वनस्थली विद्यापीठ
Banasthali University
University for Women : University with a difference

SOFTWARE DESIGN DESCRIPTION

On

Digital Library

GROUP ID: B-29

PROJECT GUIDE:

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5. APPENDIX

1. INTRODUCTION:

1.1 Purpose:

The purpose of this document is to present the software design in developing the android application providing facilities to read books online, download the same, and notify the intended users about the requested as well as new arrival of book. It describes all data, architectural, interface and component-level design. It also explains the various modules of the application.

1.2 Scope:

Android application for digital library is for readers where one can discover variety of books, spanning across different genres including classics, science and technology, general fiction, historical fiction, non-fiction, poetry, spiritual, others.

The term "***Digital Library***" has a variety of potential meanings, ranging from a digitized collection of material that one might find in a traditional ***library*** through to the collection of all ***digital*** information along with the services that make that information useful to all possible users.

Basically, this application will provide facilities for user to read and notify them about the new arrivals. This application contains a centralized NoSQL database containing mainly a list of registered users, authors, books, genres, requests.

1.3 Definitions, Acronyms, and Abbreviations:

Firebase: It is a mobile and web application development platform.

NoSQL: NoSQL database provides a mechanism for storage and retrieval of data that is modeled in means other than the tabular relations used in relational databases.

Admin: A **administrator**, or admin, is a person who is responsible for the upkeep, configuration, and reliable operation of systems.

App: The term *app* is a shorter form of application program. An application program is a program designed to perform a specific function directly for the user or, in some cases, for another application program.

IEEE: Institute of Electrical and Electronics Engineers.

ID: Identity

SDD: A **software designed description** (**SDD**) is a representation of a software system created to facilitate analysis, planning, implementation, and decision making. A blueprint or model of software system. The SDD is used as the primary medium for communicating software design information.

1.4 References

IEEE 830-1993 standard format is followed.

Software Engineering by-Roger S. Pressman,5th Edition(TMG)

https://creately.com/diagram/example/i2k55oqk1/android%20app

https://www.draw.io/

https://www.lucidchart.com/pages/class-diagram-for-library-management-system-UML

https://www.tutorialspoint.com/uml/uml_activity_diagram.htm

1.5 Overview:

The next section, of this document gives an overview of the design of the product. It describes the informal architecture of the project.

Essentially:

Section 2, System Architectural Design: Specifies detailed description of application using Sequence diagram, Activity diagram, and Class diagram.

Section 3, Data Design: Specifies data designing (all database tables).

Section 4, User Interface Design: Specifies user interface design including screen images.

2. SYSTEM ARCHITECTURAL DESIGN

2.1 High Level Design Overview

This software is totally self-contained and works efficiently and it provides good and easy graphical user interface to both new, naïve as well as experienced users of the devices.

It uses 3-tier Architectures:

Presentation layer

The top-most level of the application is the user interface. the main function of the interface is to translate tasks and results to something the user can understand.

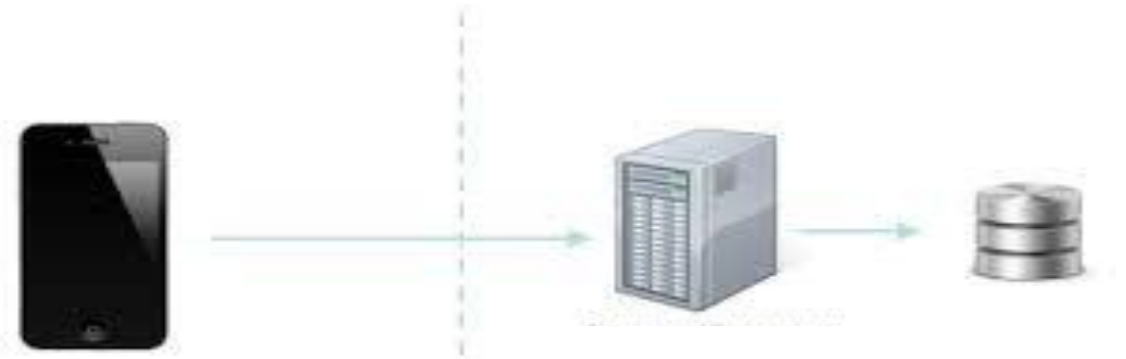
Logical layer

This layer coordinates the application, processes commands, makes logical decisions and evaluations, and performs calculations. It also moves and processes data between the two surrounding layers.

Data layer

Here information is stored and retrieved from a database or a file system. The information is then passed back to the logic tier for processing, and then eventually back to the user.

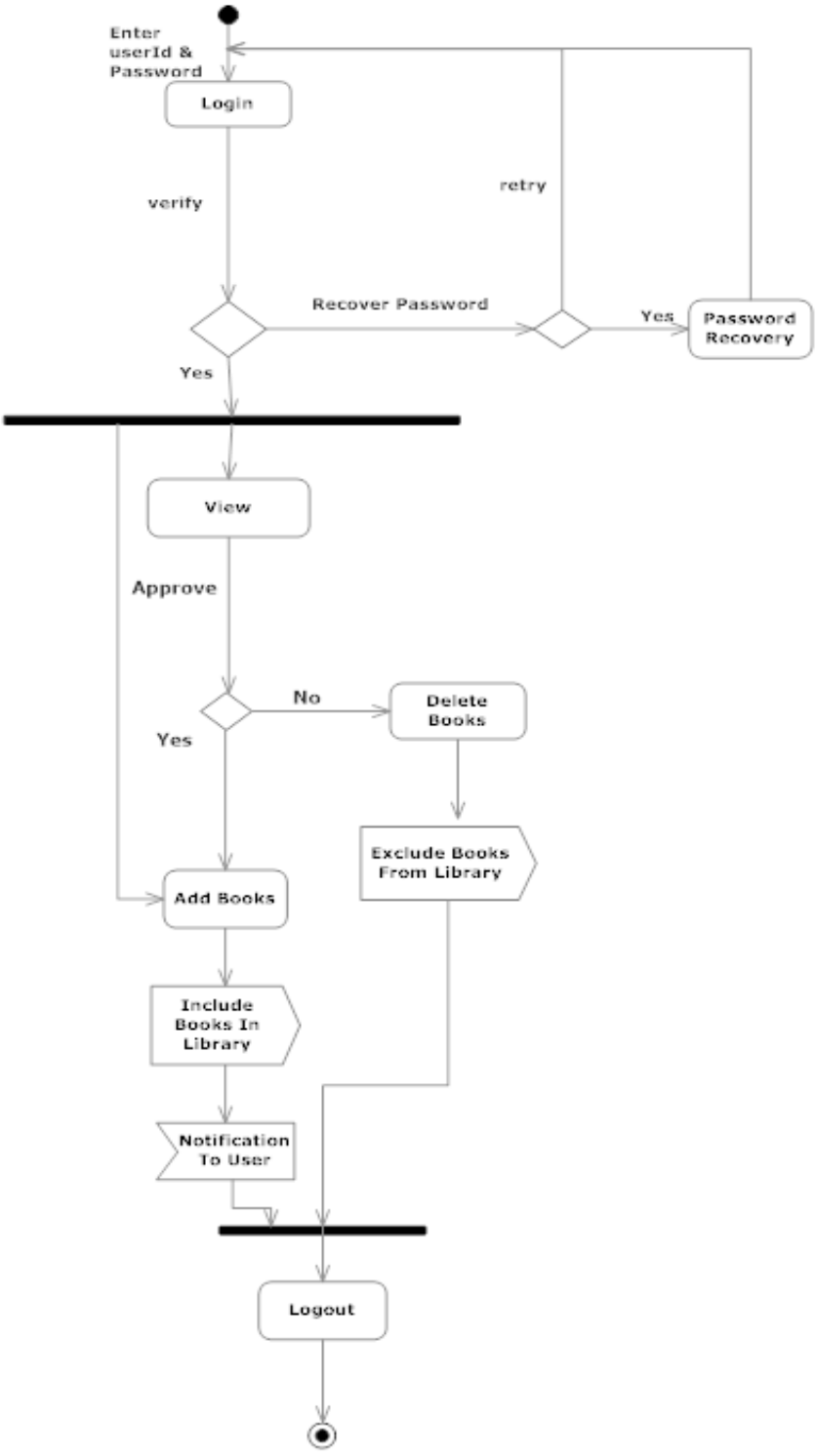
3-tier Architecture



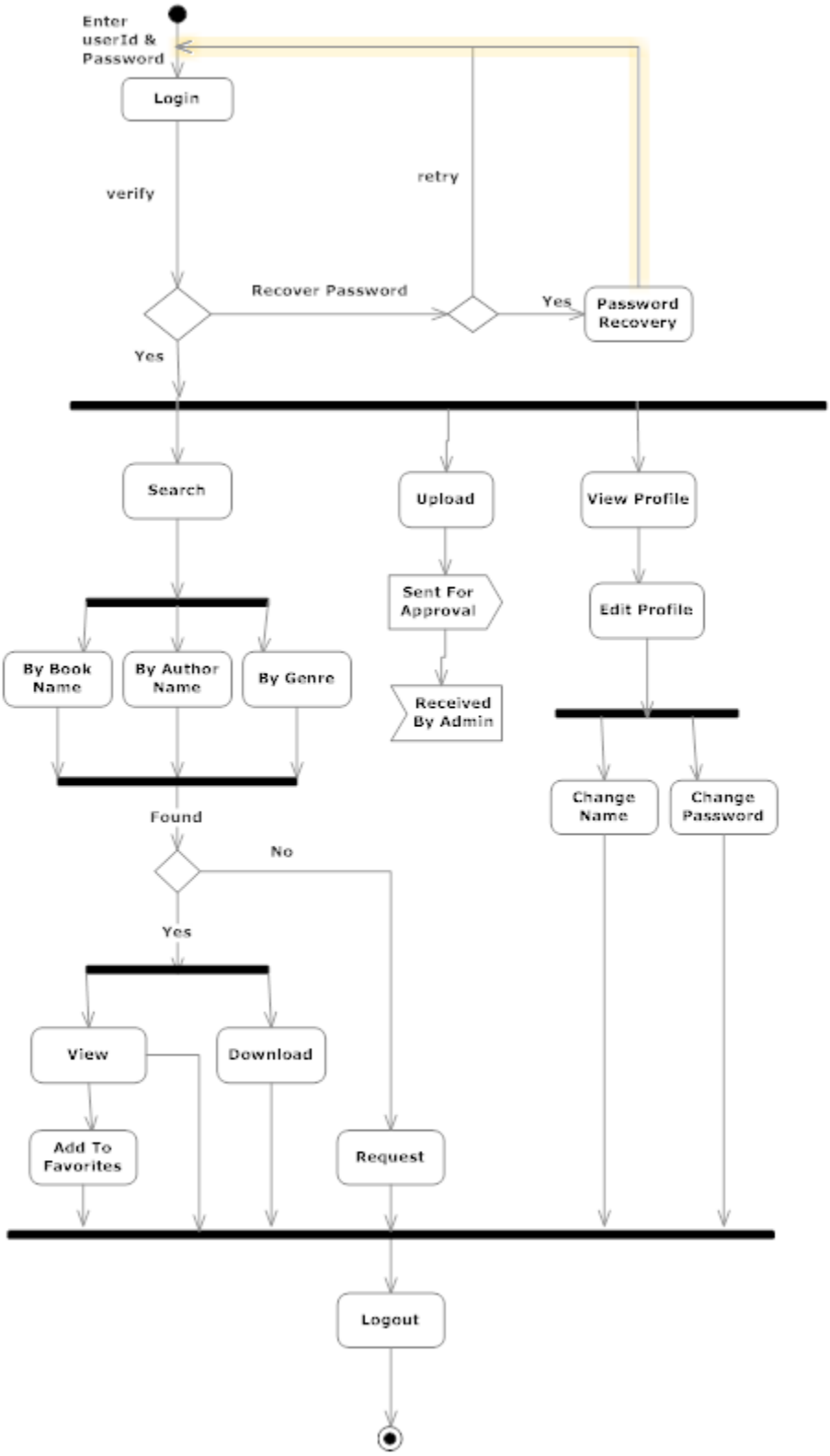
2.2 Detailed Description of Components

2.2.1 Activity diagram

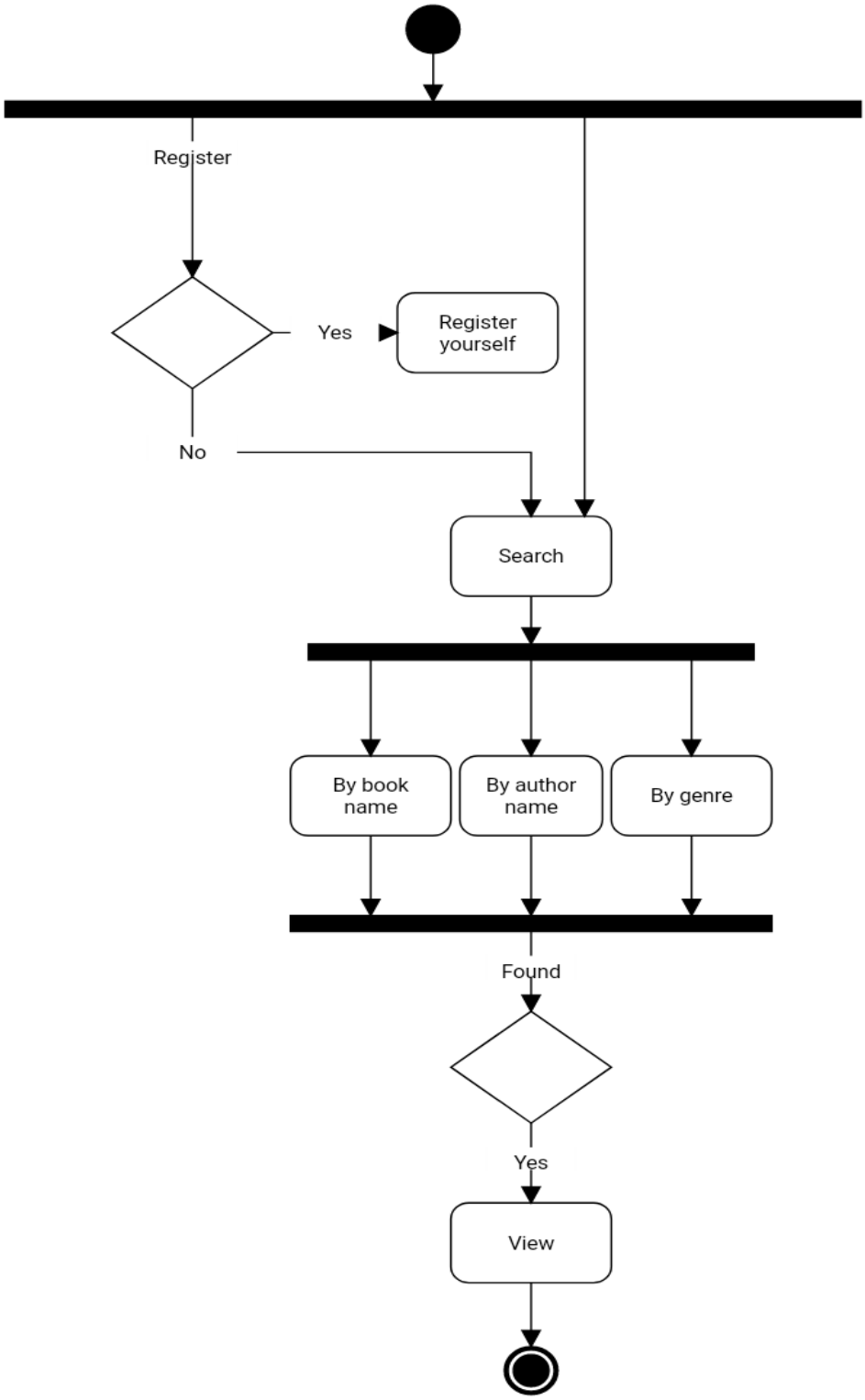
ADMIN



REGISTERED USER

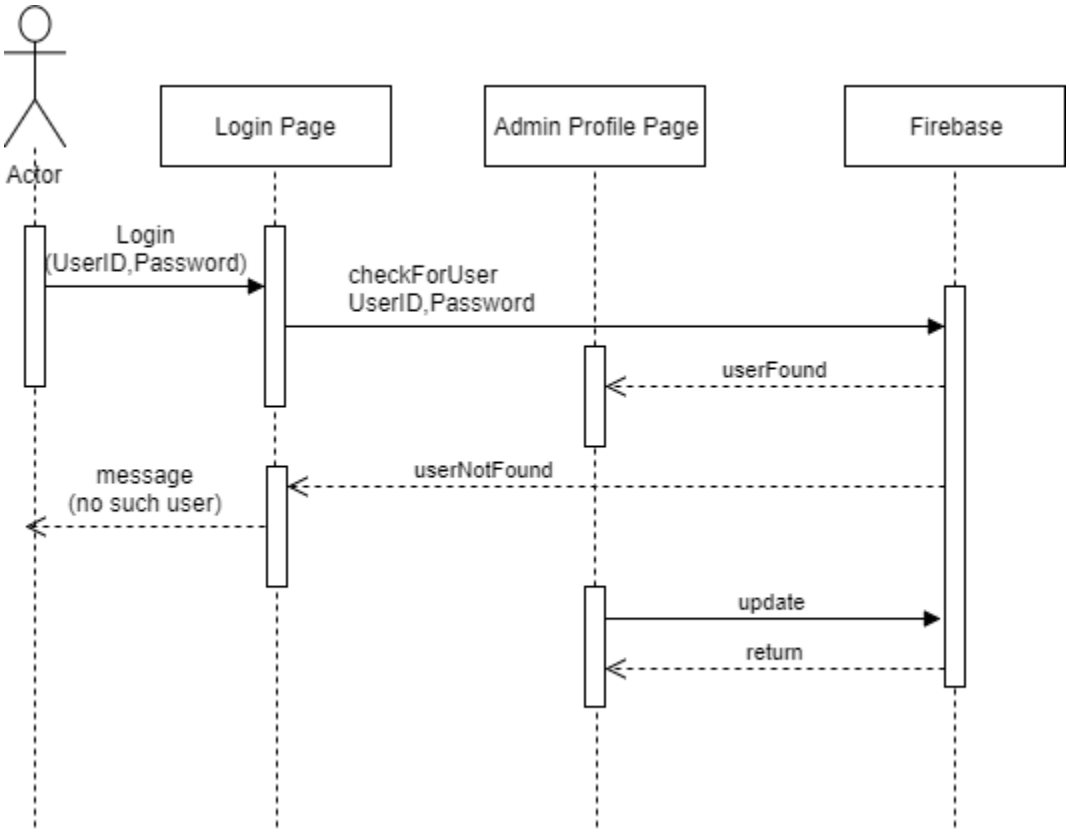


GUEST USER

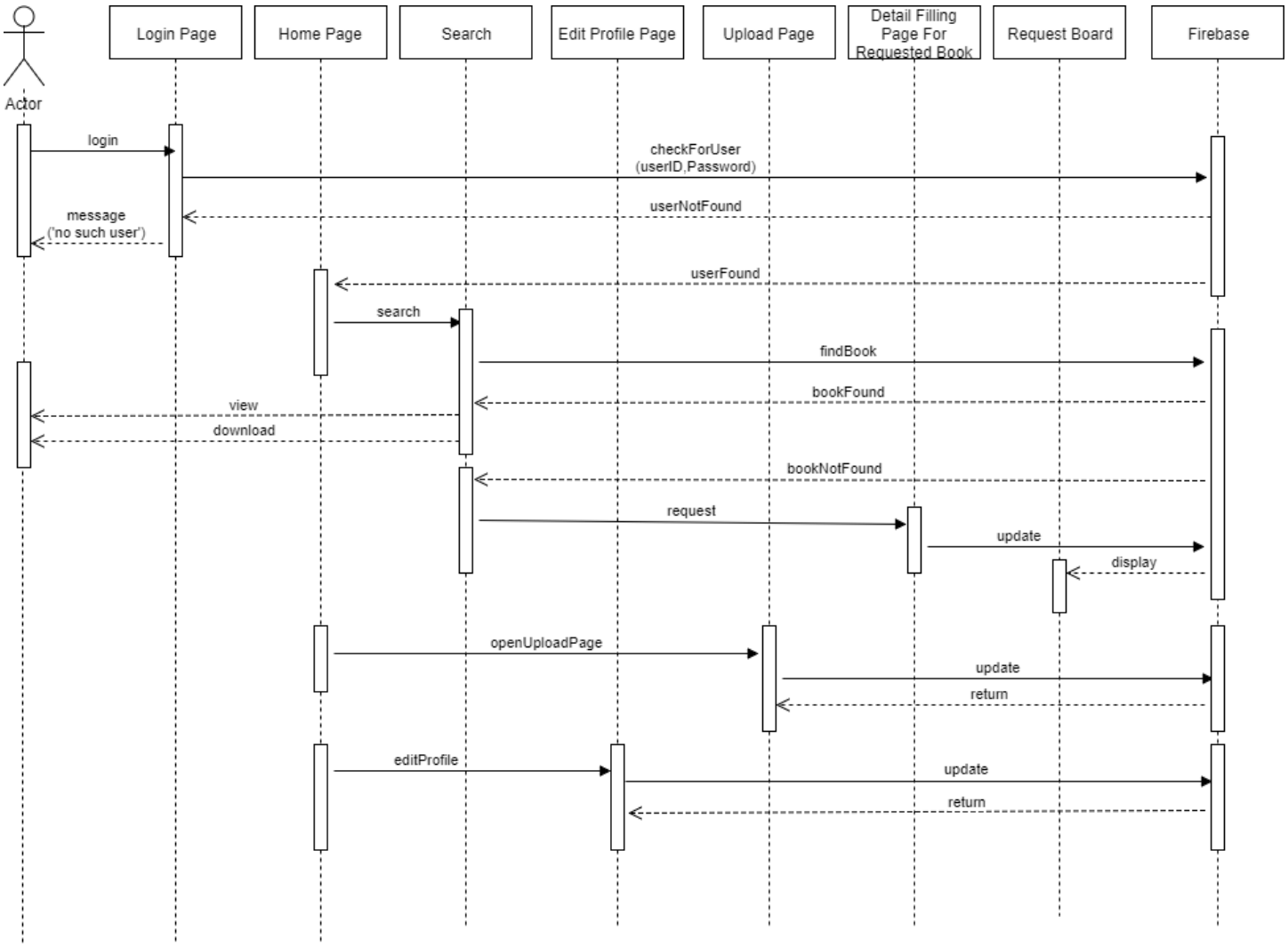

Register
Yes
Register yourself
No
Search
By book name
By author name
By genre
Found
Yes
View

2.2.2 Sequence diagram

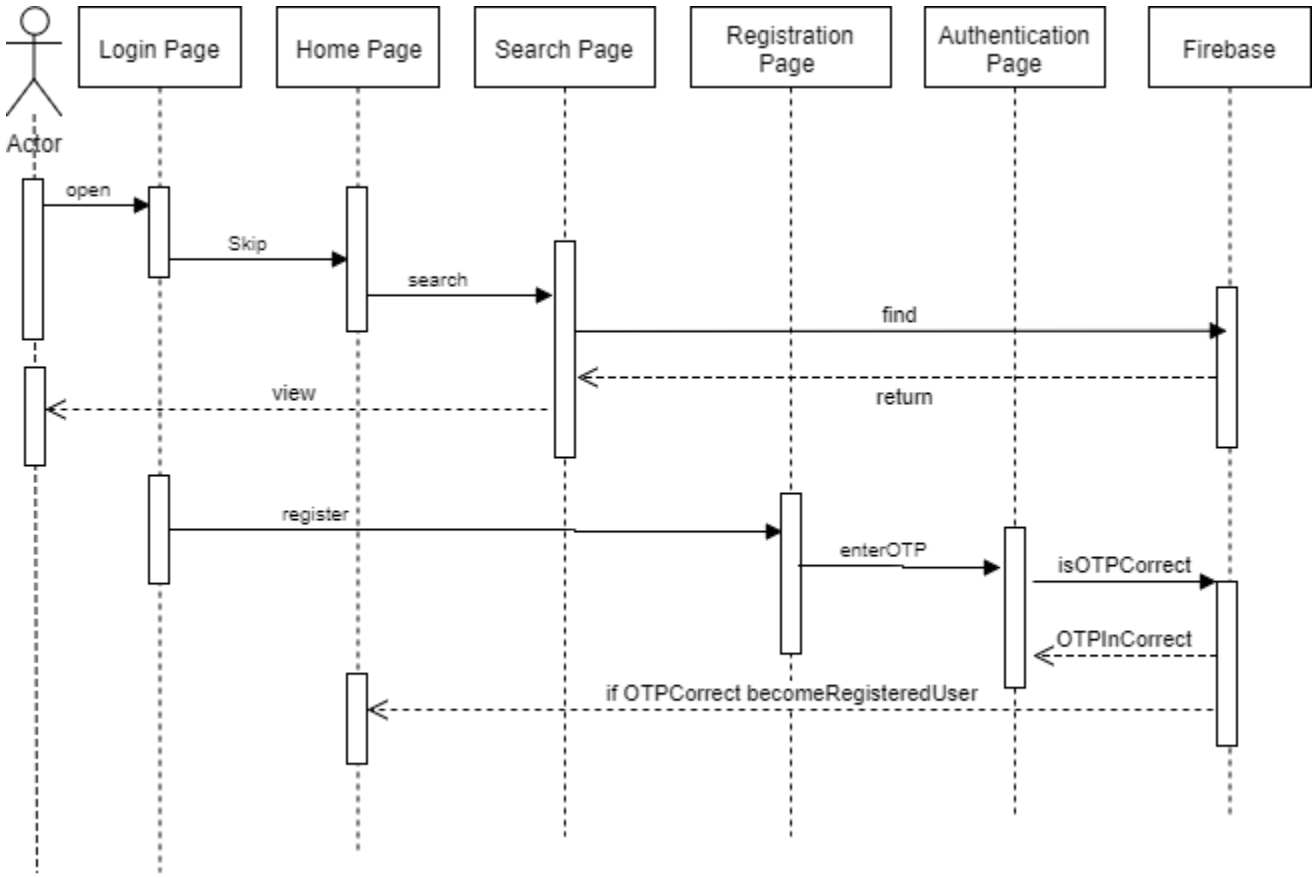
ADMIN



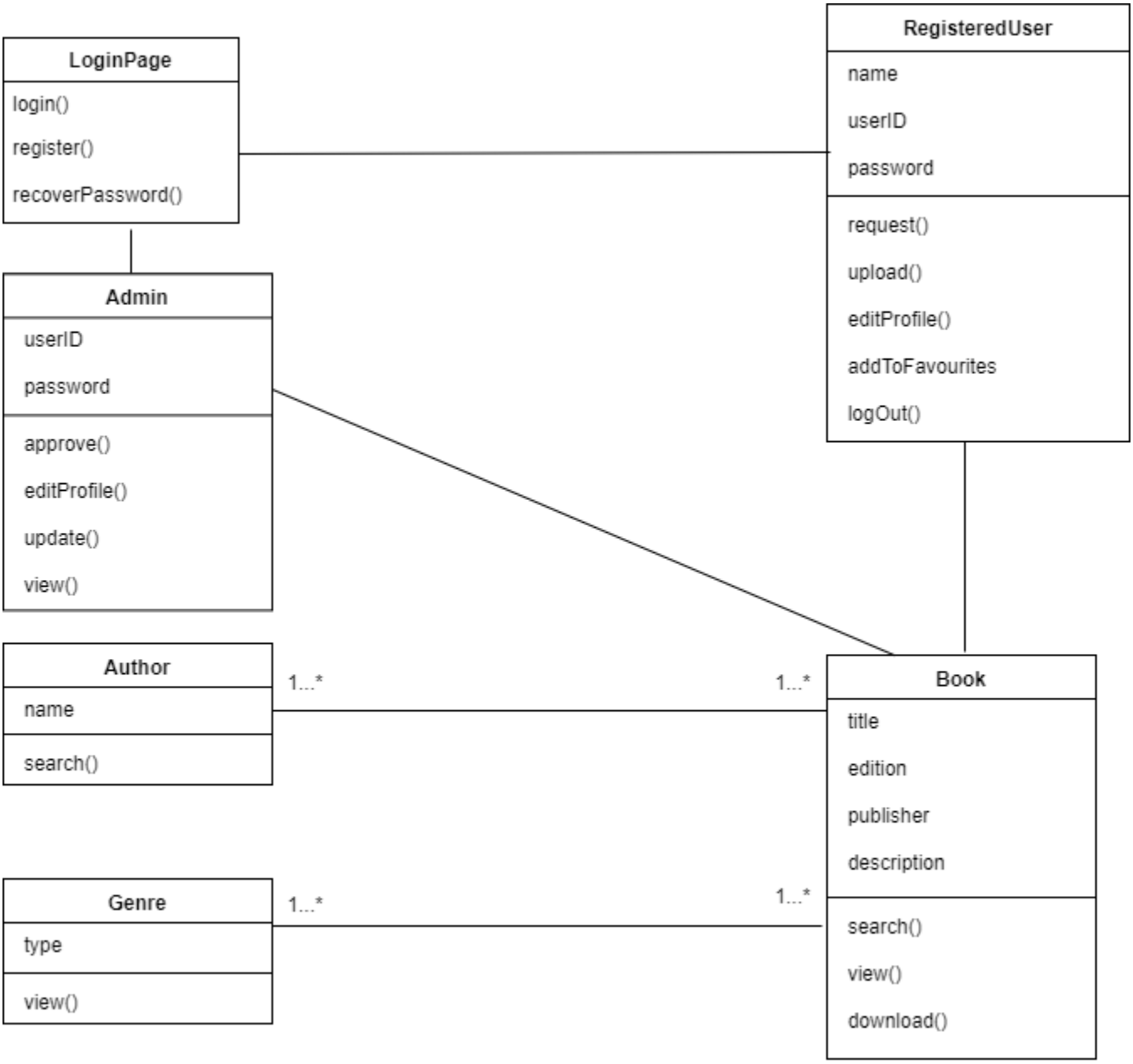
REGISTERED USER



GUEST USER


Actor
Login Page
Home Page
Search Page
Registration Page
Authentication Page
Firebase
open
Skip
search
find
return
view
register
enterOTP
isOTPCorrect
OTPInCorrect
if OTPCorrect becomeRegisteredUser

2.2.3 Class diagram



3. DATA DESIGN

3.1 Database Description

This section explains the proposed database of the system.

3.1.1 USER Data

```
"USER" :
{       "9876543210" :
        {
                "FAVOURITES" : "BOOK3,BOOK5",
                "NAME" : "XXXX",
                "NOTIFICATION" : "XXXX,YYYY",
                "PASSWORD" : "******"
        }
 }
```

3.1.2 ADMIN Data

```
 "ADMIN" :
{
        "1234567890" :
        {
                "PASSWORD" : "****"
         }
}
```

3.1.3 BOOKS Data

```
"BOOKS" :
{
 "BOOK1" :
 {
  "AUTHOR" : "XXXX,YYYY",
  "DESCRIPTION" : "XXXXXX",
  "GENRE" : "XXXX",
  "IMAGES" : ".jpg,.jpg",
  "NAME" : "XXXX",
  "URL" : "XXXXX",
  "VISIBILITY" : "TRUE/FALSE"
 }
}
```

3.1.4 AUTHOR Data

```
"AUTHOR" :
{  "AuthorName" : "BOOK1,BOOK2",
  "AuthorName2" : "BOOK9,BOOK4"
 }
```

3.1.5 GENRE Data

```
"GENRE" :
{
  "GenreName" : "BOOK11,BOOK7",
  "GenreName2" : "BOOK2,BOOK6"
 }
```

4. USER INTERFACE DESIGN

4.1 Detailed Description of Components

Registration Module

Description of Component

This module allows the new user or a guest user to become the member.

Interface Description

Inputs: - All user details required

Outputs:-The successful User register submission page.

Processing Details

- Display the activity containing fields of user details to be filled by user in order to get registered.
- Check whether the information submitted is proper or not and all fields are properly filled or not. The OTP sent is also verified.

Login Module

Description of component

This module allows a registered user or an admin to access the database and their own data. It allows only valid and legitimate users to access the application.

Interface Description

Inputs:-User type, User ID and Password

Outputs:- The Home screen opens.

Processing Details

- Display the form with user type, user ID and password field.
- Mark all the fields as compulsory.
- Check whether the user ID is valid or not, if yes check whether password matches or not.
- Open the home screen after clicking Login button after validation checking.

View Module

Description of components

To display details as well as a part of the book that has been selected.

Interface Description

Inputs: -Book selected

Outputs:- details and images of the book

Processing Details

- Display the list of books with its description.
- User selects a book.
- User is redirected to the interface that displays the images for the selected book.

Download Module

Description of components

This module is used to save the files to the user's device.

Interface Description

Input:- The file to be saved.

Output:-The file is written to device storage

Processing Details

The user selects the file to be downloaded from the list.

Search Module

Description of components

This module is used to search the database. Searching can be done by the registered user and the guest user.

Interface Description

Input:-Information to search (Book name, author name).

Output:-list of files matching the search.

Processing Details

The user will provide the input for search and then a list of items satisfying this list will be visible.

Request Module

Description of components

This module provides facility for the registered users to request a book not present in the database.

Interface Description

Input:-Details of the book to be requested

Processing detail

User fills the details such as book name, authors, publication etc. for the book that he wishes to see in the database

Profile Updation Module

Description of components

This module is used to update the profile information of the user.

Interface Description

Input:- User can change his name and password.

Output:- Updated information.

Processing detail

- User enters the required new information
- Verification and validation is done on input data
- If it is invalid, an error message is displayed
- Otherwise users profile information is updated.

Favorites Module

Description of components

This module allows a user to add a selected book to the favorites list.

Interface Description

Input:-Book to be marked.

Output:-Bookmarked symbol showing that the book has been marked.

Processing Details

User can view a book and then mark it if he wishes to(for future reference)

Upload Module

Description of components

This module is used to allow the user to upload document to the database.

Interface Description

Input:-The file to be uploaded and its description.

Output:-Message displaying success/failure.

Processing Details

The user will enter the details of the book in the given form. The user will also select the book to be uploaded.

Password Recovery Module

Description of components

This module is used by the registered user to recover his password he forgets.

Interface Description

Input:-User phone number

Output:-Changed Password.

Processing Details

- User will enter his phone number.
- An OTP will be sent on the number registered
- The user will be allowed to change his password.

Add/Delete Module

Description of components

This module is used by admin to approve/disapprove the books uploaded by the user. Approving the book will add it to the library whereas disapproving it will delete the book from database.

Interface Description

Input:-Books uploaded.

Output:-Adding or deleting the book(s).

Processing Details

Admin is shown a list of uploaded books and can select the books that he approves, delete the books that he disapproves.

Log Out Module

Description of components

This module allows the registered user and admin to log out of the application.

Interface Description

Input:- user ID.

Output:-the user is logged out of the system.

Processing Details

User clicks on the logout button and a message is displayed if he is logged out successfully.

Notification Module

Description of components

This module notifies the user of any books added to the system.

Interface Description

A notification to each registered user.

Processing Details

User clicks on the notification button and the notification(s) are displayed.

4.2 Screen images

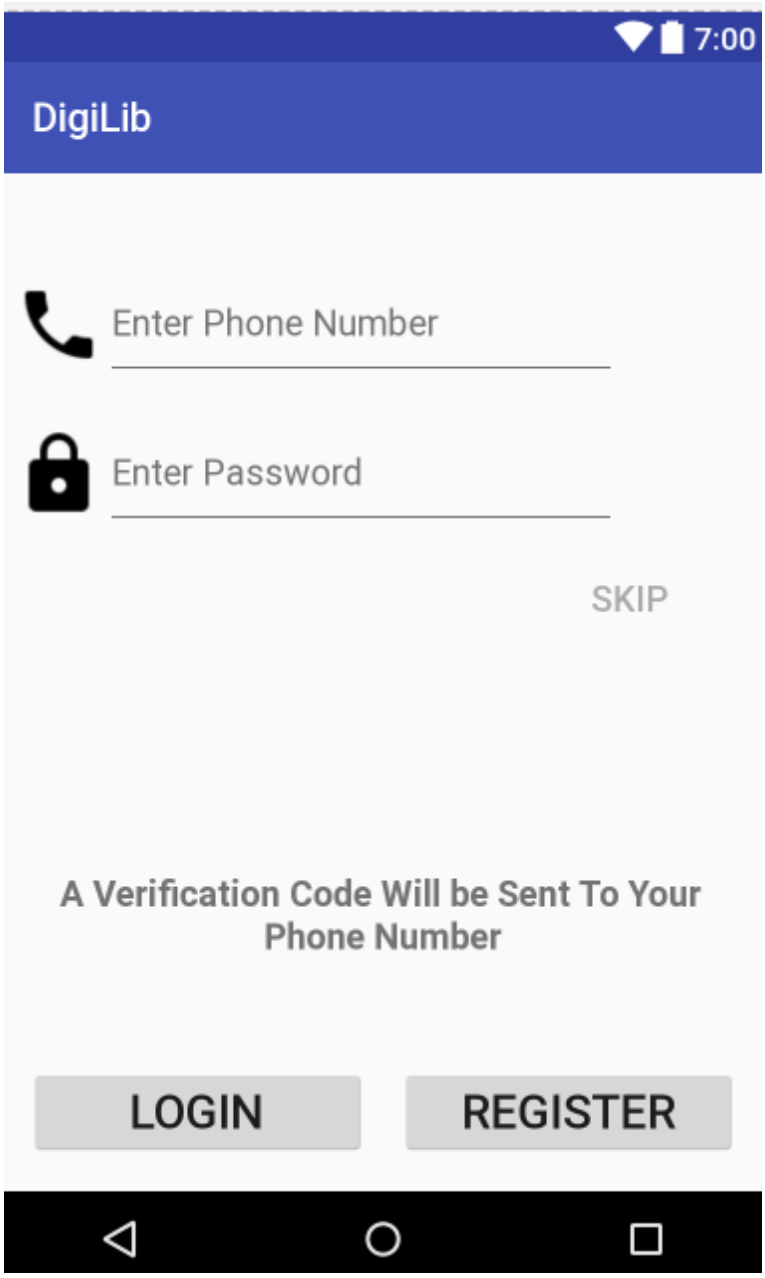


Fig: The Login Page

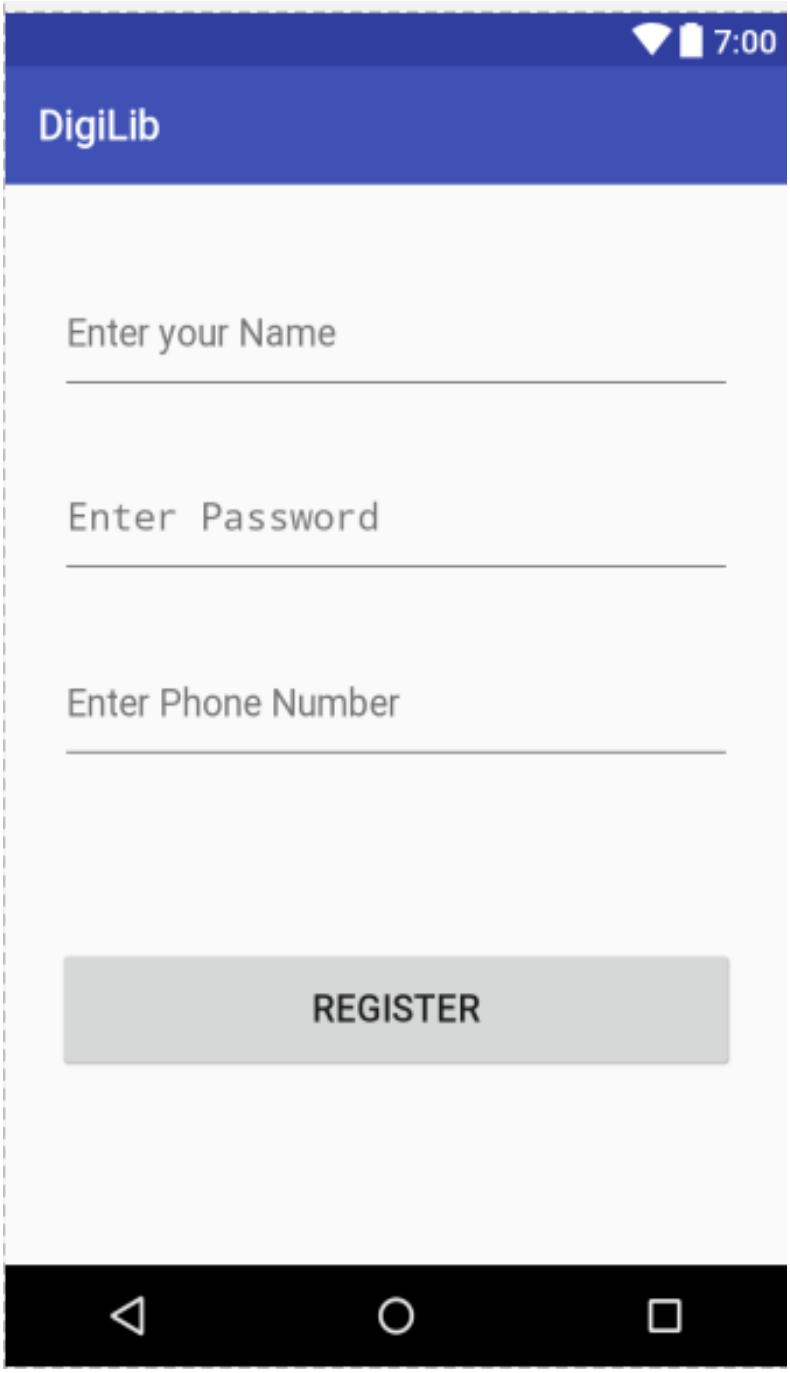


Fig: The Registration Page

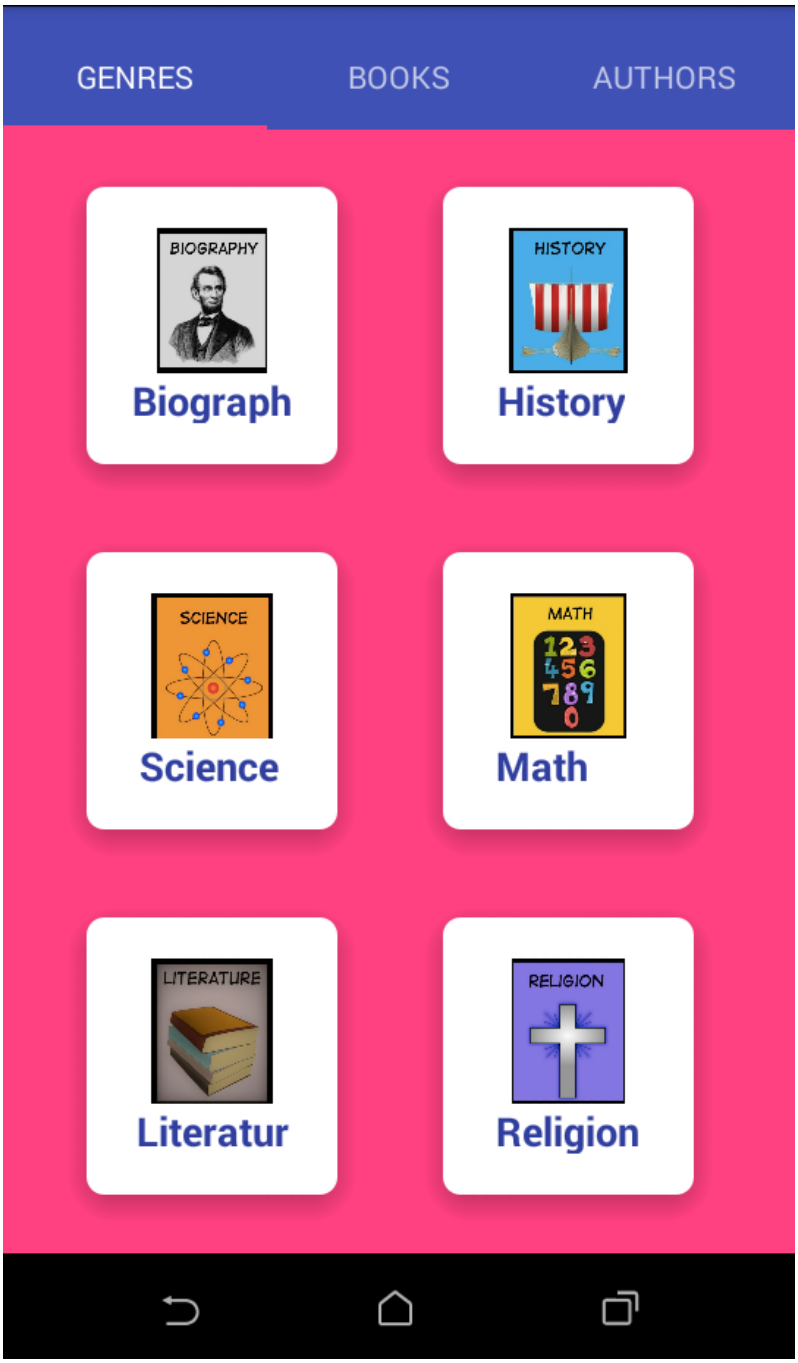


Fig: The Home Page

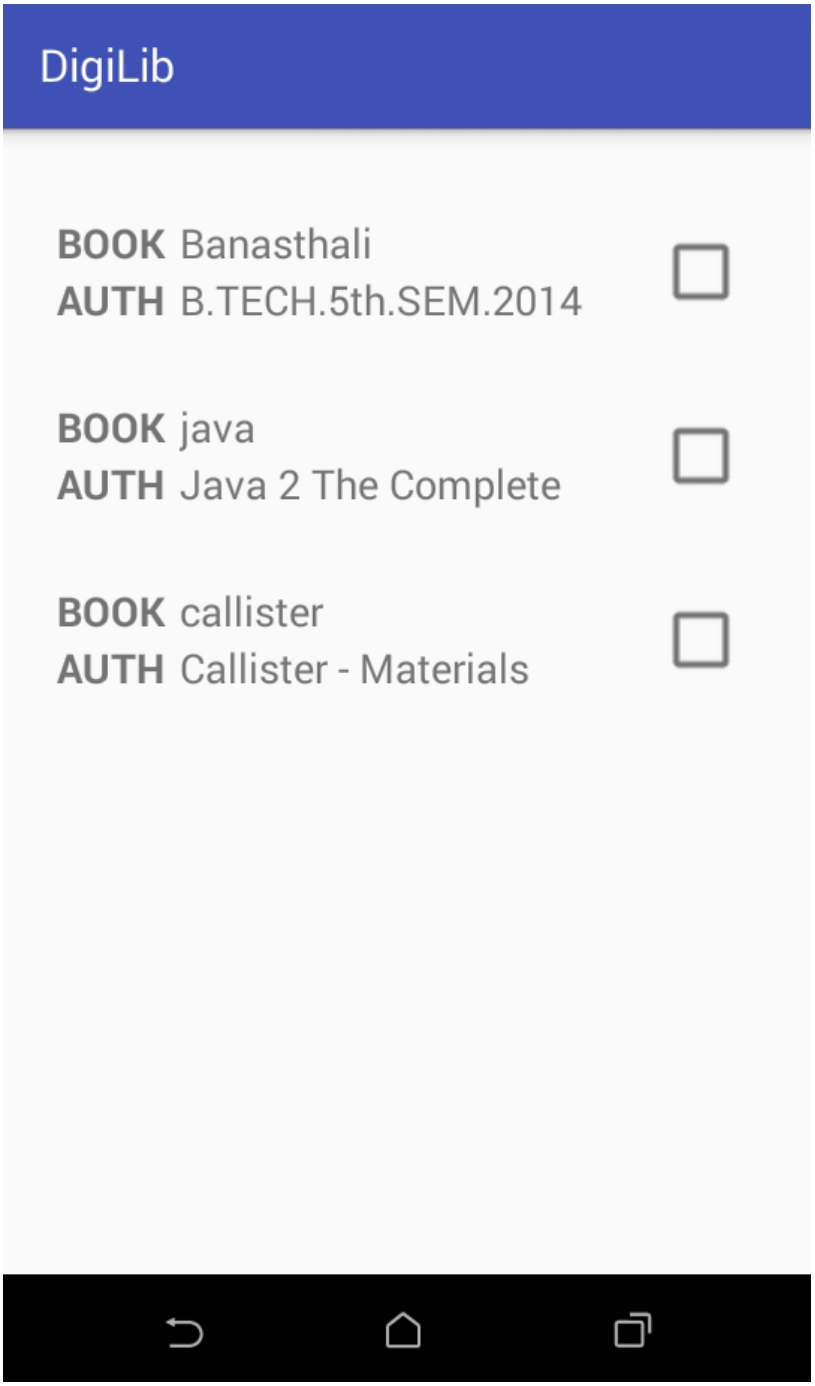


Fig: Books for Approval by Admin

5.TESTING ISSUES

The following type of testing has been used in our project:

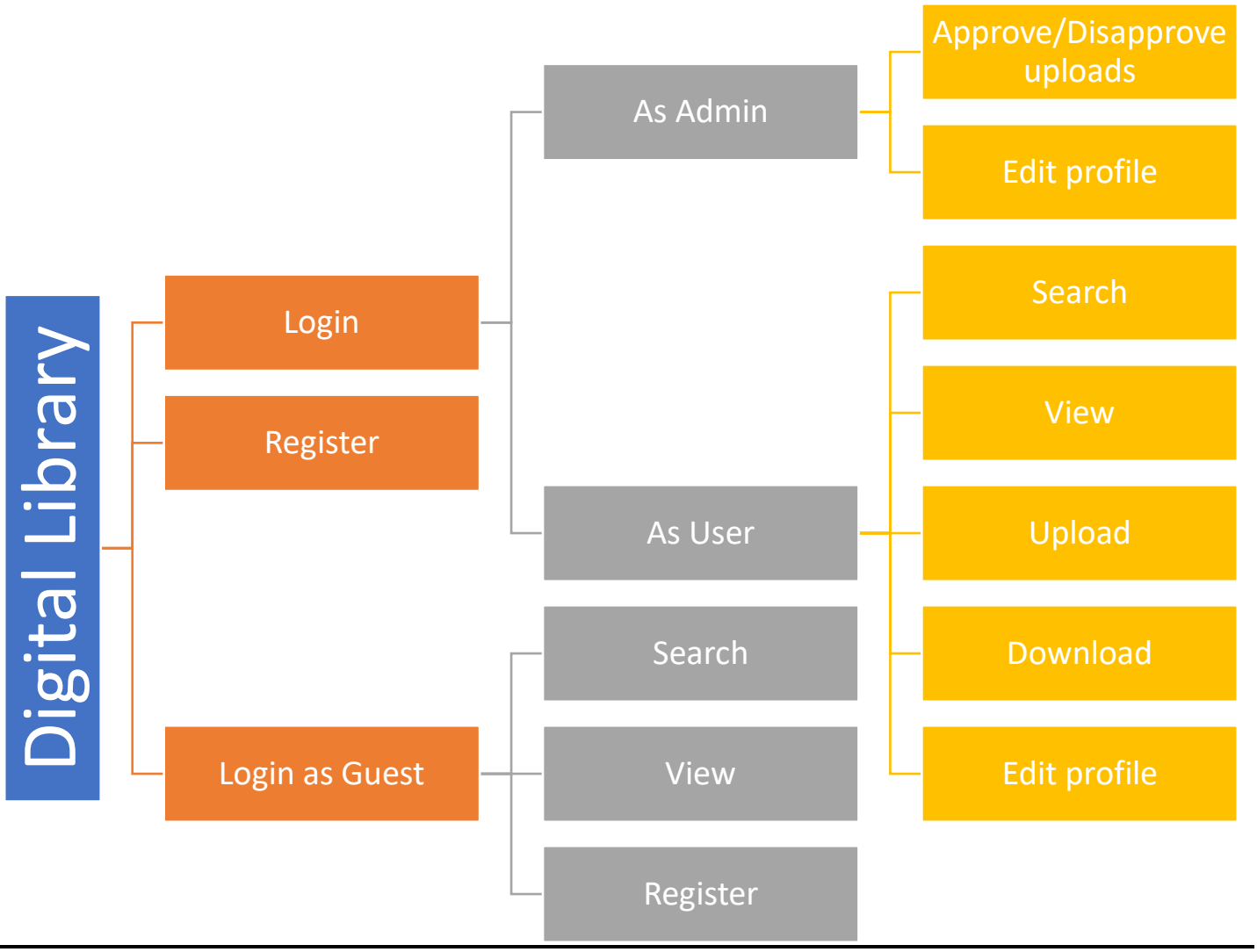
5.1 Unit Testing:-This test is applied on each of the module to find whether or not each module is properly working or not

5.2 Integration Testing: - After each module cleared the unit testing then modules is tested for their working all together in the integrated testing phase.

5.3 Acceptance Testing: - This testing provides the final assurance that the application needed all behavioral and performance requirements.

6.APPENDIX

6.1 Structure Chart:



6.2 Firebase Interface: