COVER PAGE

Institute Name : Besant Technologies

Project Name : Library Management System

Submitted To : Besant Technologies

Submitted By : Narsing Joshna

Co-ordinator Name : Roshiga

Date of Submission : 29-07-2025

TABLE OF CONTENTS

ABSTRACT

Library Management System is a system which maintains the information about the books present in the library, their authors, the members of library to whom books are issued, library staff and all. This is very difficult to organize manually. Maintenance of all this information manually is a very complex task. It reduces the workload of management as most of the manual work done is reduced

The management system is an application for assisting a librarian in managing a book library in a college. The system would provide a basic set of features to add/update members, add/update books, and manage check-in specifications for the systems based on the client's statement of need.

Library management system is a typical management information system, its development includes the establishment and maintenance of back-end database and front-end application development aspects. The former require the establishment of data consistency and integrity of strong data security and good libraries. The latter requires the application to be fully functional, easy to use and so on. The purpose of the system is mainly to provide automation to the library.

INTRODUCTION

This chapter gives an overview about the aim, objectives, background and operation environment of the system.

1.1 PROJECT AIMS AND OBJECTIVES

The project aims and objectives that will be achieved after completion of this project are discussed in this sub-chapter.

The aims and objectives are as follows:

- Online book reading.
- A search column to search availability of books.
- Facility to download required books.
- Video tutorial for students.

An Admin login page where admin can add books, videos or page sources Open link for Learning Websites

1.2 BACKGROUND OF PROJECT

E-Library Management System is an application which refers to library systems which are generally small or medium in size. It is used by librarians to manage the library using a computerized system where he/she can add new books, videos and Page sources. Books and student maintenance modules are also included in this system which would keep track of the students using the library and also a detailed description about the books a library contains. With this computerized system there will be no loss of book record or member record which generally happens when a non-computerized system is used. All these modules are able to help librarian to manage the library with more convenience and in a more efficient way as compared to library systems which are not computerized

1.3 OPERATION ENVIRONMENT

1. System – I3 / Intel Processor

Developed and manufactured by Intel, and first introduced and released in 2010, the Core i3 is a dual-core computer processor, available for use in both desktop and laptop computers. It is one of three types of processors in the "i" series (also called the Intel Core family of processors). The Core i3 processor is available in multiple speeds, ranging from 1.30 GHz up to 3.50 GHz, and features either 3 MB or 4 MB of cache. It utilizes either the LGA 1150 or LGA 1155 socket on a motherboard. Core i3 processors are most often found as dual-core, having two cores. However, A select few high-end Core i3 processors are quad-core, featuring four cores.

2. RAM – 8GB (minimum)

RAM stands for “Random Access Memory”, it’s the physical part of the computer where it temporarily stores data for use by software. It’s a resource — programs use it, and there’s a finite amount of it. The more there is, the more space software has for working with data — it can also be used by the operating system to store frequently accessed data that is found in slower parts of the computer (like disks), which can increase the performance of the computer. If you run out of space, the computer has to do it’s best to figure out how to clean up and make room, if it can.8 GB stands for 8 gigabytes. A gigabyte is a measure of a quantity of information. Everything in a computer is just represented as a bunch of on/off positions of impossibly small switches, we write 0 for off and 1 for on — binary, or binary digits (shortened to “bits”). A byte is equal 8 bits - the number of bits necessary to have enough combinations to represent every letter in the Latin alphabet in upper and lower case, every digit, and all the basic punctuation symbols; a byte is the amount of data that a single letter takes up. “Giga” is the metric prefix for “billion”, so 8 gigabytes is an amount of space that can hold 8 billion letters.

3. Hard Disk – 160GB

A hard disk drive (HDD), hard disk, hard drive, or fixed disk is an electro-mechanical data storage device that stores and retrieves digital data using magnetic storage and one or more rigid rapidly rotating platters coated with magnetic material. The platters are paired with magnetic heads, usually arranged on a moving actuator arm, which read and write data to the platter surfaces. Data is accessed in a random-access manner, meaning that individual blocks of data can be stored and

retrieved in any order. HDDs are a type of non-volatile storage, retaining stored data even when powered off. Modern HDDs are typically in the form of a small rectangular box

SYSTEM ANALYSIS

In this chapter, we will discuss and analyze the developing process of the Library Management System including software requirement specification (SRS) and comparison between existing and proposed systems. The functional and nonfunctional requirements are included in the SRS part to provide complete description and overview of system requirements before the developing process is carried out. Besides that, existing vs proposed provides a view of how the proposed system will be more efficient than the existing one.

2.1 SOFTWARE REQUIREMENT SPECIFICATION

2.1.1 GENERAL DESCRIPTION

PRODUCT DESCRIPTION:

Library Management System is a computerized system which helps the user(librarian) to manage the library daily activity in electronic format. It reduces the risk of paper work such as file loss, file damage and time consuming. It can help users to manage the transaction or record more effectively and save time.

PROBLEM STATEMENT:

The problem occurred before having computerized system includes:

- File lost

  When a computerized system is not implemented a file is always lost because of the human environment. Sometimes due to some human error there may be a loss of records.

- File damaged

  When a computerized system is not there file is always lost due to some accident like spilling of water by some member on file accidentally. Besides, some natural disasters like floods or fires may also damage the files.

- Difficult to search record

When there is no computerized system there is always a difficulty in searching for records if the records are large in number .

- Space consuming

  After the number of records becomes large the space for physical storage of file and records also increases if no computerized system is implemented.

- Cost consuming

  As there is no computerized system to add each record paper will be needed which will increase the cost for the management of the library.

2.1.2 SYSTEM OBJECTIVES

- Improvement in control and performance

  The system is developed to cope up with the current issues and problems of the library .The system can add users, validate users and is also bug free.

- Save cost

  After the computerized system is implemented less human force will be required to maintain the library thus reducing the overall cost.

- Save time

  Librarian is able to search records by using a few clicks of mouse and few search keywords thus saving his valuable time.

- Option of online Notice board

  Librarian will be able to provide a detailed description of workshops going in the college as well as in nearby colleges

- Lecture Notes

  Teacher have a facility to upload lectures notes in a pdf file having size not more than 10mb

2.1.3 SYSTEM REQUIREMENTS

2.1.3.1 NON-FUNCTIONAL REQUIREMENTS

PRODUCT REQUIREMENTS

EFFICIENCY REQUIREMENT

- When a library management system will be implemented, librarians and users will easily access the library as searching and book transactions will be much faster.

RELIABILITY REQUIREMENT

- The system should accurately performs member registration ,member validation , report generation, book transaction and search

USABILITY REQUIREMENT

- The system is designed for a user-friendly environment so that students and staff of the library can perform the various tasks easily and in an effective way.

ORGANIZATIONALREQUIREMENT

IMPLEMENTATION REQUIREMENTS

- In implementing the whole system, it uses HTML in front end with PHP as server side scripting language which will be used for database connectivity and the back end I.e. the database part is developed using MySQL.

DELIVERY REQUIREMENTS

- The whole system is expected to be delivered in six months of time with weekly evaluation by the project guide

2.1.3.2 FUNCTIONAL REQUIREMENTS

1. NORMAL USER

1.1 USER LOGIN

- DESCRIPTION OF FEATURE

  This feature is used by the user to login into the system. They are required to enter user id and password before they are allowed to enter the system .The user id and password will be verified and if invalid id is there user is allowed to not enter the system.

- FUNCTIONAL REQUIREMENTS

  -user id is provided when they register

  -The system must only allow users with valid id and password to enter the system

-The system performs an authorization process which decides what user level can access to.

-The user must be able to logout after they finished using the system.

1.2 REGISTER NEW USER

- DESCRIPTION OF FEATURE

  This feature can be performed by all users to register new users to create accounts.

- FUNCTIONAL REQUIREMENTS

  System must be able to verify information.

  System must be able to delete information if information is wrong

1.3 REGISTER NEW BOOK

- DESCRIPTION OF FEATURE

  This feature allows to add new books to the library

- FUNCTIONAL REQUIREMENT

  -System must be able to verify information

  -System must be able to enter number of copies into table.

  -System must be able to not allow two books having the same book id.

1.4 SEARCH BOOK

- DESCRIPTION OF FEATURE

  This feature is found in the book maintenance part.

  We can search books based on book id , book name , publication or by author name.

- FUNCTIONAL REQUIREMENTS

  - System must be able to search the database based on selected search type

  - System must be able to filter book based on keyword entered

  - System must be able to show the filtered book in table view

  -System should be able to add detailed information about events .

-System should be able to display information on notice board available in the homepage of site

2.1.4 SOFTWARE AND HARDWARE REQUIREMENTS

This section describes the software and hardware requirements of the system

2.1.4.1 **SOFTWARE REQUIREMENTS**

- Operating system- Windows 7 is used as the operating system as it is stable and supports more features and is more user friendly
- Database MYSQL - MYSQL is used as a database as it is easy to maintain and retrieve records by simple queries which are in English language which are easy to understand and easy to write.
- Development tools and Programming language- HTML is used to write the whole code and develop web pages with css, java script for styling work and php for server side scripting

2.1.4.2 **HARDWARE REQUIREMENTS**

➔ Intel core i5 2nd generation is used as a processor because it is faster than other processors and provides reliability and stability and we can run our pc for longtime. By using this processor we can keep on developing our project without any worries.

➔ Ram 1 GB is used as it will provide fast reading and writing capabilities and will in turn support in processing.

Existing System:

➔ Early days Libraries are managed manually. It required a 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. Reporting generations of all the information is a very tough task.

➔ Maintenance of Library catalog and arrangement of the books to the catalog is a 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.
- Regarding the members designation, a number of books were issued.
- Issue dates and returns of each member are 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.

DISPLAY TECHNOLOGY

SOFTWARE TOOLS USED

The whole Project is divided in two parts the front end and the back end

2.3.1 Front end

The front end is designed using of HTML , PHP ,CSS, Java script

HTML

HTML or Hypertext Markup Language Is the main markup language for creating web pages and other information that can be displayed in a web browser.HTML is written in the form of HTML elements consisting of tags enclosed in angle brackets (like), within the web page content.HTML tags most commonly come in pairs like <h1> and </h1>, although some tags represent empty elements and so are unpaired, for example <img>. The first tag in a pair is the start tag, and the second tag is the end tag (they are also called opening tags and closing tags). In between these tags web designers can add text, further tags, comments and other types of text-based content. The purpose of a web browser is to read HTML documents and compose them into visible or audible web pages. The browser does not display the HTML tags, but uses the tags to interpret the content of the page.HTML elements form the building blocks of all websites. HTML allows images and objects to be embedded and can be used to create interactive forms. It provides a means to create structured documents by denoting structural semantics for text such as headings, paragraphs, lists, links, quotes and other items. It can embed scripts written in languages such as JavaScript which affect the behavior of HTML web pages.

CSS

Cascading Style Sheets (CSS) is a style sheet language used for describing the look and formatting of a document written in a markup language. While most often used to style web pages and interfaces written in HTML and XHTML, the language can be applied to any kind of XML document, including plain XML, SVG and XUL. CSS is a cornerstone specification of the web and almost all web pages use CSS style sheets to describe their presentation.CSS is designed primarily to enable the separation of document content from document presentation, including elements such as the layout, colors, and fonts. This separation can improve content accessibility, provide more flexibility and control in the specification of presentation characteristics, enable

multiple pages to share formatting, and reduce complexity and repetition in the structural content (such as by allowing for table less web design).CSS can also allow the same markup page to be presented in different styles for different rendering methods, such as on-screen, in print, by voice (when read out by a speech-based browser or screen reader) and on Braille-based, tactile devices. It can also be used to allow the web page to display differently depending on the screen size or device on which it is being viewed. While the author of a document typically links that document to a CSS file, readers can use a different style sheet, perhaps one on their own computer, to override the one the author has specified. However if the author or the reader did not link the document to a specific style sheet the default style of the browser will be applied.CSS specifies a priority scheme to determine which style rules apply if more than one rule matches against a particular element. In this so-called cascade, priorities or weights are calculated and assigned to rules, so that the results are predictable.

JAVA SCRIPT

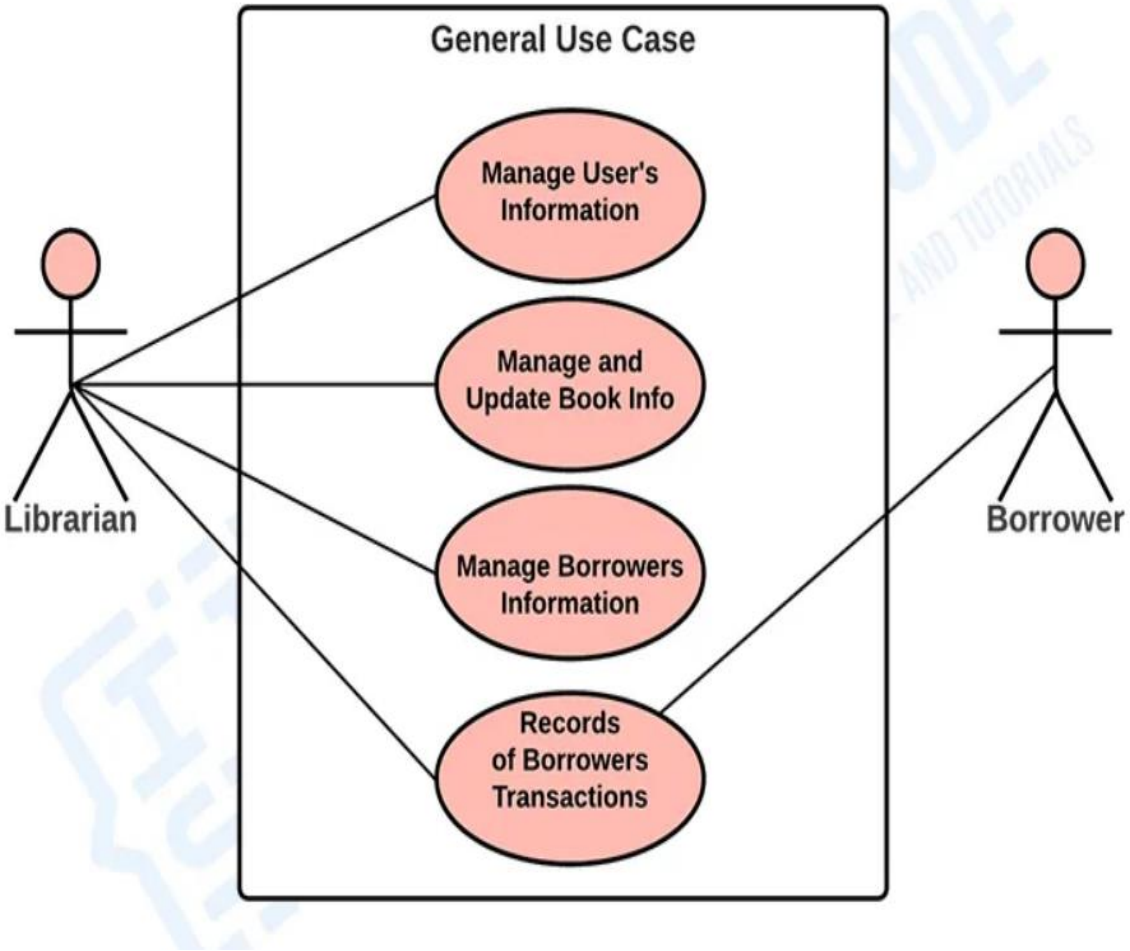
JavaScript (JS) is a dynamic computer programming language. It is most commonly used as part of web browsers, whose implementations allow client side scripts to interact with the user, control the browser, communicate asynchronously, and alter the document content that is displayed. It is also being used in server-side programming, game development and the creation of desktop and mobile applications. JavaScript is a prototype-based scripting language with dynamic typing and has first-class functions. Its syntax was influenced by C. JavaScript copies many names and naming conventions from Java, but the two languages are otherwise unrelated and have very different semantics. The key design principles within JavaScript are taken from the Self and Scheme programming languages. It is a multi-paradigm language, supporting object-oriented, imperative, and functional programming styles. The application of JavaScript to use outside of web pages—for example, in PDF documents, site-specific browsers, and desktop widgets—is also significant. Newer and faster JavaScript VMs and platforms built upon them (notably Node.js) have also increased the popularity of JavaScript for server-side web applications. On the client side, JavaScript was traditionally implemented as an interpreted language but just-in-time compilation is now performed by recent (post-2012) browser

SYSTEM DESIGN

4.1 USE CASE DIAGRAMS

A use case diagram is a visual representation of how a user might interact with a program. A use case diagram depicts the system's numerous use cases and different sorts of users and is frequently supplemented by other diagrams. Circles or ellipses are used to depict the use cases.

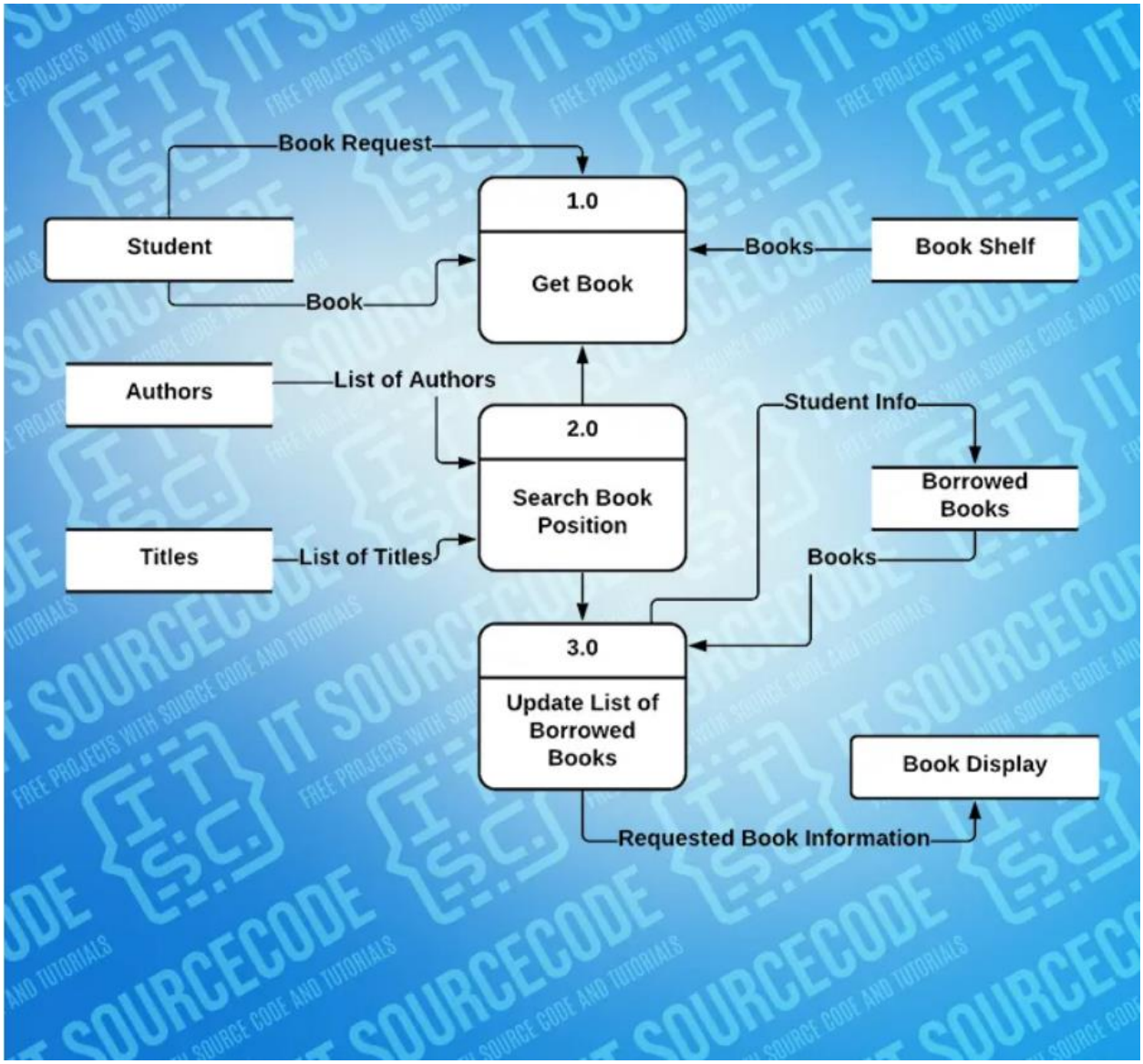
This discusses the meaning of the library management system project UML as well as its use case diagram using include and extend. By creating the use case of the library management system, you must first determine the possible features to identify the flow of the system. After that, you can now create the blueprint or core of the system function.



4.2 DATA FLOW DIAGRAM

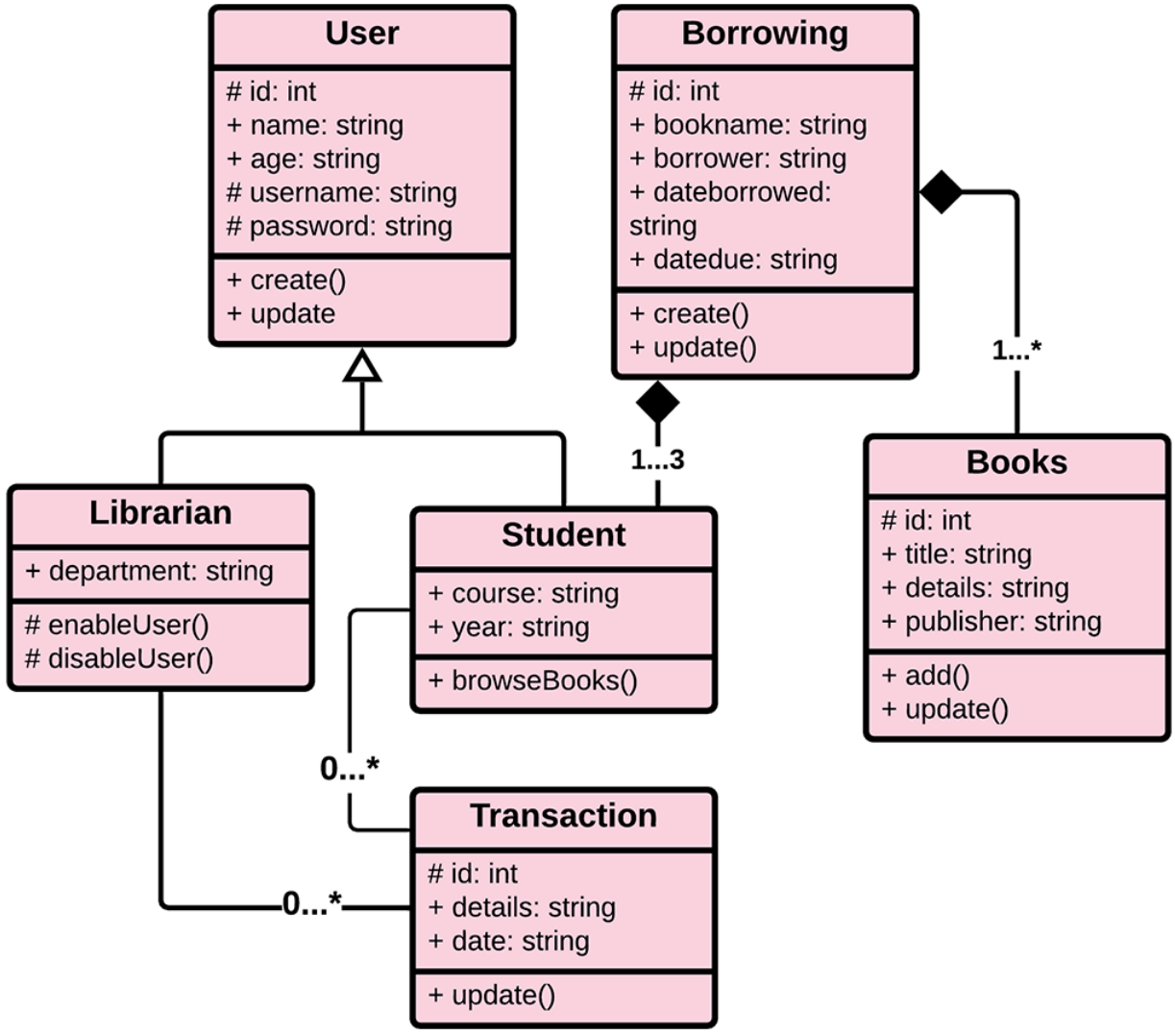
This knowledge will also give you a deep understanding about **Library management system DFD levels 0, 1 and 2**. I will also teach you the terms in managing the **Library transactions** as well as the flow of activities happening in the library management system.

The Data Flow Diagram (DFD) represents the flow of data and the transformations in the Library management system. These transformations occur as data enters and exits a system. In the DFD, input, processing, and output are used to represent and define the overall system.



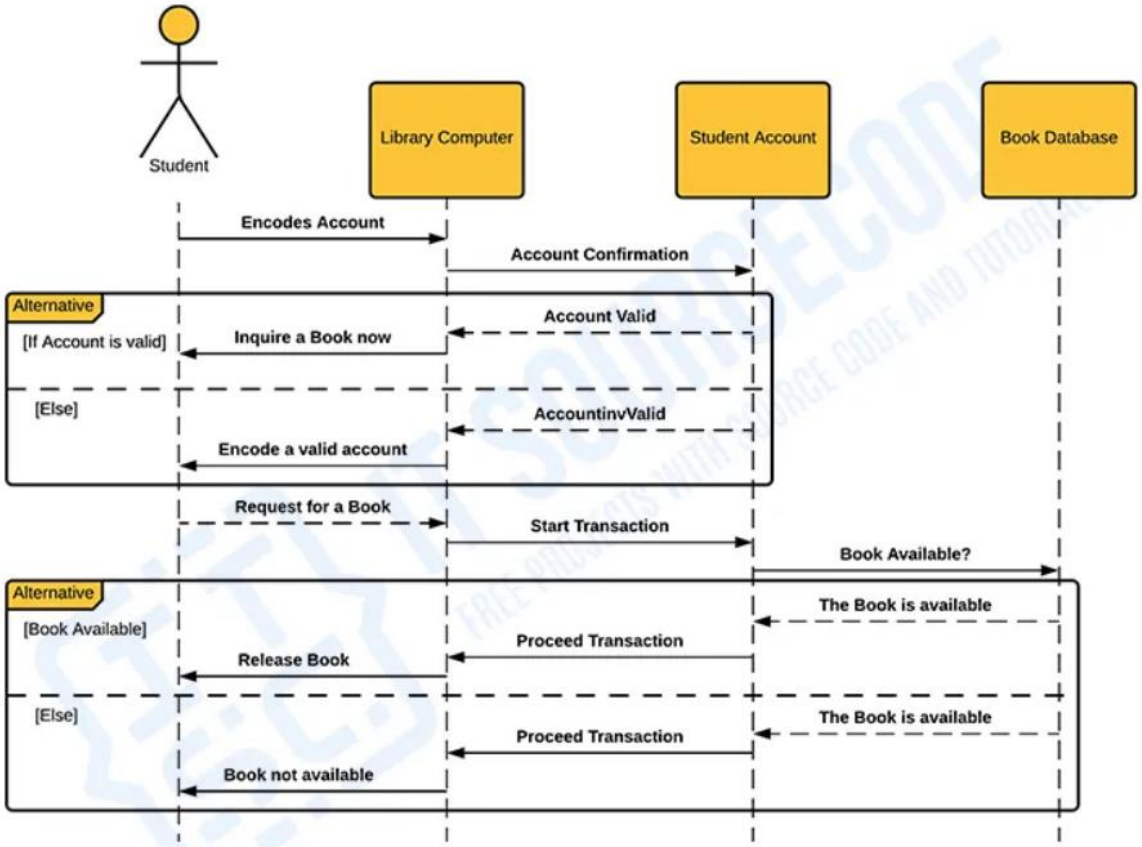
4.3 CLASS DIAGRAM

LIBRARY MANAGEMENT SYSTEM CLASS DIAGRAM is a designed diagram that shows the system's relationships and classes. This UML Class Diagram is made to guide programmers along with the library management system development. It contains the class attributes, methods as well as the relationships between classes. These mentioned contents make sure that your Library management system development must inline with what should be its functions.



4.4 SEQUENCE DIAGRAM

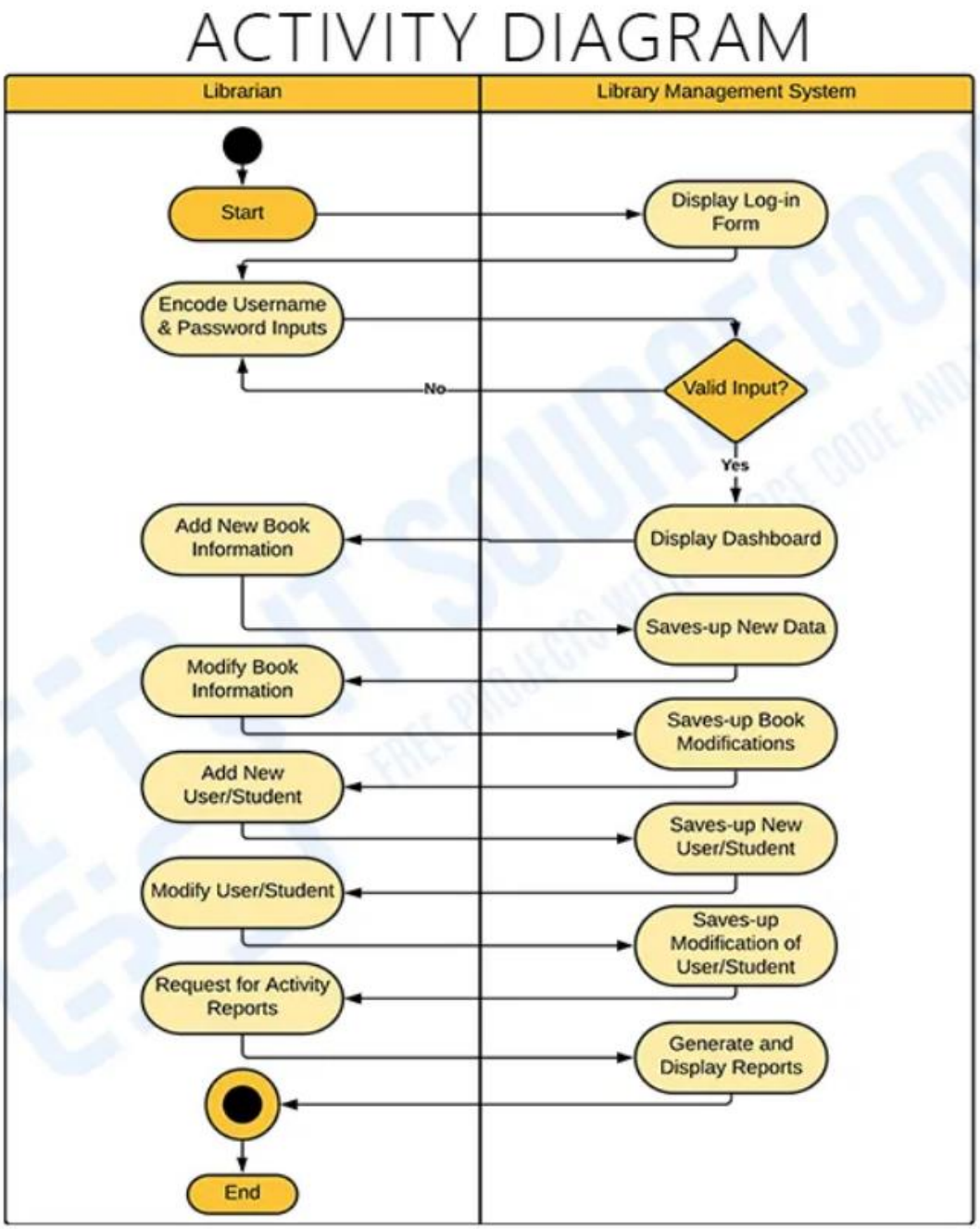
Library Management System Sequence Diagram is a designed Unified Modeling Language (UML) diagram that shows the sequence of messages or events between objects in the system interactions. It helps illustrate the sequence of messages that passed between the actors and objects. Sequence diagrams are also able to explain in detail how the Library Management System controls the structures between objects.



SEQUENCE DIAGRAM

4.5 ACTIVITY DIAGRAM

Library Management System Activity Diagram is one of the UML diagrams that will show the behavior of the Library System to its users. This activity diagram for library management is using symbols just like swim lanes, shapes and arrows, to illustrate the interactions between the user and system.



SOURCE CODE

```
public class Book {
    int id;
    String title;
    String author;
    boolean isIssued;

    public Book(int id, String title, String author) {
        this.id = id;
        this.title = title;
        this.author = author;
        this.isIssued = false;
    }

    public void displayInfo() {
        System.out.println("ID: " + id + ", Title: " + title + ", Author: " + author + ", Issued: " +
isIssued);
    }
}

mport java.util.ArrayList;
import java.util.Scanner;

public class Library {
    ArrayList<Book> books = new ArrayList<>();
```

```
Scanner sc = new Scanner(System.in);

public void addBook() {
    System.out.print("Enter Book ID: ");
    int id = sc.nextInt();
    sc.nextLine();
    System.out.print("Enter Title: ");
    String title = sc.nextLine();
    System.out.print("Enter Author: ");
    String author = sc.nextLine();
    books.add(new Book(id, title, author));
    System.out.println("Book added successfully.");
}

public void showBooks() {
    if (books.isEmpty()) {
        System.out.println("No books available.");
        return;
    }
    for (Book b : books) {
        b.displayInfo();
    }
}

public void issueBook() {
```

```
        System.out.print("Enter Book ID to issue: ");
        int id = sc.nextInt();
        for (Book b : books) {
            if (b.id == id && !b.isIssued) {
                b.isIssued = true;
                System.out.println("Book issued successfully.");
                return;
            }
        }
        System.out.println("Book not found or already issued.");
    }

    public void returnBook() {
        System.out.print("Enter Book ID to return: ");
        int id = sc.nextInt();
        for (Book b : books) {
            if (b.id == id && b.isIssued) {
                b.isIssued = false;
                System.out.println("Book returned successfully.");
                return;
            }
        }
        System.out.println("Book not found or wasn't issued.");
    }
}
```

```
mport java.util.Scanner;


public class Main {
    public static void main(String[] args) {
        Library lib = new Library();
        Scanner sc = new Scanner(System.in);
        int choice;

        do {
            System.out.println("\n--- Library Menu ---");
            System.out.println("1. Add Book");
            System.out.println("2. Show Books");
            System.out.println("3. Issue Book");
            System.out.println("4. Return Book");
            System.out.println("5. Exit");
            System.out.print("Enter choice: ");
            choice = sc.nextInt();

            switch (choice) {
                case 1: lib.addBook(); break;
                case 2: lib.showBooks(); break;
                case 3: lib.issueBook(); break;
                case 4: lib.returnBook(); break;
                case 5: System.out.println("Exiting system."); break;
                default: System.out.println("Invalid choice.");
```

```
            }
        } while (choice != 5);


        sc.close();
    }
}
```

SOURCE CODE DESCRIPTION

To develop a simple Library Management System using Java that allows the user to:

Add new books

View all books

Issue (lend out) books

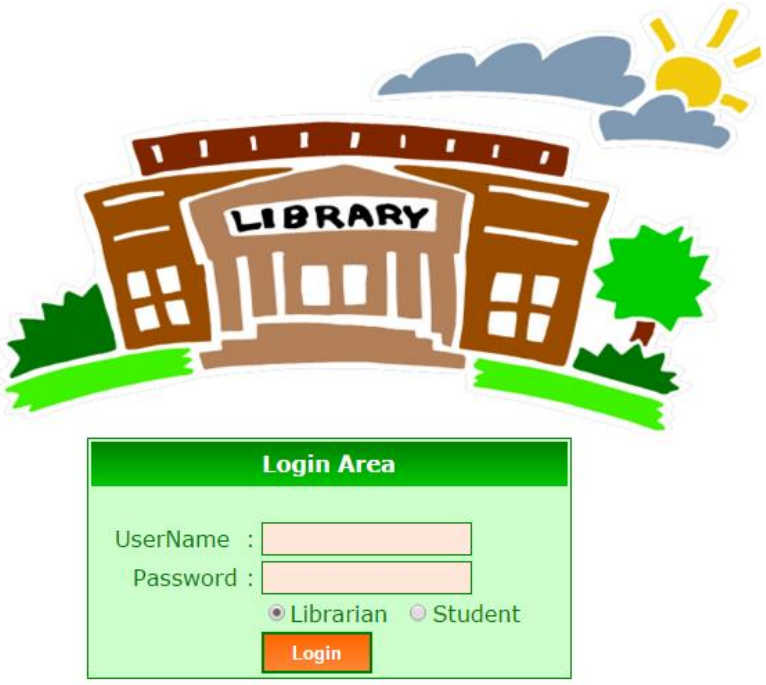
Return books

Exit the system

OUTPUT

5. LIBRARIAN VIEW

5.1 Snapshot for homepage



The following web pages Constitute the 'College Library Management' Website

●Main Page

- Consisting of the welcome and Registration columns

●Login Page

- Includes an Interface to Login both for User and Administrator
- A forgot Password facility

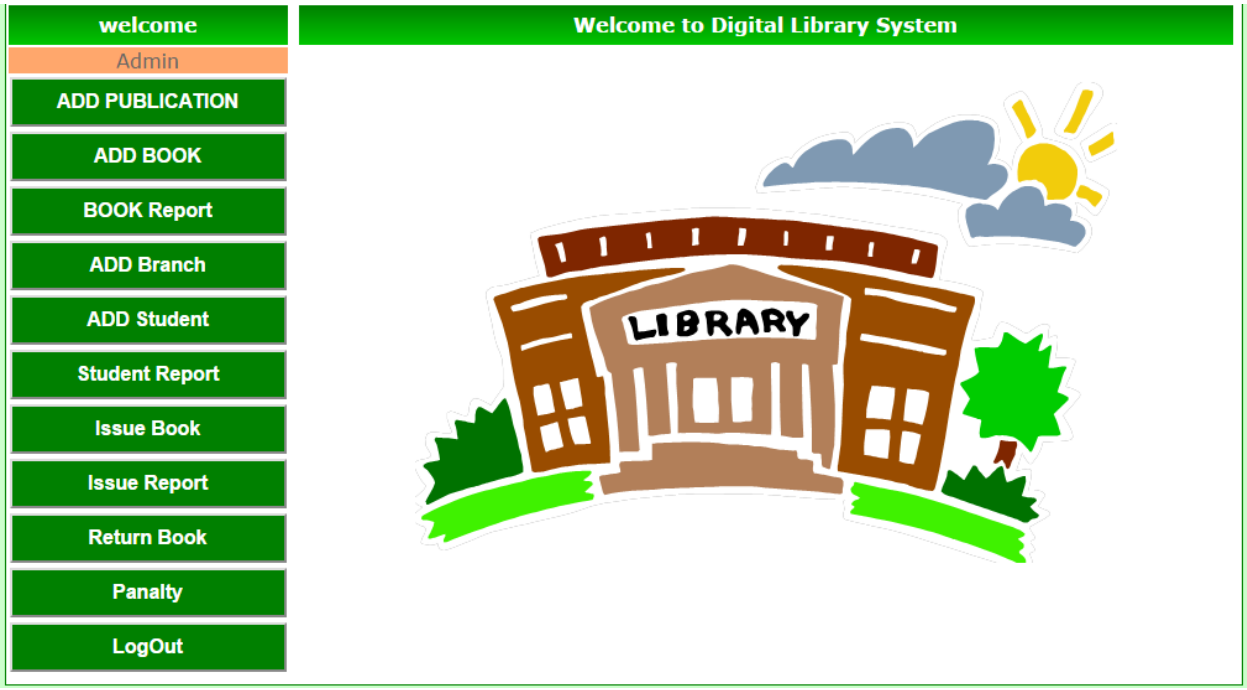
●Admin Page

- Includes links to other pages: Add Books, Remove Books, Manage Users
- Has a welcome page with profile option
- A Logout tab

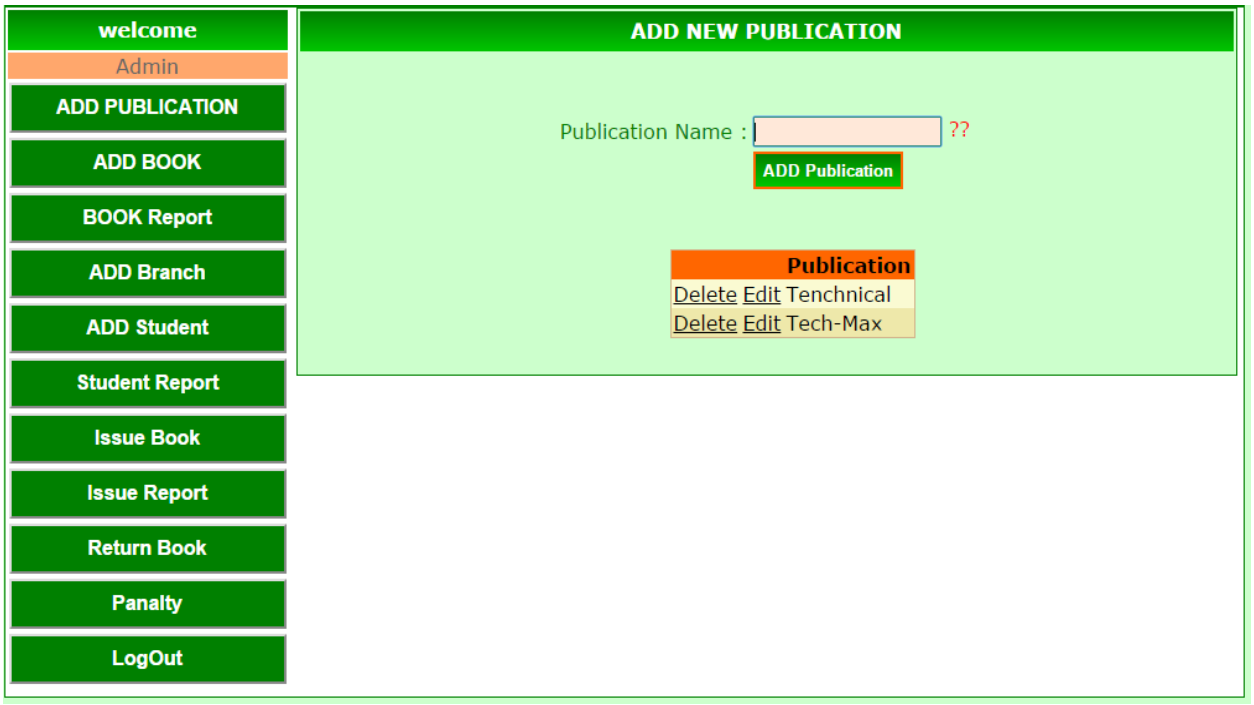
●A User page

- Includes links to other pages: Issue Books, Account, Return Books
- And a welcome page with profile option
- A Logout tab

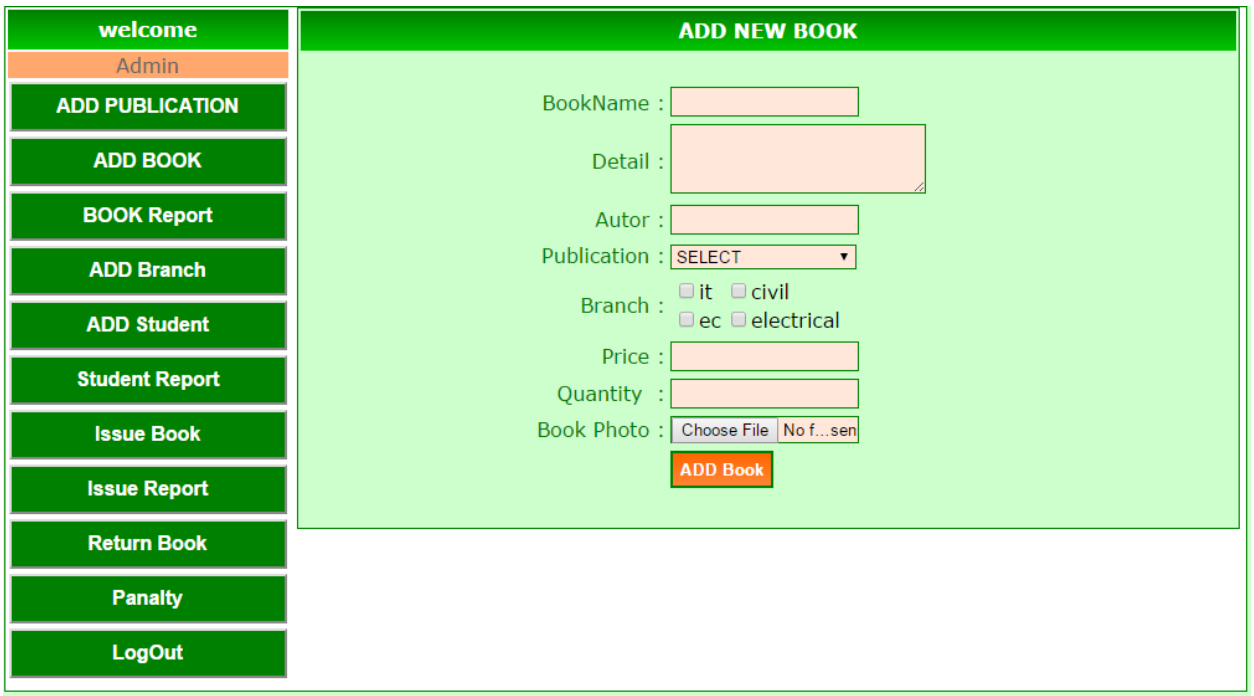
5.1.1 ADMIN HOME PAGE



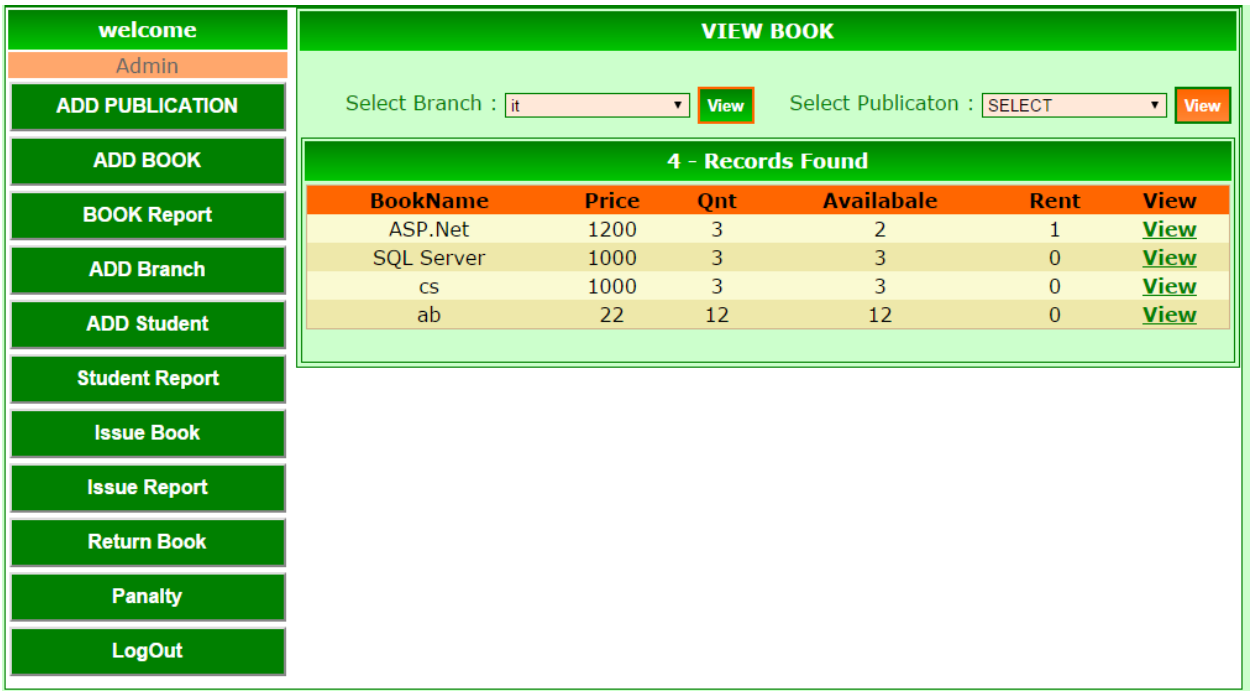
5.1.2 ADD PUBLICATION



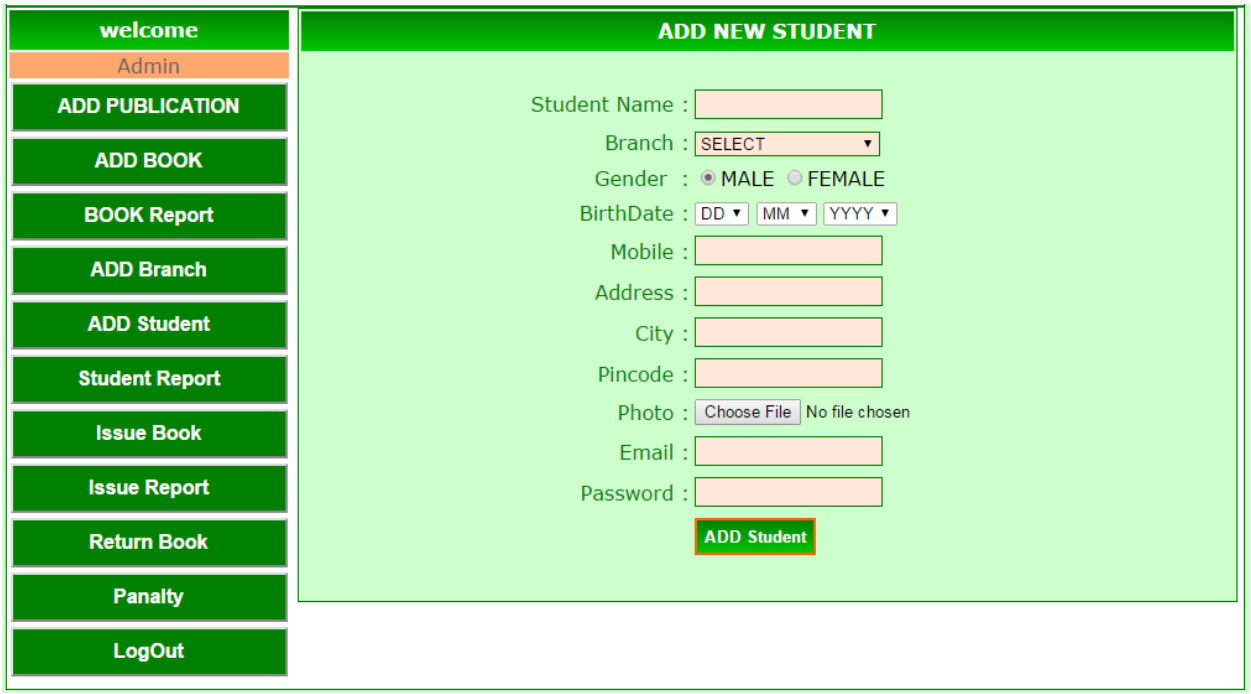
5.1.3 ADD BOOK



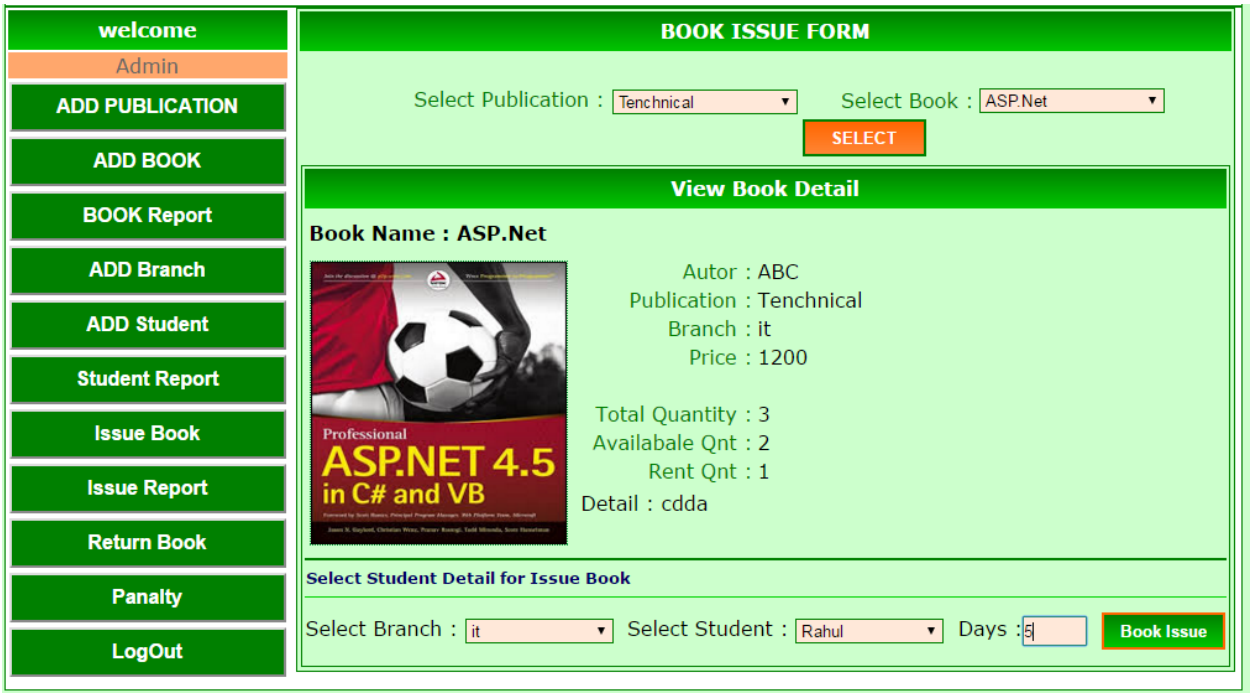
5.1.4 BOOK REPORT



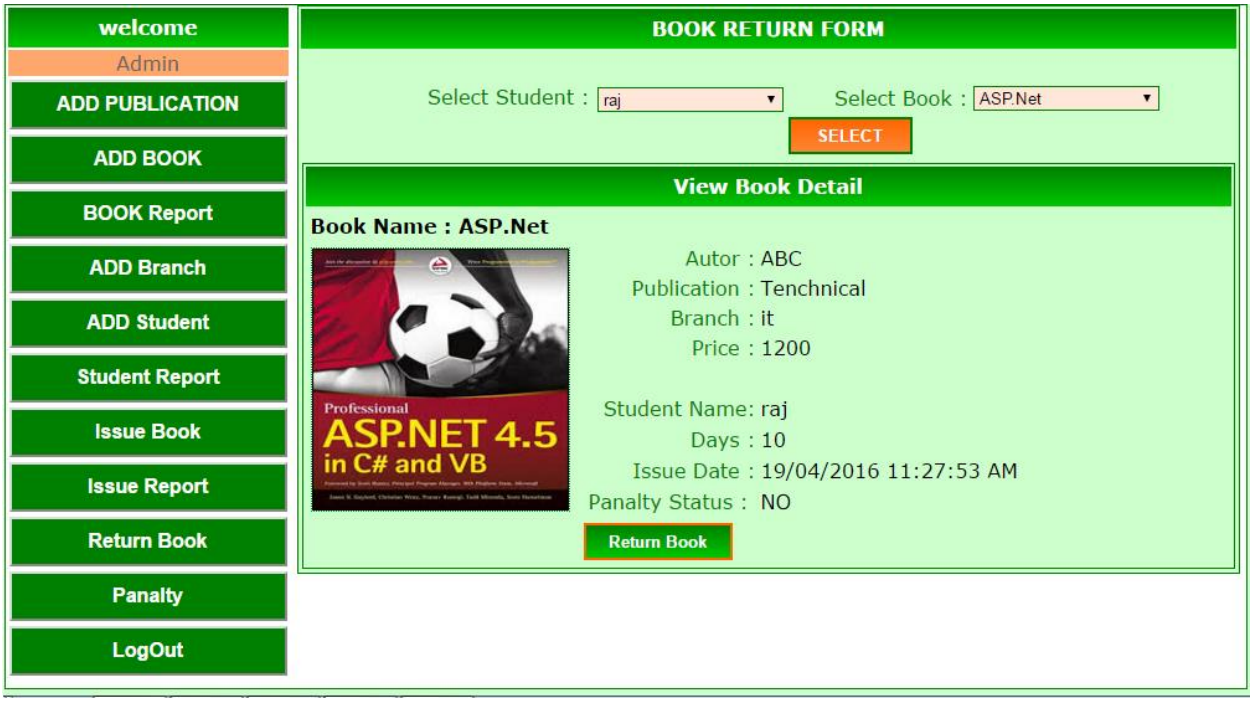
5.1.5 ADD STUDENT



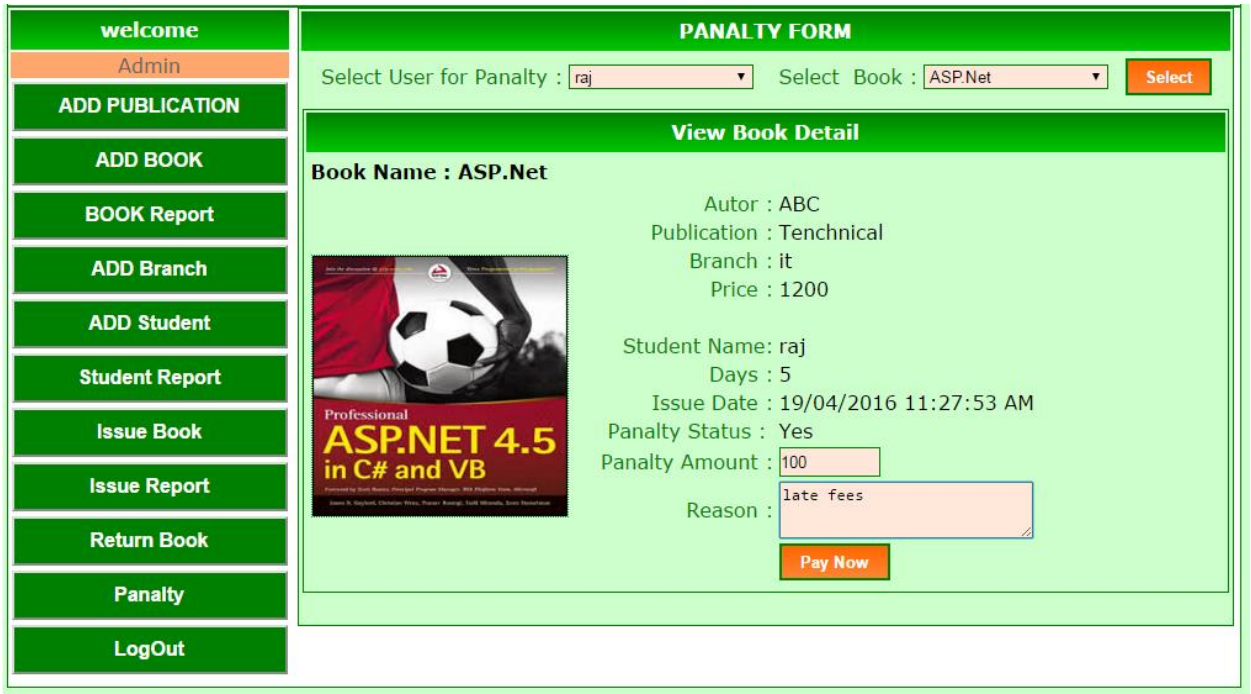
5.1.6 ISSUE BOOK



5.1.7 REPORT BOOK

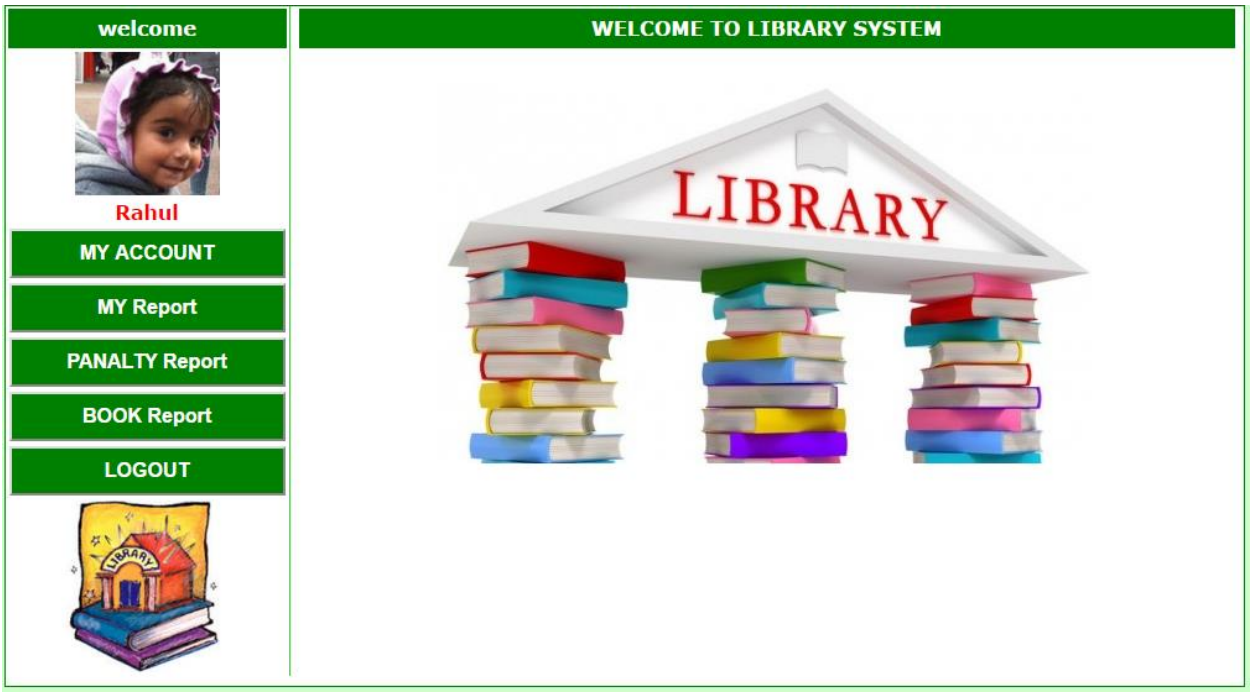


5.1.8 PENALTY

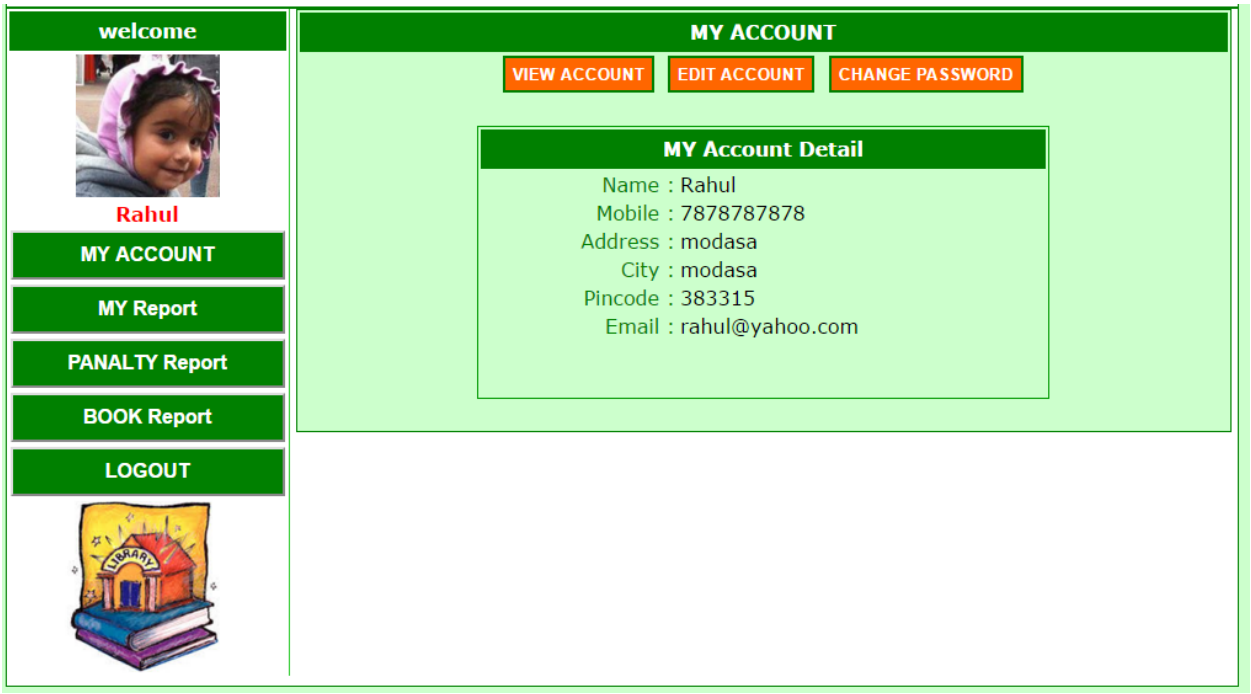


5.2 STUDENT VIEW

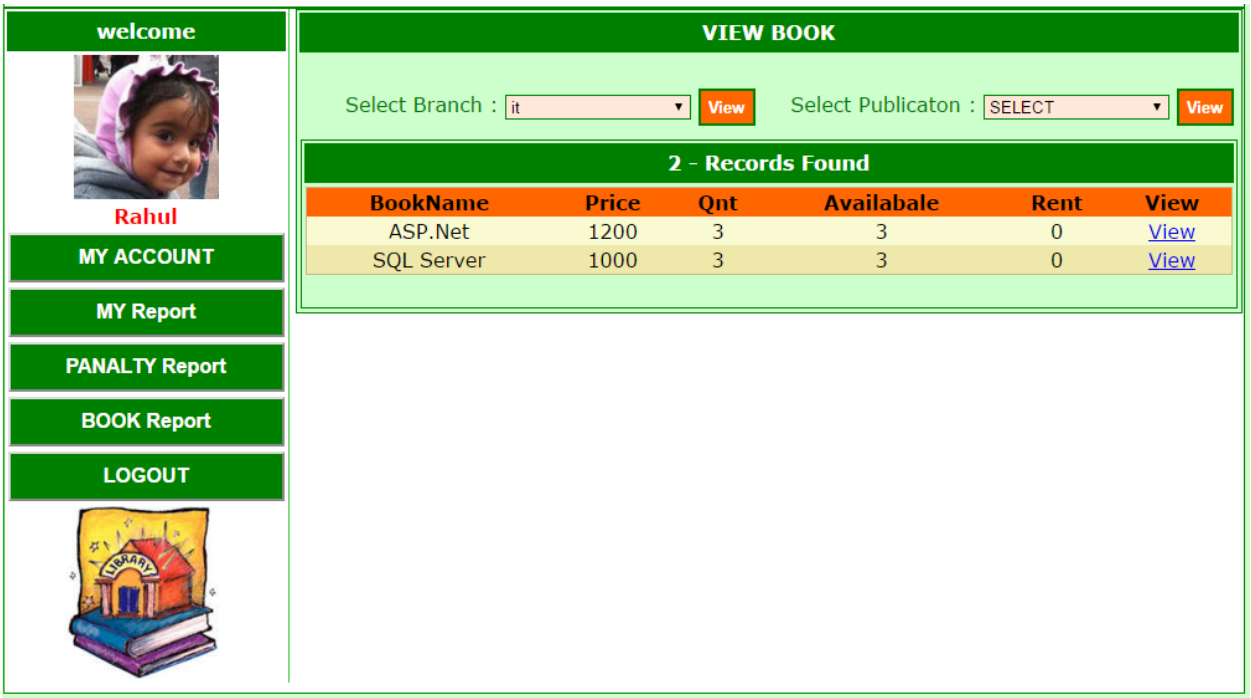
5.2.1 STUDENT HOMEPAGE



5.2.2 STUDENT ACCOUNT PAGE

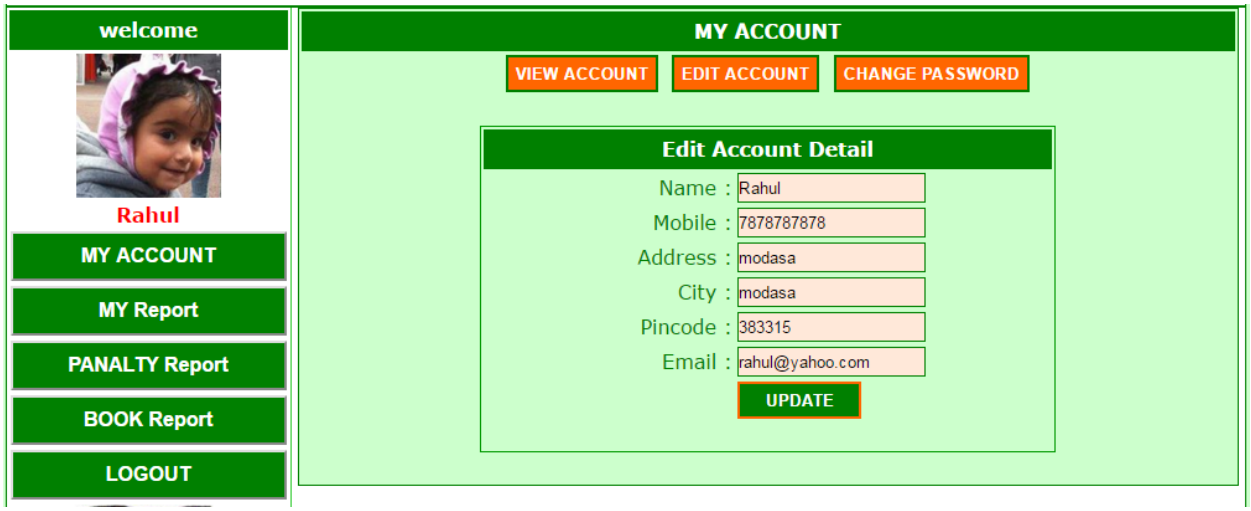


5.2.3 STUDENT REPORT PAGE

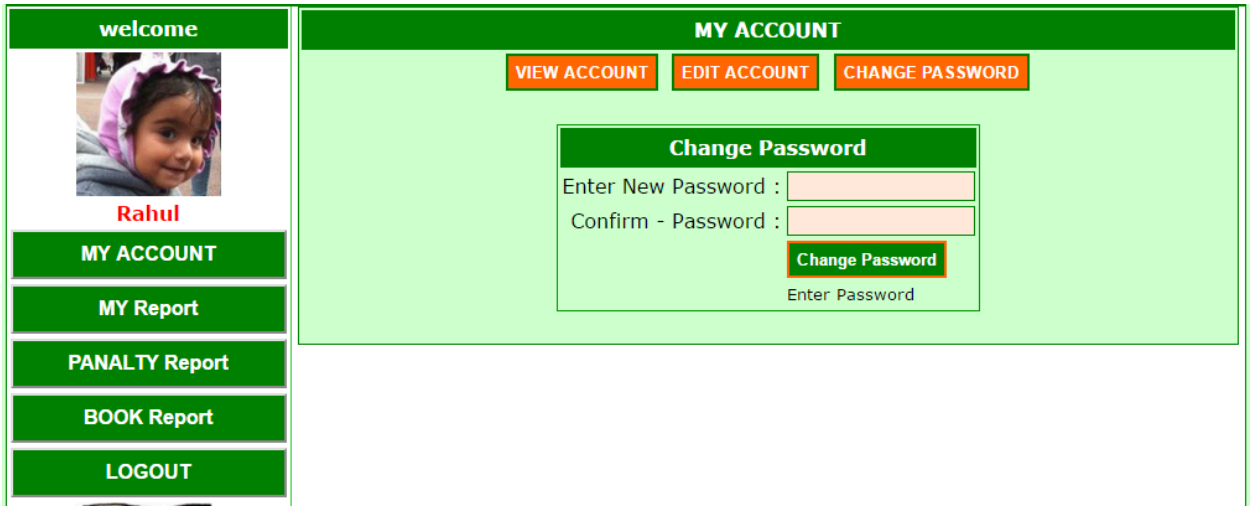


5.2.4 STUDENT PANELTY PAGE

5.2.5 EDIT ACCOUNTING



5.2.6 CHANGE PASSWORD



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

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

Unit testing was done on each and every module that is described under module

1. Test For the admin module

- Testing admin login form-This form is used for login 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 academic 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 books and can add the details to the main book table also he can view the books requests.

2. Test for Student login module

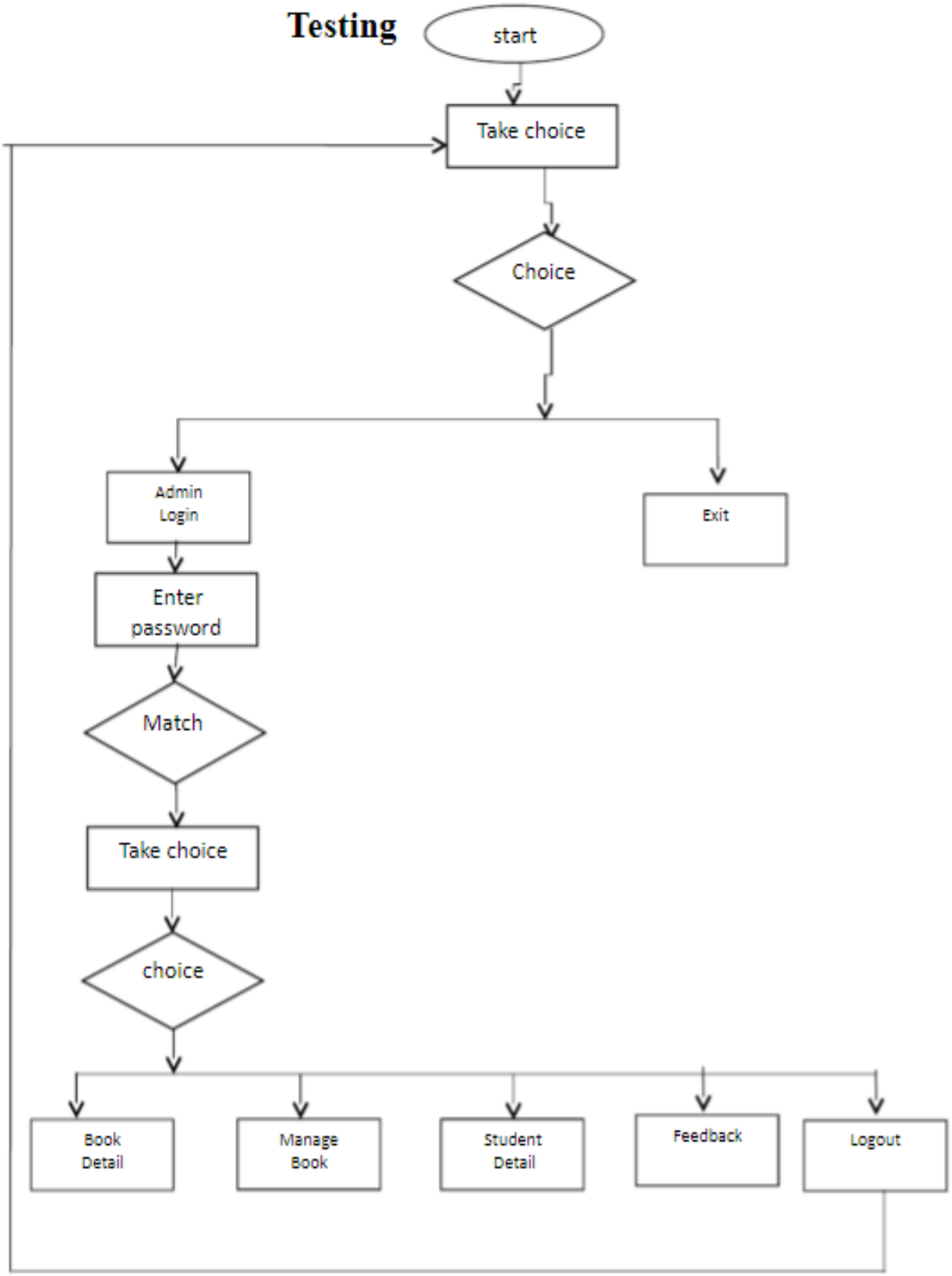
- Test for Student login Form-This form is used for login of Student. In this we enter the librarysd, username and password if all these are correct, the student login page will open, otherwise if any of the data is wrong it will get redirected back to the login page and again ask for library id, username and password.
- Test for account creation- This form is used for new account creation when a 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 a page which shows waiting for confirmation messages as his data will be only added by the administrator after verification.

3. Test for teacher login module-

Test for teacher login form- This form is used for login 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.

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


Testing
start
Take choice
Choice
Admin Login
Exit
Enter password
Match
Take choice
choice
Book Detail
Manage Book
Student Detail
Feedback
Logout

CONCLUSION

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

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.

REFERENCES

http://www.w3schools.com/html/html_intro.asp

http://www.Udemy.com/css/css_background.asp

http://www.w3schools.com/js/js_datatypes.asp

http://www.w3schools.com/html/html_intro.asp

http://www.w3schools.com/css/css_background.asp

http://www.w3schools.com/js/js_datatypes.asp

http://www.w3schools.com/sql/sql_insert.asp

http://www.w3schools.com/sql/sql_update.asp

http://www.w3schools.com/php/php_forms.asp

Fundamentals of software engineering by Rajib mall, PHI learning

Web development and application development by Ivan Byross BPB publications

Library Management System | Library Management Software in India (skoolbeep.com)

https://www.sciencedirect.com/.../library-management-system

https://www.trustradius.com/library-management

https://www.geeksforgeeks.org/e-library-management-system