

# **LIBRARY MANAGEMENT SYSTEM**

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In Partial Fulfillment of the Requirements  
for the Degree of**

## **MASTER OF COMPUTER APPLICATIONS**

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**To the**

**FACULTY OF COMPUTER APPLICATIONS**  
**DR. APJ ABDUL KALAM TECHNICAL UNIVERSITY**  
**LUCKNOW**  
(Formerly Uttar Pradesh Technical University, Lucknow)

**January, 2022**

## **DECLARATION**

I hereby declare that the work presented in this report entitled "LIBRARY MANEGMENT SYSTEM", was carried out by me. I have not submitted the matter embodied in this report for the award of any other degree or diploma of any other University or Institute.

I have given due credit to the original authors/sources for all the words, ideas, diagrams, graphics, computer programs, experiments, results, that are not my original contribution. I have used quotation marks to identify verbatim sentences and given credit to the original authors/sources.

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Certified that **Shashank Mishra** (University Roll No: 1900290140032) has carried out the project work presented in this thesis entitled “**Library Management System**” for the award of **Master of Computer Applications** from Dr. APJ Abdul Kalam Technical University, Lucknow under my/our supervision. The project embodies results of original work, and studies are carried out by the student himself/herself and the contents of the project do not form the basis for the award of any other degree to the candidate or to anybody else from this or any other University/Institution.

Signature of Project Mentor

(Name of Mentor)

Signature of Internal Examiner

(Name of Supervisor)

(Designation)

Signature of External Examiner: -

Date:

## **ABSTRACT**

Library Management System is a project which aims in developing a computerized system to maintain all the daily work of library. This project has many features which are generally not available in normal library management systems like facility of user login and a facility of teacher's login. It also has a facility of admin login through which the admin can monitor the whole system. It has also a facility where student after logging in their accounts can see list of books issued and its issue date and return date and also the students can request the librarian to add new books by filling the book request form. The librarian after logging into his account i.e., admin account can generate various reports such as student report, issue report, teacher report and book report.

Overall, this project of ours is being developed to help the students as well as staff of library to maintain the library in the best way possible and also reduce the human efforts.

## **AKNOLEDGEMENT**

First and foremost, I would like to thank our Project Mentor/Teacher Dr. Amit K. Gupta Sir and Dr. Naresh Chandra Sir who guided us in doing these projects. He provided us with invaluable advice and helped us in difficult periods. His motivation and help contributed tremendously to the successful completion of the project.

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Also I would like to thank my friends/Project Members for their support. Without that support we couldn't have succeeded in completing this project.

At last but not in least, we would like to thank everyone who helped and motivated us to work on this project.

Name:

Place:

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# **CHAPTER 1**

## **1. INTRODUCTION**

### **INTRODUCTION:**

With the increase in the number of readers, better management of libraries system is required. The library management system focuses on improving the management of libraries in a city or town. “What If you can check whether a book is available in the library through your phone ?” or “what if instead of having different library cards for different libraries you can just have one?” or “you can reserve a book or issue a book from your phone sitting at your home!”. The Integrated Library Management system provides you the ease of issuing, renewing, or reserving a book from a library within your town through your phone. The Integrated Library Management system is developed on the android platform which basically focuses on issuing, renewing and reserving a book.

### **1.1 PURPOSE**

The purpose of the project is to maintain the details of books and library members of different libraries. The main purpose of this project is to maintain a easy circulation system between clients and the libraries, to issue books using single library card, also to search and reserve any book from different available libraries and to maintain details about the user (fine, address, phone number). Moreover, the user can check all these features from their home.

### **1.2 SCOPE**

- Manually updating the library system into an android based application so that the user can know the details of the books available and maximum limit on borrowing from their computer and also through their phones.
- The LM System provides information's like details of the books, insertion of new books, deletion of lost books, limitation on issuing books, fine on keeping a book more than one month from the issued date.
- Also, user can provide feedback for adding some new books to the library



## **CHAPTER 2**

### **2.SYSTEM ANALYSIS**

#### **2.1 FUNCTIONAL REQUIREMENT**

##### **➤ Register**

- Description: First the user will have to register/sign up. There are two different type of users.
- The library manager/head: The manager have to provide details about the name of library, address, phone number, email id.
- Regular person/student: The user has to provide details about his/her name of address, phone number, email id.

##### **Sign up**

- Input: Detail about the user as mentioned in the description.
- Output: Confirmation of registration status and a membership number and password will be generated and mailed to the user.
- Processing: All details will be checked and if any error is found then an error message is displayed else a membership number and password will be generated.

##### **Login**

- Input: Enter the membership number and password provided.
- Output: User will be able to use the features of software.

##### **➤ Manage books by user.**

##### **Books issued.**

- Description: List of books will be displaced along with data of return.

## **Search**

- Input: Enter the name of author's name of the books to be issued.
- Output: List of books related to the keyword.

## **Issues book**

- State: Searched the book user wants to issues.
- Input: click the book user wants.
- Output: conformation for book issue and apology for failure in issue.
- Processing: if selected book is available then book will be issued else error will be displayed.

## **Renew book**

- State: Book is issued and is about to reach the date of return.
- Input: Select the book to be renewed.
- Output: conformation message.
- Processing: If the issued book is already reserved by another user then error message will be send and if not then conformation message will be displayed.

## **Return**

- Input: Return the book to the library.
- Output: The issued list will be updated and the returned book will be listed out.

## **Reserve book**

- Input: Enter the details of the book.
- Output: Book successfully reserved.
- Description: If a book is issued by someone then the user can reserve it, so that later the user can issue it.

## **Fine**

- Input: check for the fines.
- Output: Details about fines on different books issued by the user.
- Processing: The fine will be calculated, if it crossed the date of return and the user did not renew if then fine will be applied by Rs 10 per day.

## ➤ **Manage book by librarian**

### **Update details of books**

#### **Add books**

- Input: Enter the details of the books such as names, author, edition, quantity.
- Output: confirmation of addition.

#### **Remove books**

- Input: Enter the name of the book and quantity of books.
- Output: Update the list of the books available ted, the project "Online Voting" provides means for fast and convenient voting and access to this system is limited only to registered voters.

## 2.2 NON-FUNCTIONAL REQUERMENTS

### ➤ **Usability Requirement**

The system shall allow the users to access the system from the phone using android application. The system uses a android application as an interface. Since all users are familiar with the general usage of mobile app, no special training is required. The system is user friendly which makes the system easy.

### ➤ **Availability Requirement**

The system is available 100% for the user and is used 24 hrs. a day and 365 days a year. The system shall be operational 24 hours a day and 7 days a week.

### ➤ **Efficiency Requirement**

Mean Time to Repair (MTTR) - Even if the system fails, the system will be recovered back up within an hour or less.

### ➤ **Accuracy**

The system should accurately provide real time information taking into consideration various concurrency issues. The system shall provide 100% access reliability.

### ➤ **Performance Requirement**

The information is refreshed depending upon whether some updates have occurred or not in the application. The system shall respond to the member in not less than two seconds from the time of the request submittal. The system shall be allowed to take more time when doing large processing jobs. Responses to view information shall take no longer than 5 seconds to appear on the screen.

➤ **Reliability Requirement**

The system has to be 100% reliable due to the importance of data and the damages that can be caused by incorrect or incomplete data. The system will run 7 days a week, 24 hours a day.

## **2.3 FEASIBILITY STUDY**

In Software Engineering is a study to evaluate feasibility of proposed project or system. Feasibility study is one of stage among important four stages of Software Project Management Process. As name suggests feasibility study is the feasibility analysis or it is a measure of the software product in terms of how much beneficial product development will be for the organization in a practical point of view. Feasibility study is carried out based on many purposes to analyse whether software product will be right in terms of development, implantation, contribution of project to the organization etc.

Types of Feasibility Study:

The feasibility study mainly concentrates on below five mentioned areas. Among these Economic Feasibility Study is most important part of the feasibility analysis and Legal Feasibility Study is less considered feasibility analysis.

### **1. Technical Feasibility –**

In Technical Feasibility current resources both hardware software along with required technology are analyzed/assessed to develop project. This technical feasibility study gives report whether there exists correct required resources and technologies which will be used for project development. Along with this, feasibility study also analyzes technical skills and capabilities of technical team, existing technology can be used or not, maintenance and up-gradation is easy or not for chosen technology etc.

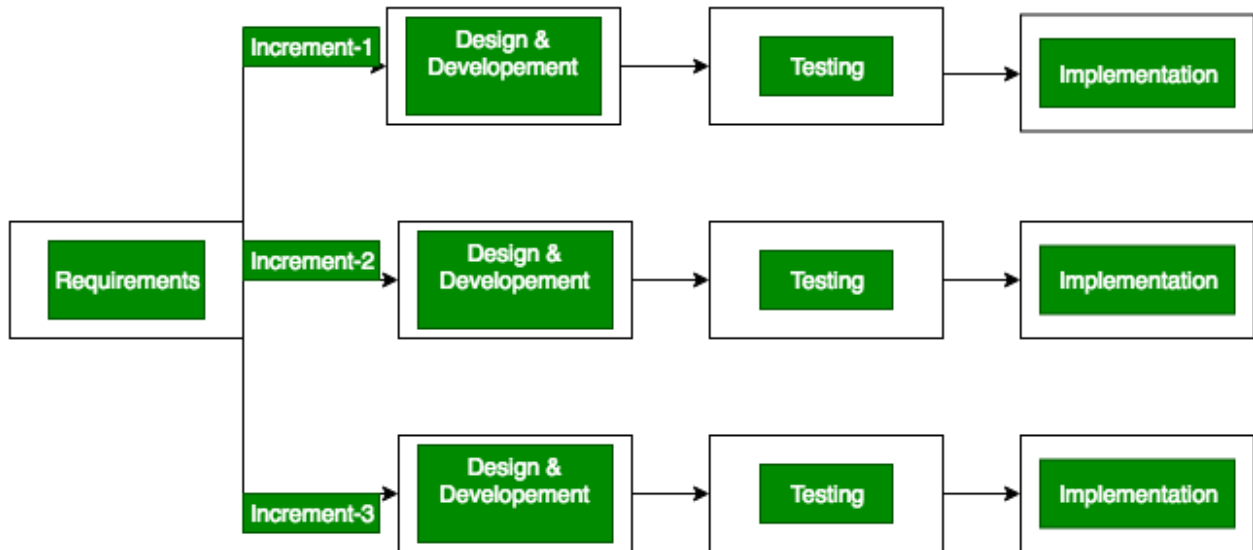
### **2. Operational Feasibility –**

In Operational Feasibility degree of providing service to requirements is analyzed along with how much easy product will be to operate and maintenance after deployment. Along with these other operational scopes are determining usability of product, determining suggested solution by software development team is acceptable or not etc.

### **3. Economic Feasibility –**

In Economic Feasibility study cost and benefit of the project is analyzed. Means under this feasibility study a detail analysis is carried out what will be cost of the project for development which includes all required cost for final development like hardware and software resource required, design and development cost and operational cost and so on. After that it is analyzed whether project will be beneficial in terms of finance for organization or not.

## 2.4 MODEL USED: INCREMENTAL MODEL: -



Incremental Model is a process of software development where requirements divided into multiple standalone modules of the software development cycle. In this model, each module goes through the requirements, design, implementation and testing phases. Every subsequent release of the module adds function to the previous release. The process continues until the complete system achieved.

## **2.5 SOFTWARE & HARDWARE REQUIREMET**

### **➤ Software Requirements: -**

#### **Front end:**

- Android developer tool
- Advance java

#### **Back end:**

- MySQL

### **➤ Hardware Requirements: -**

- Android version 2.3 ginger bread (minimum, android user's)
- 8GB RAM
- 1.2 GHz processor
- Intel i5
- Windows 7/8/8.1/10



## **2.6 EXISTING VS PROPOSED SYSTEM:**

### **Existing System: -**

- Early days Libraries are managed manually. It required lot of time to record or to retrieve the details. The employees who have to record the details must perform their job very carefully. Even a small mistake would create a lot of problems. Security of information is very less. Report generations of all the information is very tough task.
- Maintenance of Library catalogue and arrangement of the books to the catalogue is very complex task. In addition to its maintenance of member details, issue dates and return dates etc. manually is a complex task.
- All the operations must be performed in perfect manner for the maintenance of the library without any degradation which may finally result in the failure of the entire system.

### **Proposed System: -**

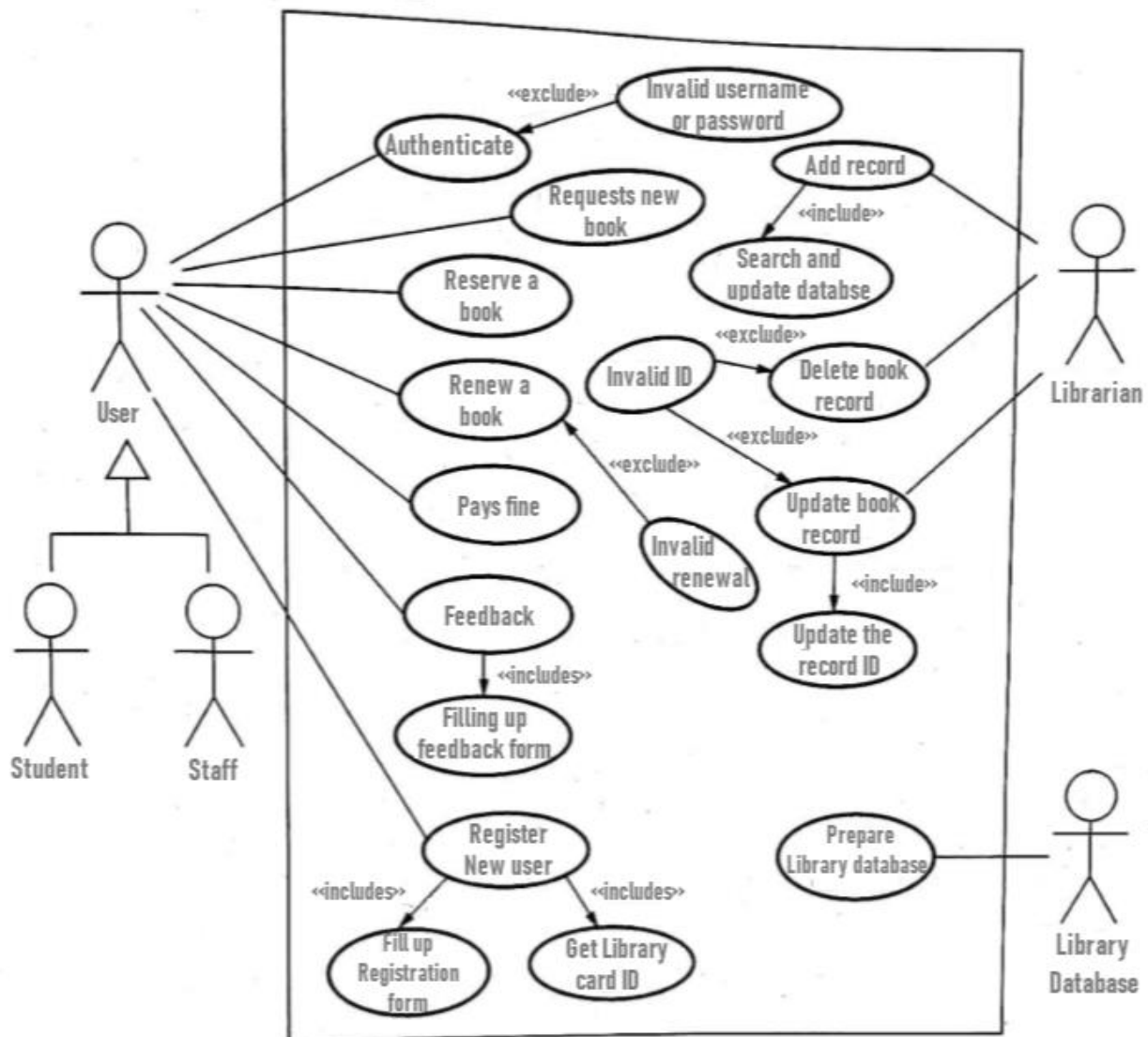
To solve the inconveniences as mentioned in the existing system, an Online Library is proposed. The proposed system contains the following features:

- The students will register them through Online
- Individually each member will have his account through which he can access the information he needs.
- Book details like authors, number of copies totally maintained by library, present available number of books, reference books, non-reference books etc. all this information can be made handy.
- Issue dates and returns of each member is maintained separately and fine charged if there is any delay in returning the book.
- Administrator can add, update the books.
- Time consuming is low, gives accurate results, reliability can be improved with the help of security.

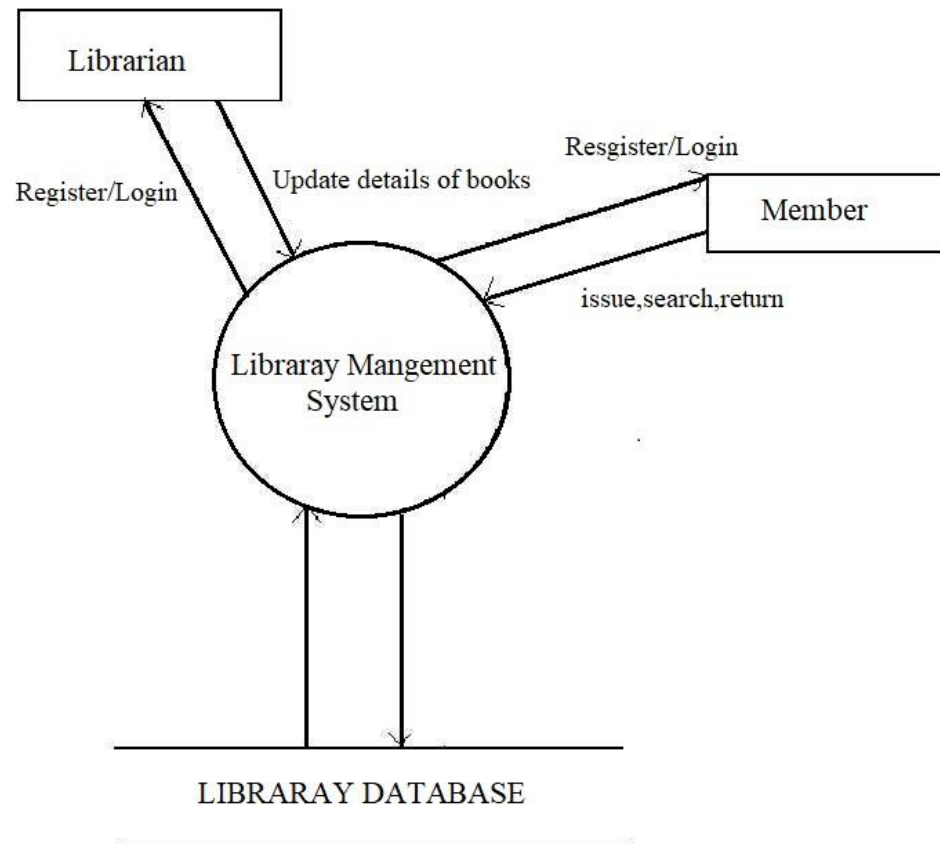
## CHAPTER 3

### 3.SYSTEM DESIGN

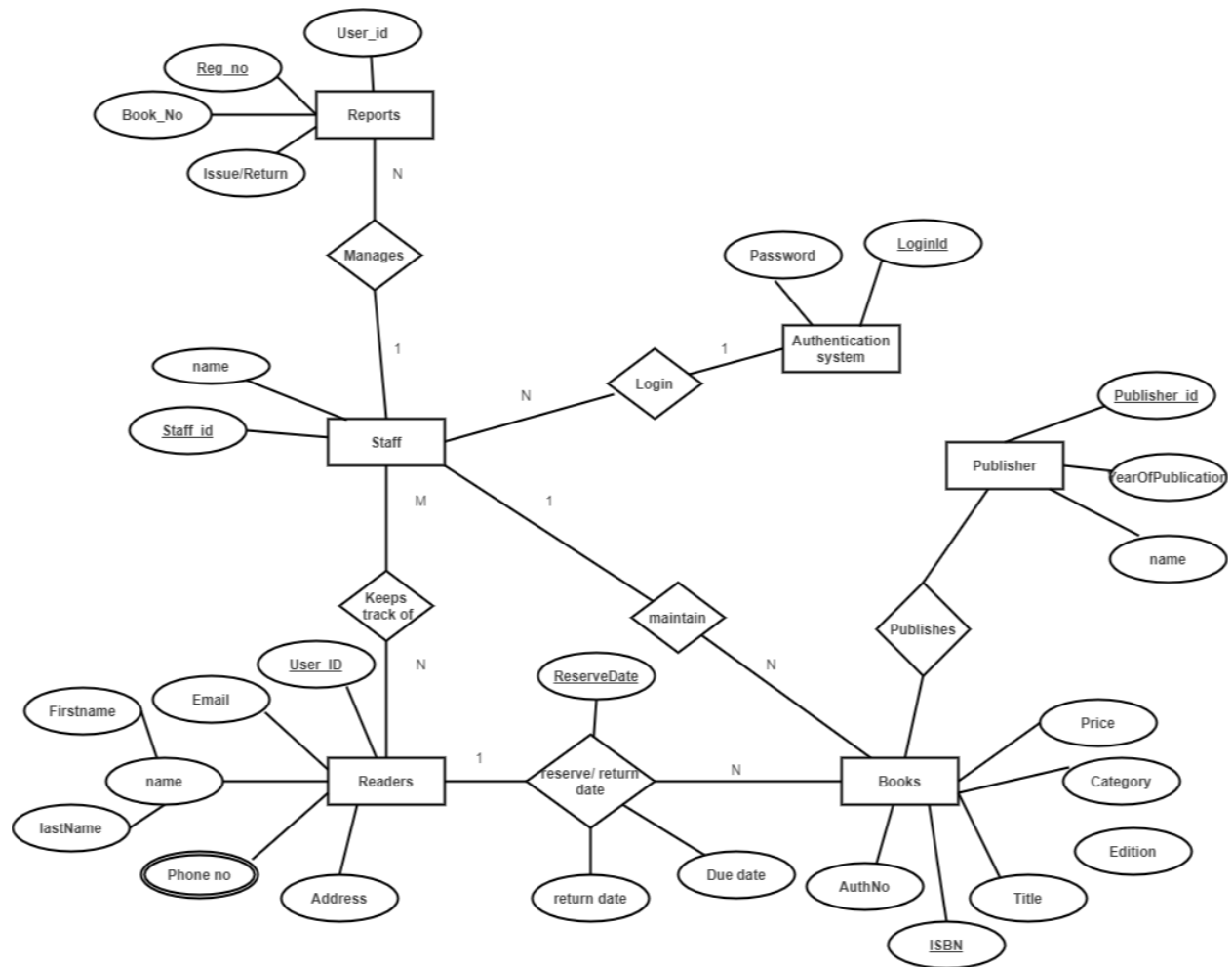
#### ➤ 3.1 USE CASE DIGRAM



### ➤ 3.2 DATA FLOW DIAGRAM



### ➤ 3.3 ENTITY RELATIONSHIP DIAGRAM



## **CHAPTER 4**

### **4.SYSTEM IMPLEMENTATION**

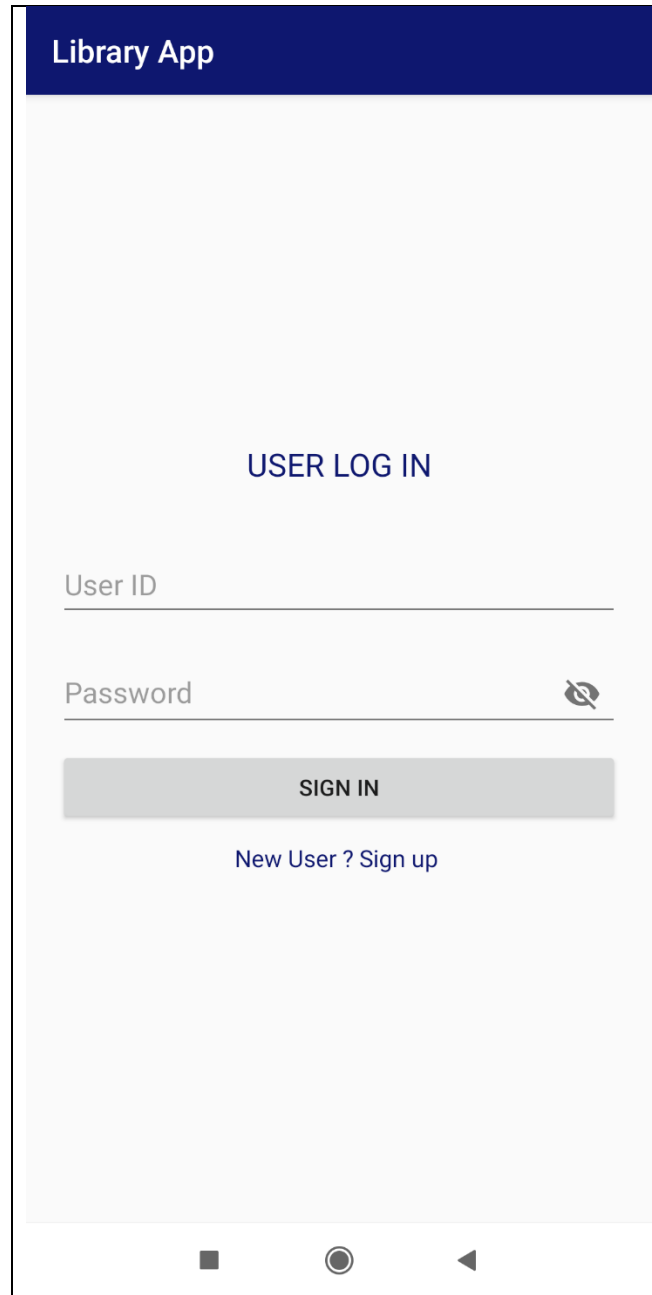
#### **4.1 MODULE DESCRIPTION**

We have 3 levels of users:

- **User module:** In the user module, user will check the availability of the books.
  - Issue book
  - Reserve book
  - Return book
  - Fine details
- **Librarian module:**
  - Book issue
  - Add new book
  - Remove books
  - Update details of book
- **Administration module:** The following are the sub module in the administration module:
  - Register librarian
  - Entry book details





## 4.2 SNAPSHOT

➤ **Login Page:**

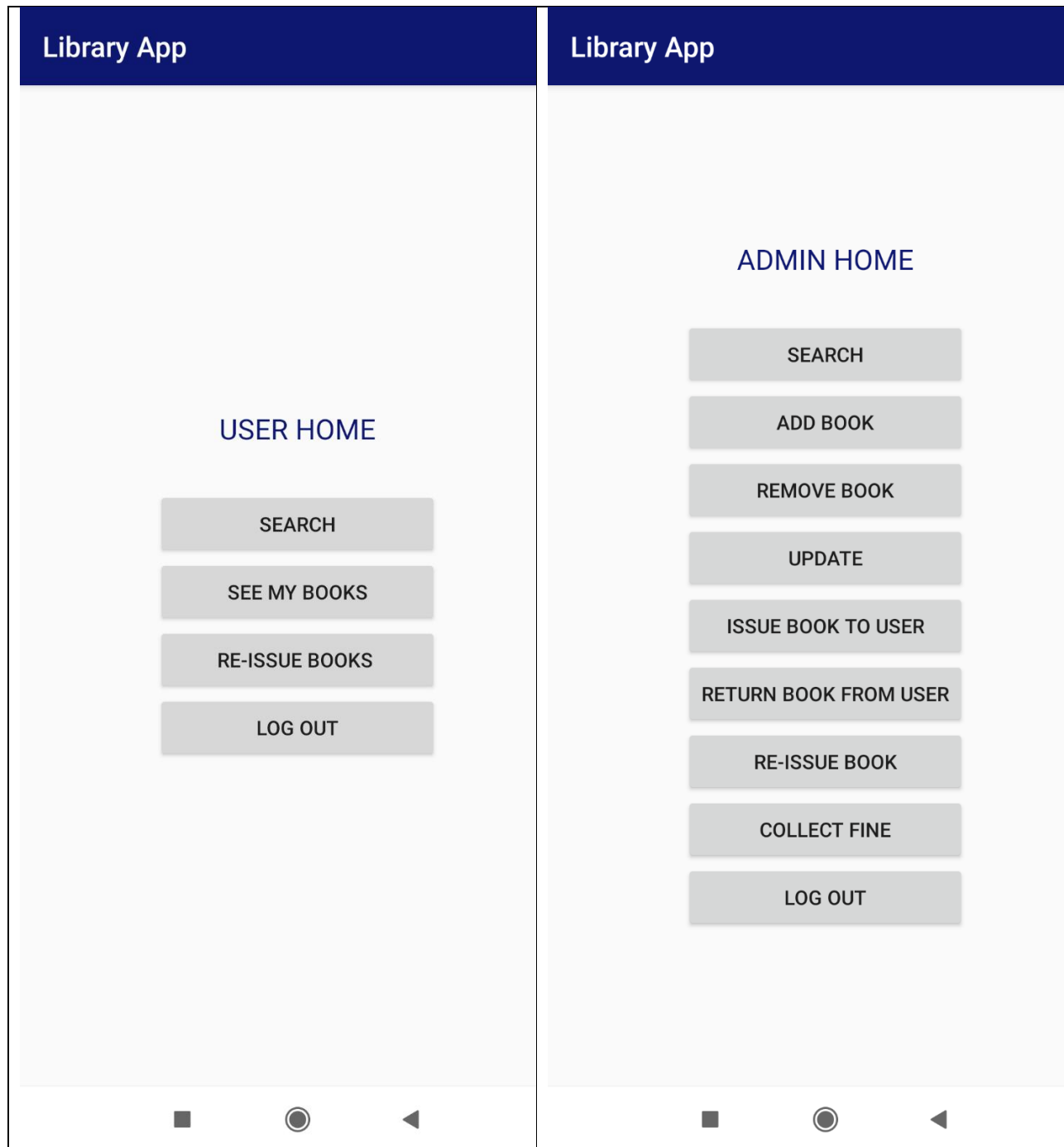


The screenshot displays the login interface of the 'Library App'. At the top, a dark blue header bar contains the text 'Library App' in white. The main content area is light gray and features the title 'USER LOG IN' in dark blue. Below the title are two input fields: 'User ID' and 'Password'. The 'Password' field includes a toggle icon (an eye with a diagonal line) to the right. A gray 'SIGN IN' button is positioned below the password field. At the bottom of the form, there is a link that reads 'New User ? Sign up'. The entire app interface is framed by a black border, and the bottom of the screen shows standard Android navigation icons (a square, a circle, and a triangle).

**User/Admin Register Page: -**

Library App	Library App
<p>USER REGISTRATION</p> <p>User ▼</p> <p>Name</p> <p>Enrollment No.</p> <p>Library Card No.</p> <p>Email ID</p> <p>Password </p> <p>Confirm Password </p> <p><input type="checkbox"/> I Agree that the information provided is correct</p> <p>REGISTER</p> <p>Already Registered ? Sign in</p>	<p>USER REGISTRATION</p> <p>Admin ▼</p> <p>Name</p> <p>Enrollment No.</p> <p>Library Card No.</p> <p>Email ID</p> <p>Password </p> <p>Confirm Password </p> <p><input type="checkbox"/> I Agree that the information provided is correct</p> <p>REGISTER</p> <p>Already Registered ? Sign in</p>

**User Home/Admin Home: -**





**Add/Remove Book: -**

Library App	Library App
<p>ADD BOOK</p> <p>ID <input type="text"/></p> <p>Title <input type="text"/></p> <p>Select Book Category <input type="text"/></p> <p>No. of Units <input type="text"/></p> <p>ADD</p>	<p>REMOVE BOOK</p> <p>Book ID <input type="text"/></p> <p>FIND</p>

**Issue/Update Book: -**

Library App	Library App
<p>ISSUE BOOK</p> <p>Book ID</p> <hr/> <p>Card No.</p> <hr/> <p>ISSUE</p>	<p>UPDATE BOOK</p> <p>ID</p> <hr/> <p>Title</p> <hr/> <p>Select Book Category</p> <p>No. of Units</p> <hr/> <p>UPDATE</p>

**Search/Return Book: -**

Library App	Library App
<p>SEARCH BOOK</p> <p>ID <input type="text"/></p> <p>Title <input type="text"/></p> <p>Select Book Category <input type="text"/></p> <p><input type="checkbox"/> Show only available books</p> <p>GO</p>	<p>RETURN BOOK</p> <p>Book ID <input type="text"/></p> <p>Card No. <input type="text"/></p> <p>RETURN</p>

## **CHAPTER 5**

### **5.SYSTEM TESTING**

The aim of the system testing process was to determine all defects in our project. The program was subjected to a set of test inputs and various observations were made and based on these observations it will be decided whether the program behaves as expected or not. Our Project went through two levels of testing

1. Unit testing
2. integration testing

#### **5.1 UNIT TESTING**

Unit testing is undertaken when a module has been created and successfully reviewed. In order to test a single module, we need to provide a complete environment i.e., besides the module we would require

- The procedures belonging to other modules that the module under test calls
- Non local data structures that module accesses
- A procedure to call the functions of the module under test with appropriate parameters

##### **1. Test For the admin module**

- Testing admin login form-This form is used for log in of administrator of the system. In this we enter the username and password if both are correct administration page will open otherwise if any of data is wrong it will get redirected back to the login page and again ask for username and password
- Student account addition- In this section the admin can verify student details from student academics info and then only add student details to main library database it contains add and delete buttons if user click add button data will be added to student database and if he clicks delete button the student data will be deleted
- Book Addition- Admin can enter details of book and can add the details to the main book table also he can view the books requests.

##### **2. Test for Student login module**

- Test for Student login Form-This form is used for log in of Student. In this we enter the library id, username and password if all these are correct student login page will open otherwise if any of data is wrong it will get redirected back to the login page and again

ask for library Id, username and password.

- Test for account creation- This form is used for new account creation when student does not fill the form completely it asks again to fill the whole form when he fills the form fully it gets redirected to page which show waiting for conformation message as his data will be only added by administrator after verification.

### 3. Test for teacher login module

- Test for teacher login form- This form is used for log in of teacher. In this we enter the username and password if all these are correct teacher login page will open otherwise if any of data is wrong it will get redirected back to the login page and again ask for username and password.

## 5.2 INTEGRATION TESTING

In this type of testing, we test various integration of the project module by providing the input. The primary objective is to test the module interfaces in order to ensure that no errors are occurring when one module invokes the other module.

## **CHAPTER 6**

### **6.CONCLUSION & FUTURE SCOPE**

#### **6.1 CONCLUSION**

This android app provides a computerized version of library management system which will benefit the students as well as the staff of the library. It makes entire process online where student can search books, staff can generate reports and do book transactions. It also has a facility for student login where student can login and can see status of books issued as well request for book or give some suggestions. It has a facility of teacher's login where teachers can add lectures notes and also give necessary suggestion to library and also add info about workshops or events happening in our college or nearby college in the online notice board.

#### **6.2 FUTURE SCOPE**

There is a future scope of this facility that many more features such as online lectures video tutorials can be added by teachers as well as online assignments submission facility, a feature of group chat where students can discuss various issues of engineering can be added to this project thus making it more interactive more user friendly and project which fulfills each users need in the best way possible.

## **CHAPTER 7**

### **7.REFERENCES**

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