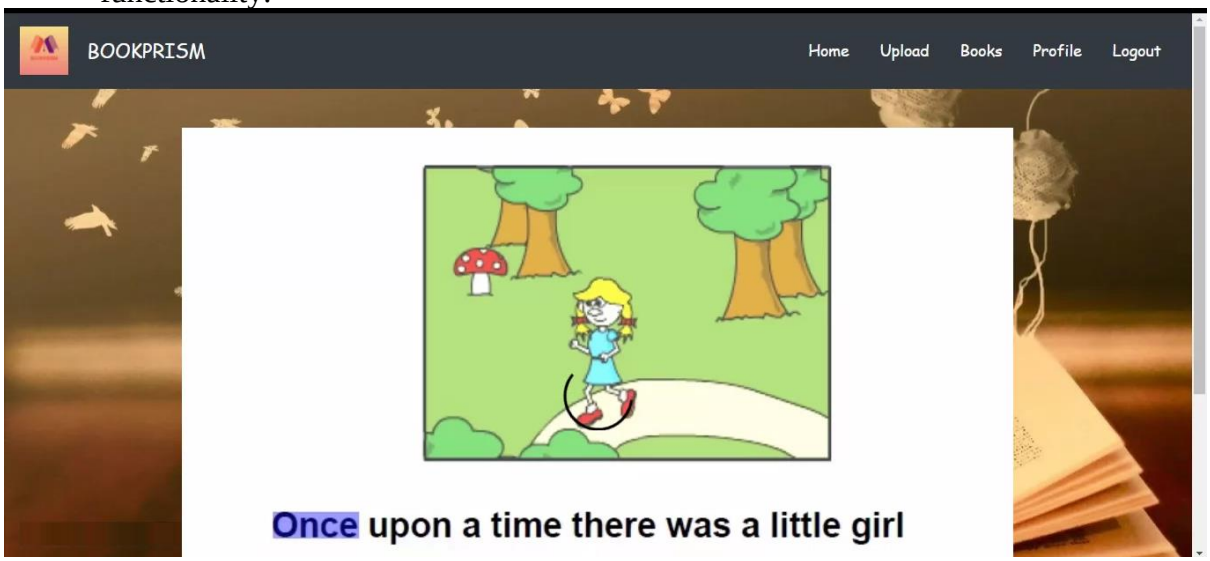
5.6 Account Information Page

- User can see their Account Information.



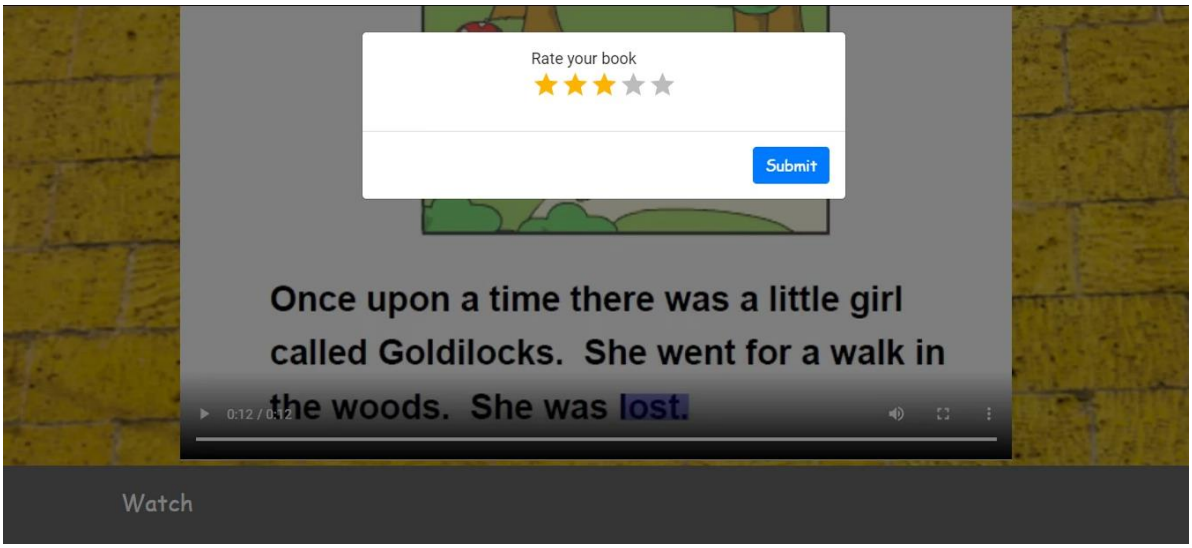
5.7 Modules Implementation

- In these phases, A user can hear that the system read the book with highlighted word functionality.



5.8 Book Rating

- User give rating after reading a book



CHAPTER 6

CONCLUSION AND RECOMMENDATIONS

The goal of this project is to create a web application that allows users to listen to audiobooks with speech synthesis and text highlighting. The input data will be provided in either text or picture format. As previously indicated, this application would be based on five parts. The first is a text-to-image conversion module. The second component is a voice processing module that converts text into speech. The third module involves removing trash text from the storybook, including page numbers and title of the storybooks at the top of the page. We will also synchronise text and speech in the fourth module. We will also synchronise text and speech in the fourth module. Scanning the heavens for other intelligent life out in space will be the future of image processing. Advances in image processing applications will also be included in new intelligent, digital species produced wholly by research experts in various countries across the world.

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