

# **LIBRARY MANAGEMENT**

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## **ABSTRACT**

Online 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. Owing to the advancement of technology, organization of an Online Library becomes much simple. The Online Library Management has been designed to computerize and automate the operations performed over the information about the members, book issues and returns and all other operations. This computerization of library helps in many instances of its maintenances. It reduces the workload of management as most of the manual work done is reduced

## **1.INTRODUCTION**

The "Library Management System" has been developed to override the problems prevailing in the practicing manual system. This software is supported to eliminate and, in some cases, reduce the hardships faced by this existing system. Moreover, this system is designed for the particular need of the company to carry out operations in a smooth and effective manner. The application is reduced as much as possible to avoid errors while entering the data. It also provides error message while entering invalid data. No formal knowledge is needed for the user to use this system. Thus, by this all it proves it is user-friendly. Library Management System, as described above, can lead to error free, secure, reliable and fast management system. It can assist the user to concentrate on their other activities rather to concentrate on the record keeping. Thus, it will help organization in better utilization of resources. Every organization, whether big or small, has challenges to overcome and managing the information of Books, Student, Librarian, Address, and Member. Every Library Management System has different Student needs; therefore, we design exclusive employee management systems that are adapted to your managerial requirements. This is designed to assist in strategic planning, and will help you ensure that your organization is equipped with the right level of information and details for your future goals. Also, for those busy executive who are always on the go, our systems come with remote access features, which will allow you to manage your workforce anytime, at all times.

## **1.1. PROJECT AIM AND OBJECTIVE**

### **AIM:**

The project aim is that will be achieved after completion of the system was carried out. The succession of the system also will be evaluated.

### **OBJECTIVES**

The main objective of the Project on Library Management System is to manage the details of Student, Books, Issues, Librarian, and Member. It manages all the information about Student, Address of Member as well as Student. The project is totally built at administrative end and thus only the administrator is guaranteed the access. The purpose of the project is to build a web-based application program to reduce the manual work for managing the Student, Books, Address, and Issues. It tracks all the details about the Issues, Librarian, Member, etc.

1. The objectives of a library management system is to operate a library with efficiency and at reduced costs. The system being entirely automated streamlines all the tasks involved in operations of the library.
2. The activities of book purchasing, cataloging, indexing, circulation recording and stock checking are done by the software. Such software eliminates the need for repetitive manual work and minimizes the chances of errors.
3. The library management system software helps in reducing operational costs. Managing a library manually is labor intensive and an immense amount of paperwork is involved. An automated system reduces the need for manpower and stationery. This leads to lower operational costs.
4. The system saves time for both the user and the librarian. With just a click the user can search for the books available in the library. The librarian can answer queries with ease regarding the availability of books.
5. Adding, removing or editing the database is a simple process. Adding new members or cancelling existing memberships can be done with ease.

6. Stock checking and verification of books in the library can be done within a few hours. The automated system saves a considerable amount of time as opposed to the manual system.
7. The library management system software makes the library a smart one by organizing the books systematically by author, title and subject. This enables users to search for books quickly and effortlessly.
8. Students need access to authentic information. An advanced organized library is an integral part of any educational institution.
9. In this digital age a web-based library management system would be ideal for students who can access the library's database on their smartphones.
10. The main objective of the Project of Library Management System is to manage the details of users as well as books.
11. It also manages all the information about Student, Address of Member as well as Student.

## **2. SYSTEM ANALYSIS**

In this chapter, we will discuss and analyze about the developing process of Library Management System including software requirement specification (SRS) and comparison between existing and proposed system. The functional and non-functional requirements are included in SRS part to provide complete description and overview of system requirement 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(SRS)**

#### **2.1.1 SYSTEM REQUIREMENTS**

- **NON FUNCTIONAL REQUIREMENTS**
- Product Requirements

#### **EFFICIENCY REQUIREMENT**

When a library management system will be implemented librarian and user will easily access library as searching and book transaction will be very 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 student and staff of library can perform the various tasks easily and in an effective way.

#### **ORGANIZATIONAL REQUIREMENT**

#### **IMPLEMENTATION REQUIREMENTS:**

In implementing whole system it uses html in front end with php as server side scripting language which will be used for database connectivity and the backend 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 a weekly evaluation by the project guide.

- **FUNCTIONAL REQUIREMENTS**

## **NORMAL USER**

### **USER LOGIN**

#### **DESCRIPTION OF FEATURE :**

This feature used by the user to login into 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 user with valid id and password to enter the system
- The system performs authorization process which decides what user level can access to.
- The user must be able to logout after they finished using system.

### **REGISTER NEW USER**

#### **DESCRIPTION OF FEATURE :**

This feature can be performed by all users to register new user to create account. Functional requirements

- System must be able to verify information
- System must be able to delete information if information is wrong

### **REGISTER NEW BOOK**

#### **DESCRIPTION OF FEATURE :**

This feature allows adding new books to the library Functional requirements

- 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 same book id.



## **SEARCH BOOK**

### **DESCRIPTION OF FEATURE :**

This feature is found in book maintenance part. We can search book based on book id , book name , publication or by author name. Functional requirements

- System must be able to search the database based on select 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 Functional requirements
- 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

### **3. SOFTWARE AND HARDWARE REQUIREMENT**

#### **SPECIFICATION**

##### **HARDWARE**

Hardware is a term that refers to all the physical parts that make up a computer. The internal hardware devices that make up the computer. Various devices which are essentials to form hardware is called as components.

Following are the hardware a specification that is required to develop this project is as follows:

1. Computer components like Monitor, Keyboard, Mouse, CPU, and Keyboard.
2. Minimum 1 GB ram for smooth working of application.
3. 250 GB Hard Disk or More. CD ROM Drive.

##### **SOFTWARE**

Computer software, or simply software, is a collection of data or computer instructions that tell the computer how to work. This is in contrast to physical hardware, from which the system is build and actually performs the work.

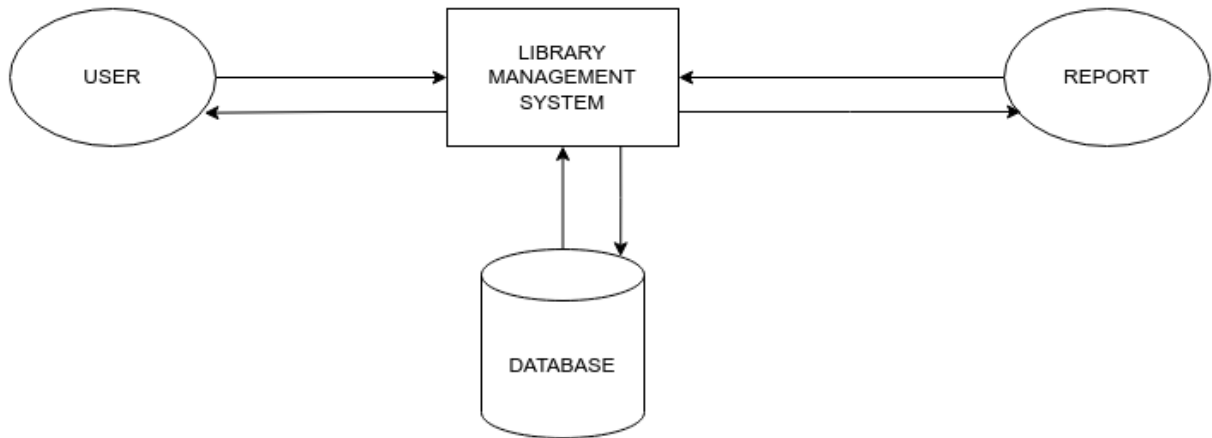
- **Front End**- Python
- **Back End**- MySQL Workbench
- **Text Editor**-VS Code Editor

##### **OPERATING SYSTEM**

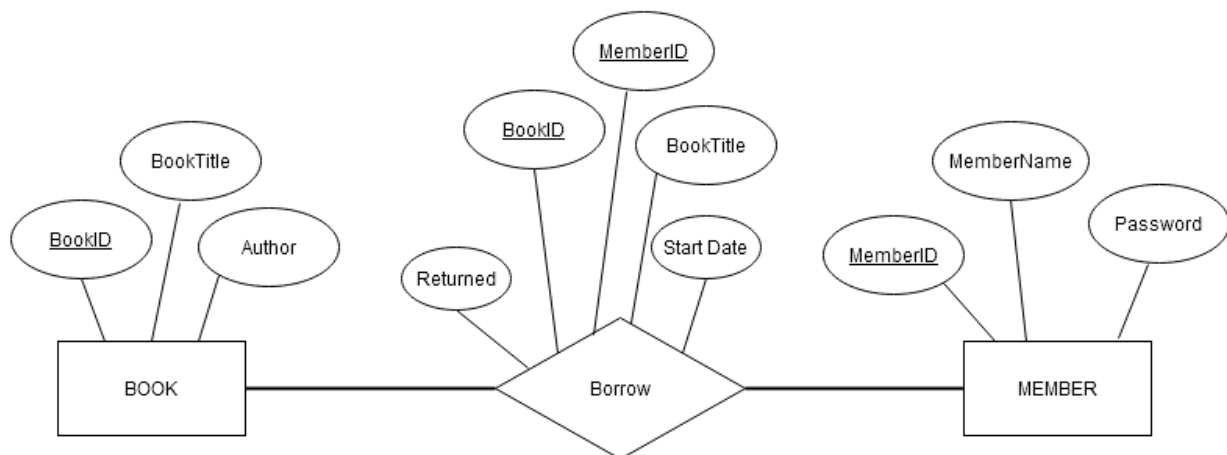
- Windows10
- Ubuntu Linux

## 4. DETAILED SYSTEM ANALYSIS

### 4.1 DATA FLOW DIAGRAM:

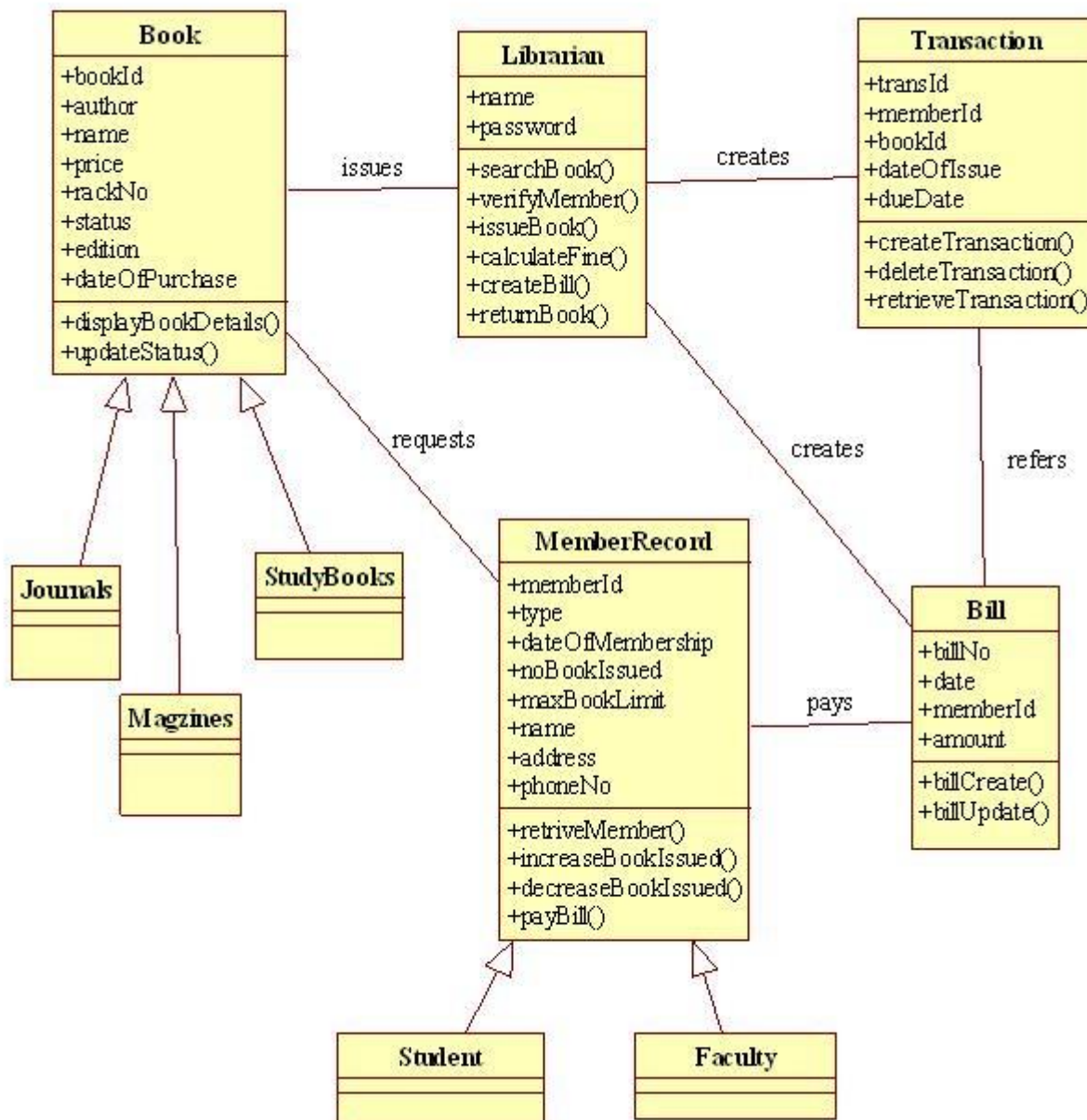


### 4.2 ER DIAGRAM:

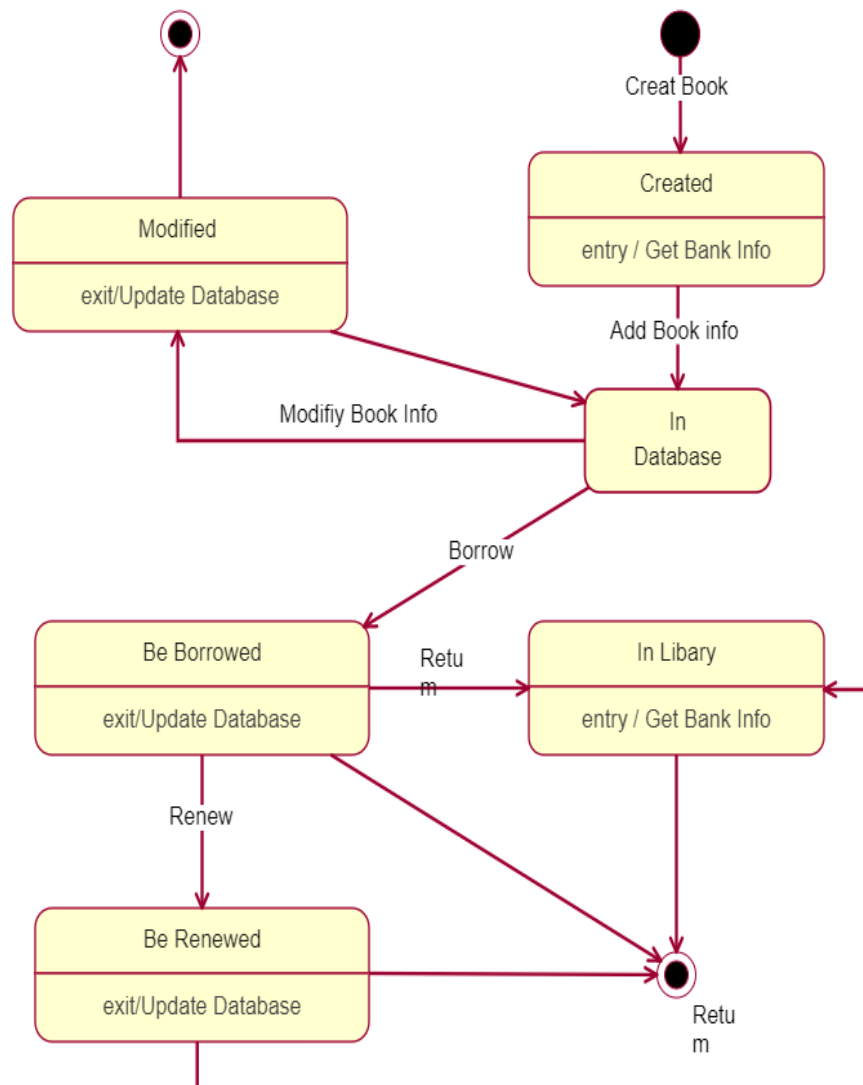


### 4.3 UML DIAGRAMS:

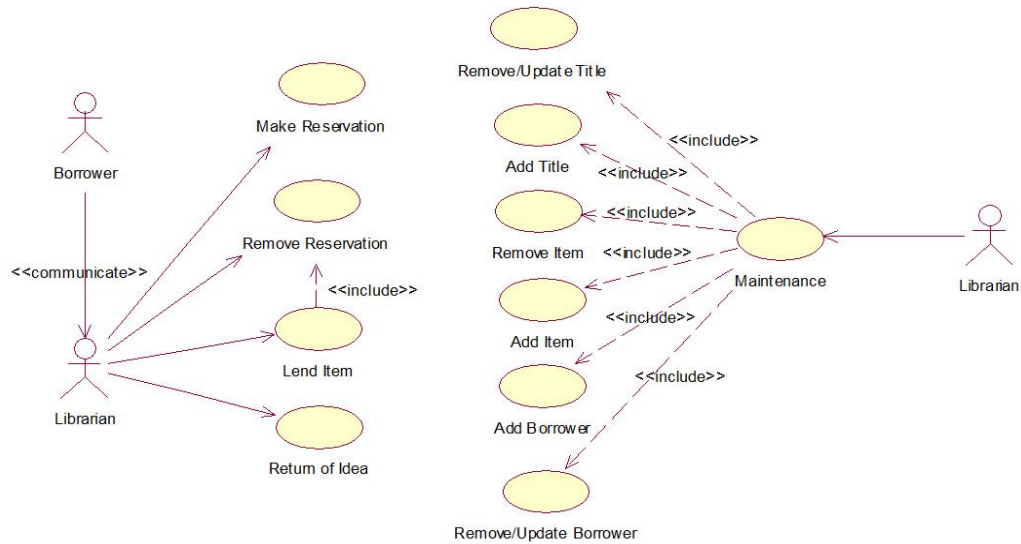
➤ CLASS DIAGRAM FOR LIBRARY MANAGEMENT SYSTEM:



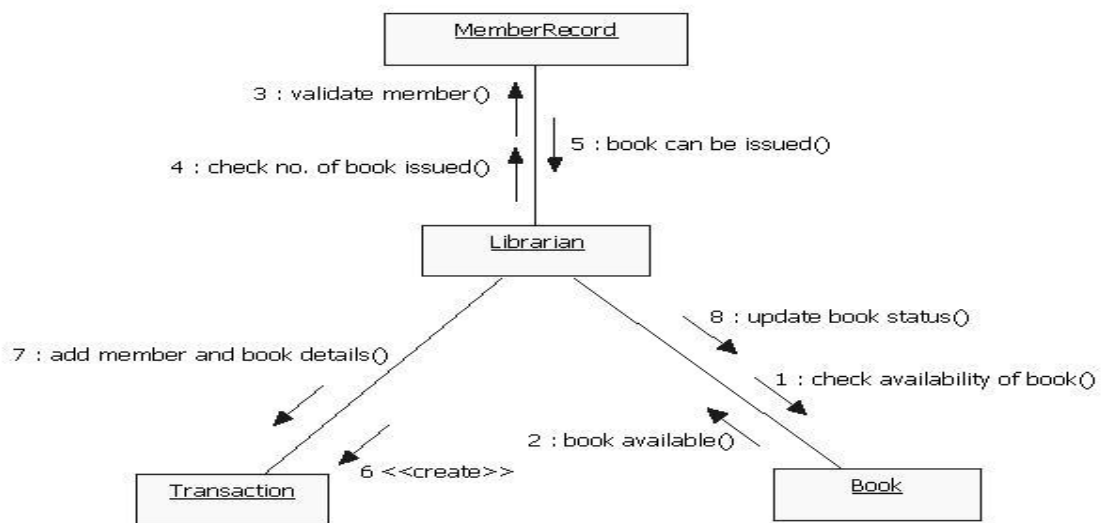
➤ **OBJECT DIAGRAM FOR LIBRARY MANAGEMENT SYSTEM:**



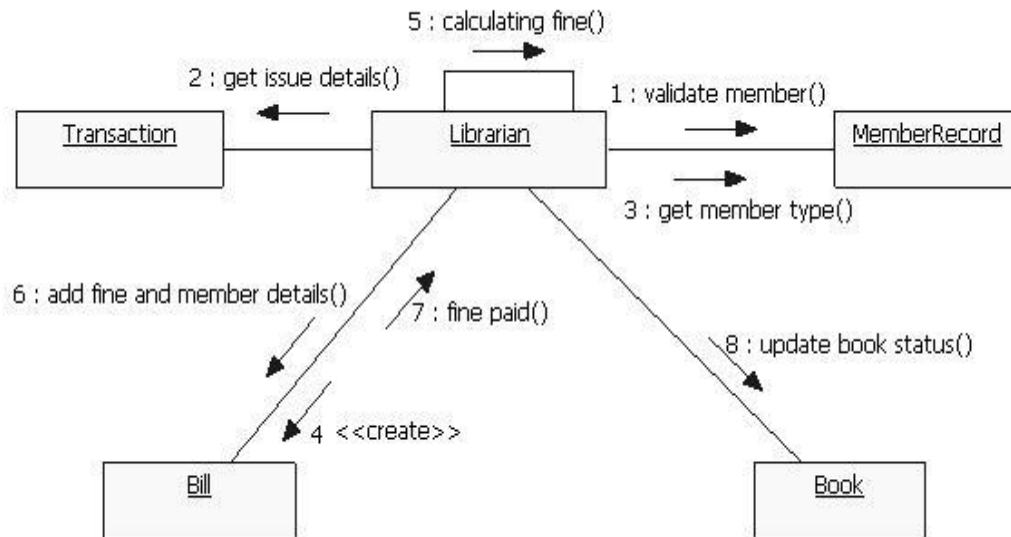
➤ **COMMUNICATION DIAGRAM FOR LIBRARY MANAGEMENT SYSTEM:**



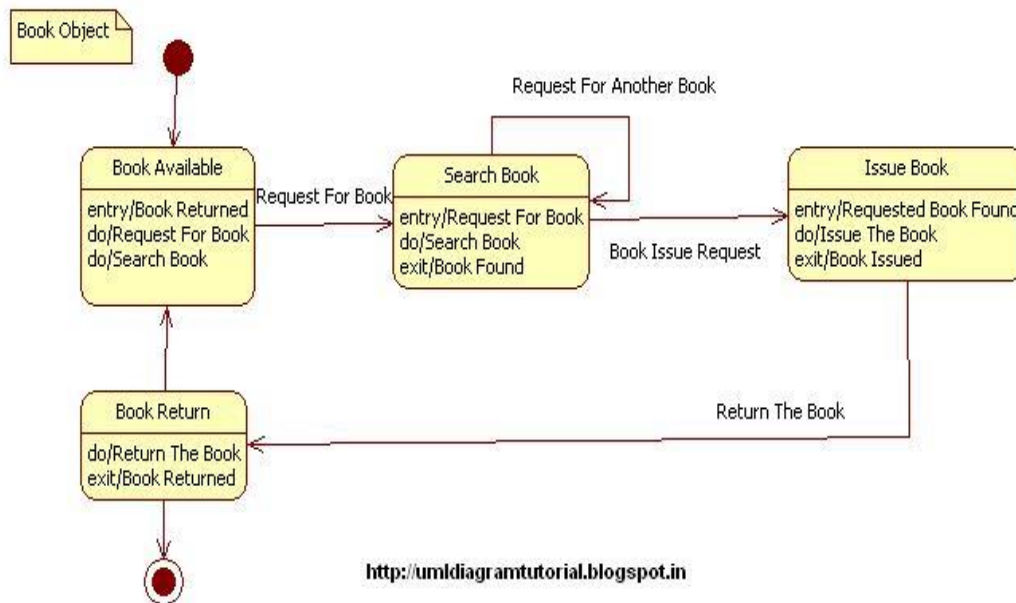
➤ **COLLABORATION DIAGRAM FOR LIBRARY MANAGEMENT SYSTEM ISSUE BOOK:**



➤ **COLLABORATION DIAGRAM FOR LIBRARY MANAGEMENT SYSTEM RETURNING BOOK:**

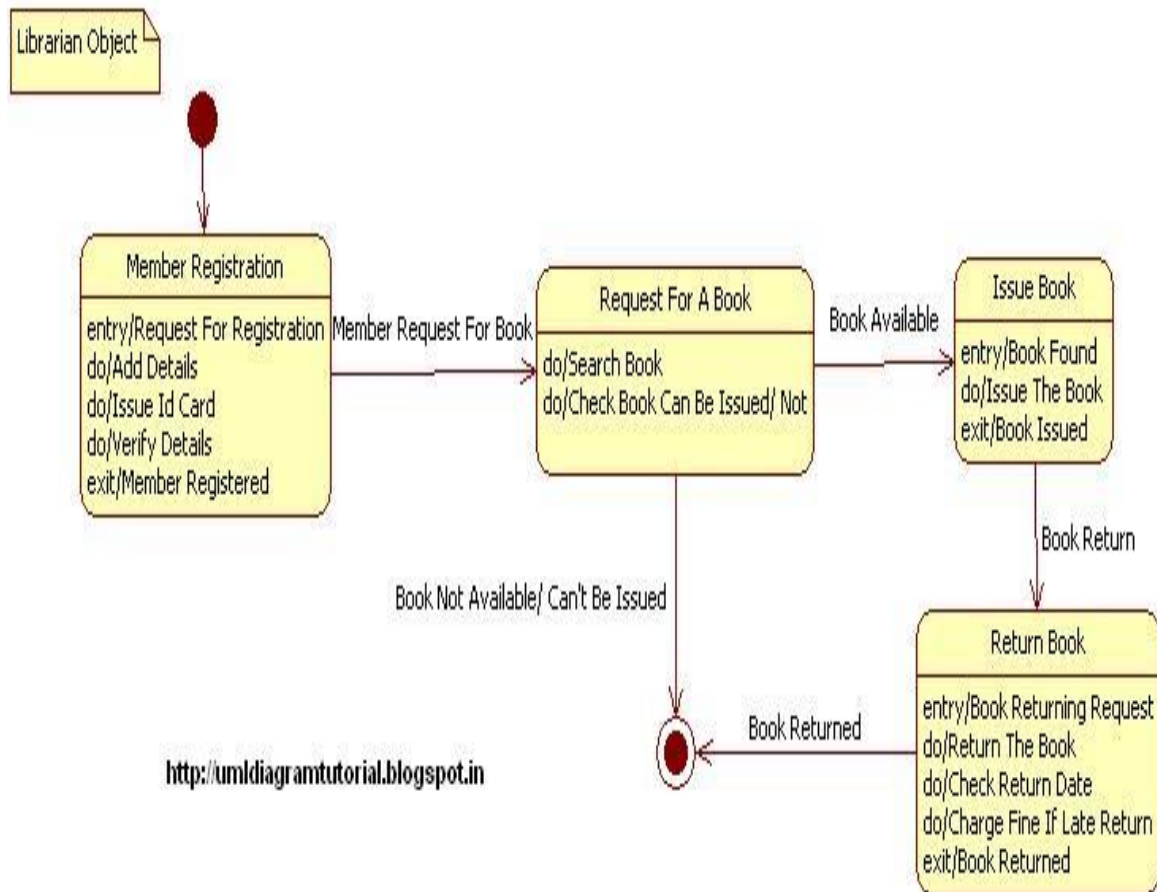


➤ **STATE DIAGRAM FOR LIBRARY MANAGEMENT SYSTEM (BOOK) :**



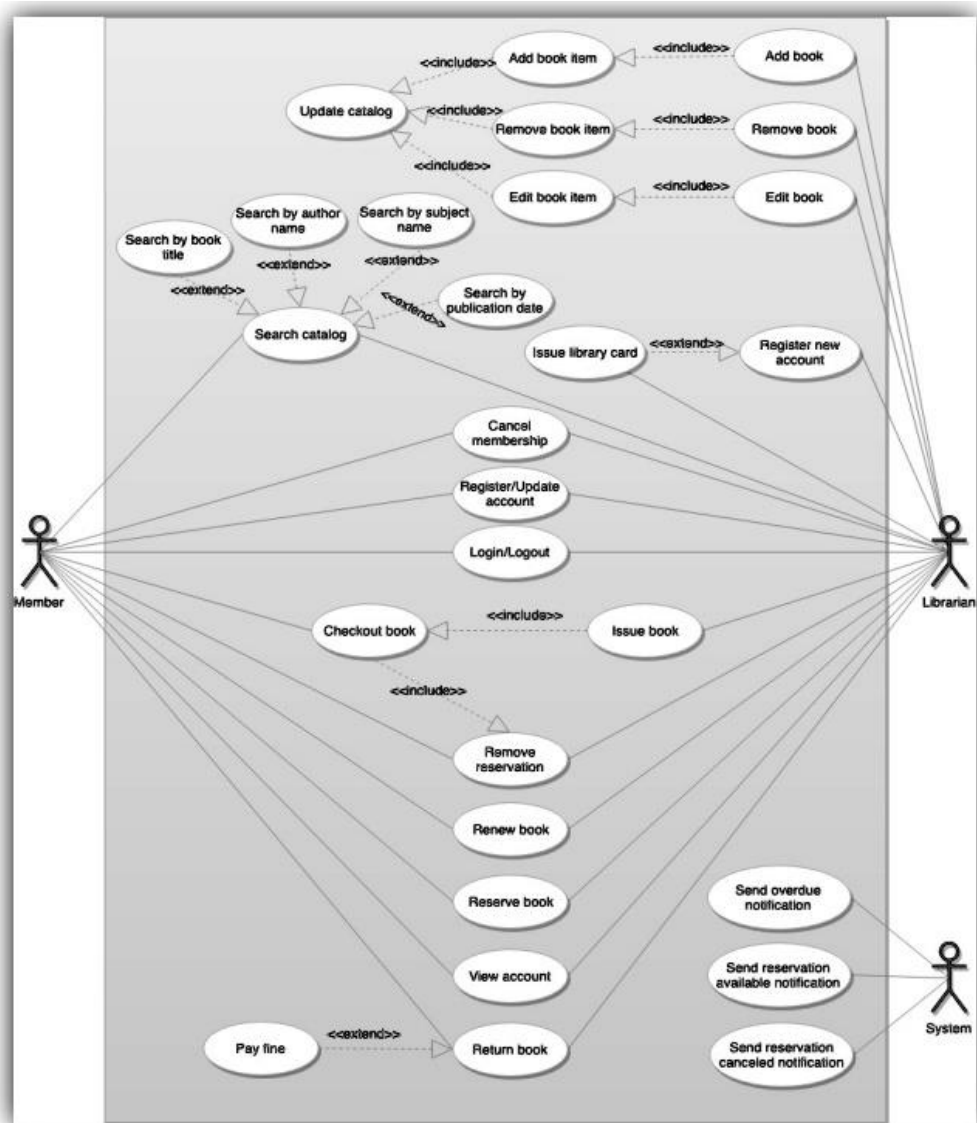
<http://umldiagramtutorial.blogspot.in>

➤ **STATE DIAGRAM FOR LIBRARY MANAGEMENT SYSTEM (LIBRARIAN OBJECT) :**

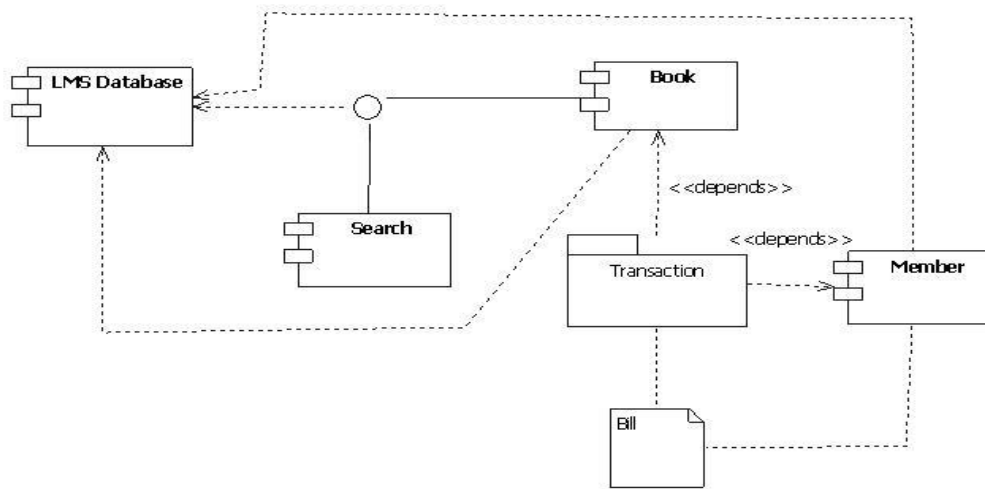




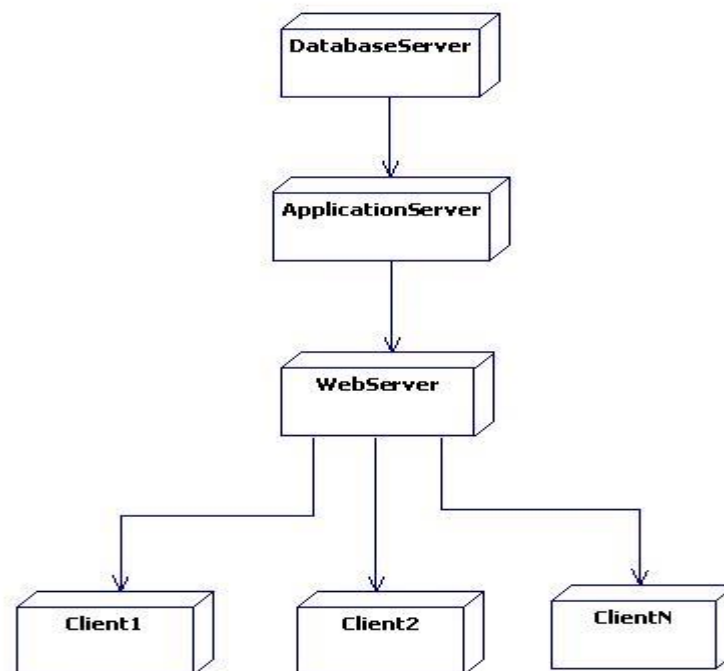
➤ USE CASE DIAGRAM FOR LIBRARY MANAGEMENT SYSTEM :



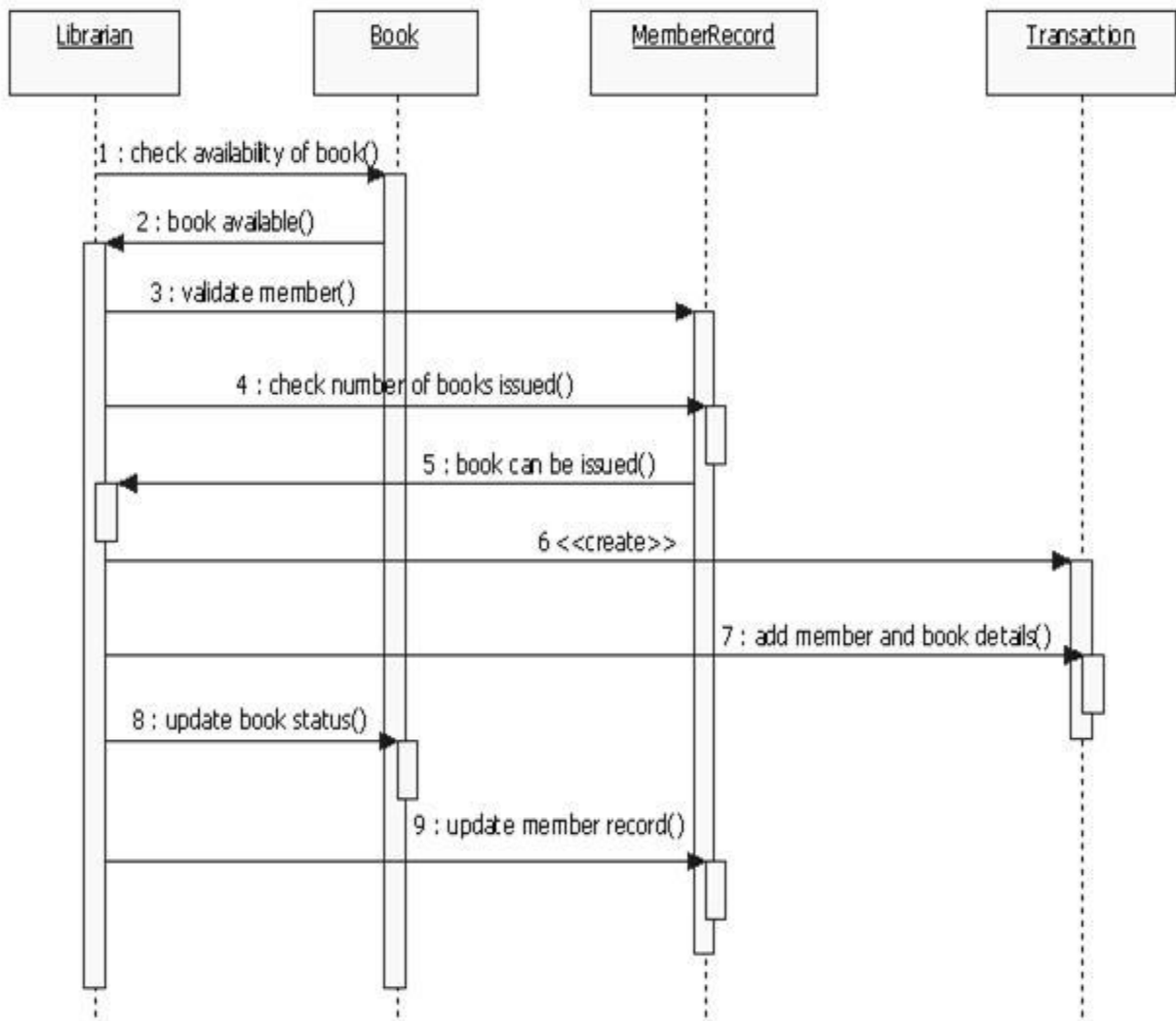
➤ **COMPONENT DIAGRAM FOR LIBRARY MANAGEMENT SYSTEM :**



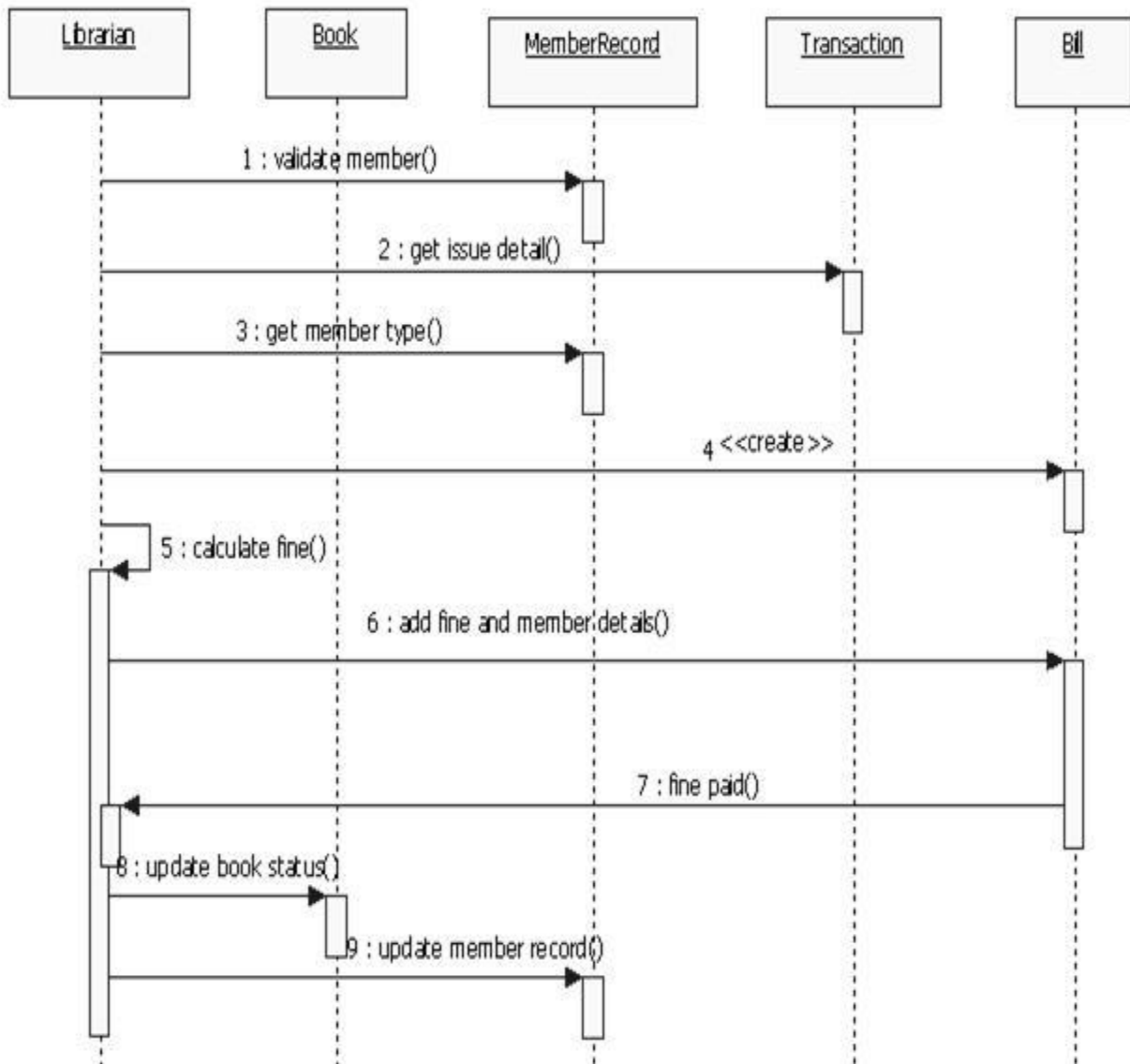
➤ **DEPLOYMENT DIAGRAM FOR LIBRARY MANAGEMENT SYSTEM :**



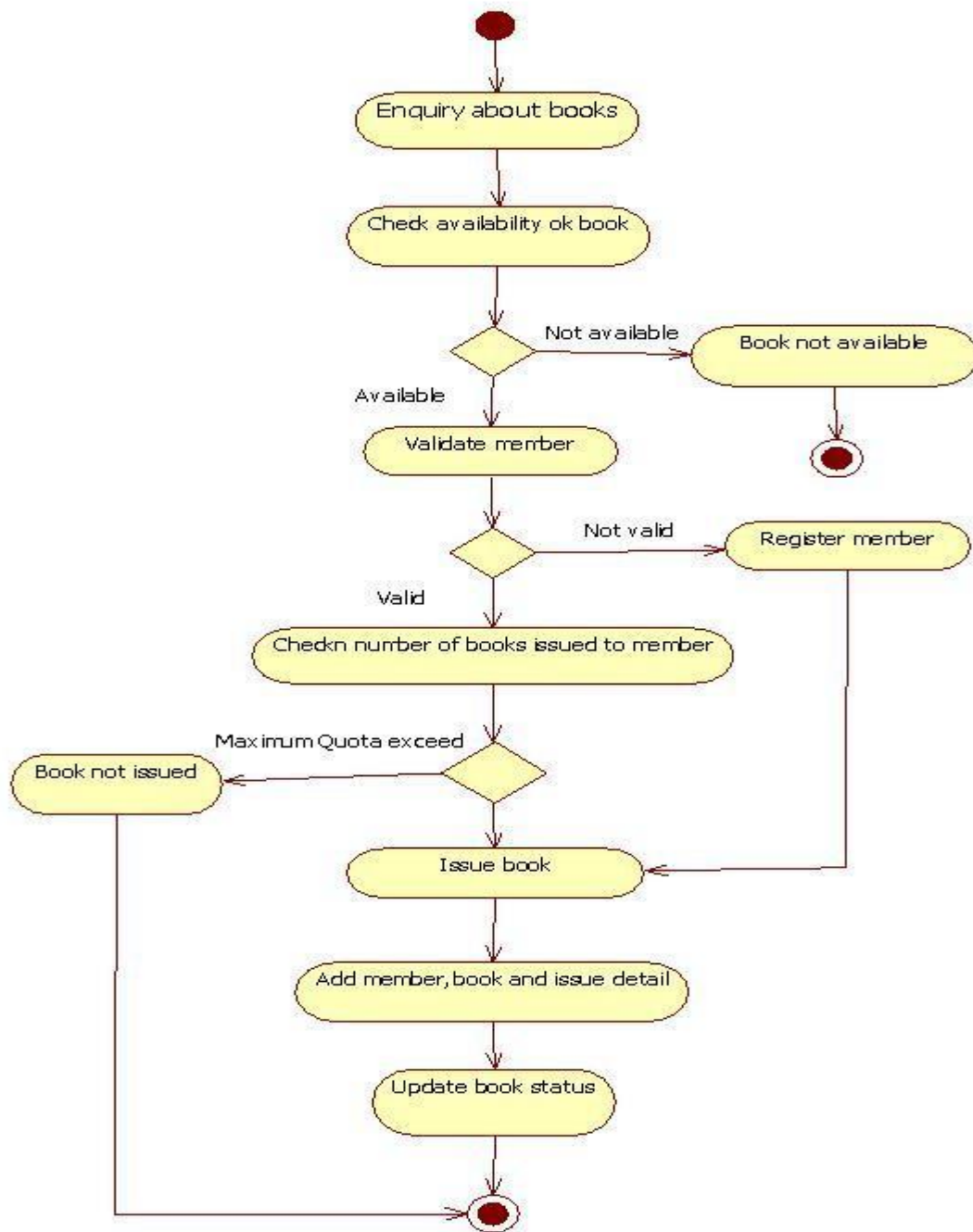
➤ **SEQUENCE DIAGRAM FOR LIBRARY MANAGEMENT SYSTEM (ISSUE BOOK)**  
:



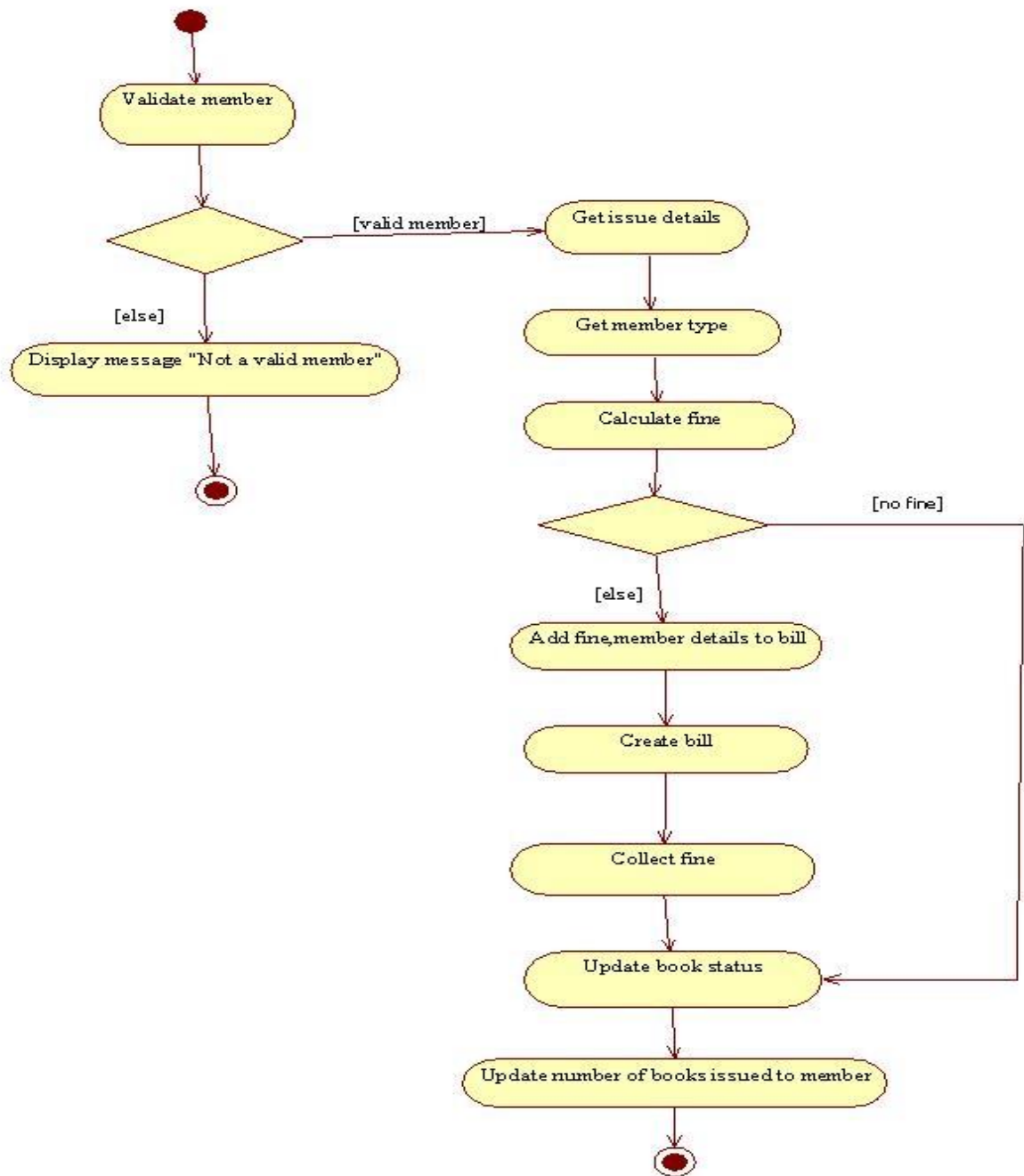
➤ **SEQUENCE DIAGRAM FOR LIBRARY MANAGEMENT SYSTEM (RETURNING BOOK) :**



➤ **ACTIVITY DIAGRAM FOR LIBRARY MANAGEMENT SYSTEM(ISSUE BOOK) :**



➤ **ACTIVITY DIAGRAM FOR LIBRARY MANAGEMENT SYSTEM(RETURNING BOOK) :**



## 5. SYSTEM DESIGN

### 5.1. FORM DESIGN

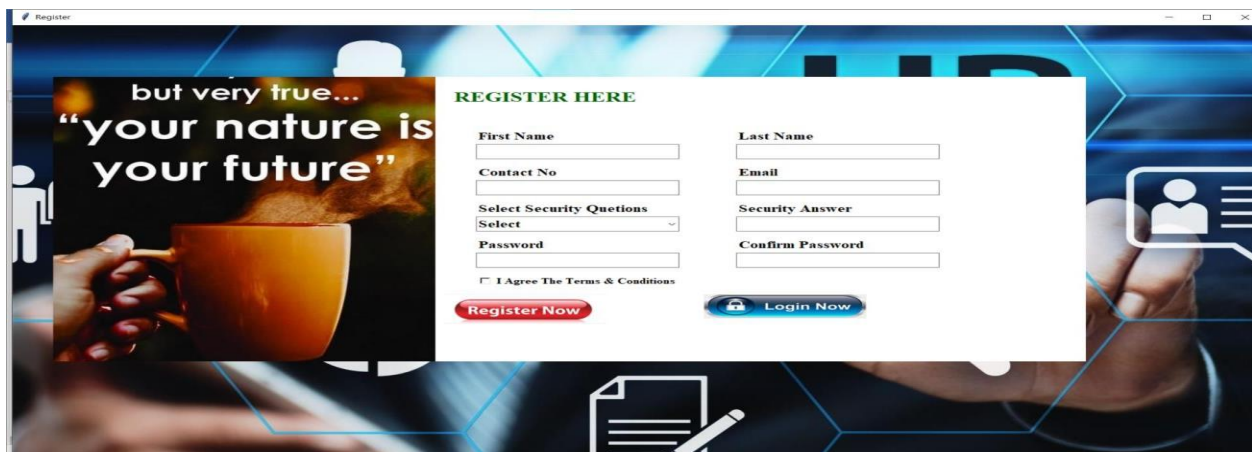
#### 1. Admin:

This is the Library Management System Login Form. You have to enter Username and Password on it. There are also options like New User Registration and Forget Password.

The screenshot shows a web browser window titled "Login Page". The main heading is "Library Management System" in red text on a yellow background. Below this is a large background image of a library interior with high ceilings and bookshelves. Overlaid on this is a dark grey login form. The form has a red circular icon with a white person silhouette at the top, followed by the text "Admin Login". Below this are two input fields: "Username" and "Password", each with a red circular icon containing a white person silhouette. A red "Login" button is positioned below the password field. At the bottom of the form, there are two links: "New User Register" and "Forget Password".

#### 2. Register:

This is the New User Registration Form of the Library Management System. The user needs a Username and Password to login to the system, and to create it, the user has to first register from here.

The screenshot shows a web browser window titled "Register". The background is a blue and black abstract design with a hand holding a glowing orange cup on the left. The main heading is "REGISTER HERE" in green text. Below this is a white registration form. The form has two columns of input fields: "First Name", "Contact No", "Select Security Questions" (with a dropdown menu), "Password", and "I Agree The Terms & Conditions" (with a checkbox) on the left; and "Last Name", "Email", "Security Answer", and "Confirm Password" on the right. At the bottom of the form are two buttons: a red "Register Now" button and a blue "Login Now" button with a white padlock icon.



### 3. Forget Password:

If a user forgets his Login Password, then from here he can create his new Password. For that, the user has to enter details like his Username, SecurityQuestion and Security Answer.

**Forget Password**

Select Security Questions  
Select

Security Answer

New Password

Reset

### 4. Home:

This is the Main Window of the Library Management System. From here the Admin uses this system.

**LIBRARY MANAGEMENT SYSTEM**

**Library Membership Information**

Member Type: Admin Staf  
PRN No: 789  
ID No: 457896  
First Name: 457896  
Surname: 457896  
Address1: 457896  
Address2: 457896  
Post Code: 457896  
Mobile Number: 457896  
Book Id: 457896  
Book Title: 457896  
Author Name: 457896  
Date Borrowed: 457896  
Date Due: 457896  
Days On Book: 457896  
Late Return Fine: 457896  
Date Over Due: 457896  
Actual Price: 457896

**Book Details**

Head Firt Book  
Learn Python The Hard  
Python Programming  
Secrete Rahshy  
Python CookBook  
Intro to Machine Learnin  
Fluent Python  
programming Python  
The Algorithm  
The tecnich Python  
Machine tecno  
My Python  
Joss Ellif guru  
Elite Jungle python  
Jungli Python  
Mumbai Python

**ADD DATA** **SHOW DATA** **UPDATE** **DELETE** **RESET** **EXIT**

Member Type	Reference No.	Title	First Name	Last Name	Address1	Address2	Post ID	Mobile Number	Book ID	Book Title	Author	Date Of Borrowec	Date Due	Da
Admin Staf	123	456	Ketan	Mahalle	Wardha	Nagpur	442001	9511760975	BKID8796	Intro to Machine	Sarah Guaido	2022-04-22	2022-05-07	15
Admin Staf	789	012	Pratik	Dhale	Wardha	Nagpur	442001	7666547208	BKID8796	Basic Of Pythpn	ZED A.SHAW	2022-04-22	2022-05-07	15
Admin Staf	457896	45789	Dhruva	Rathi	Delhi	Mumbai	214578	3214567890	BKID8796	Basic Of Pythpn	Ref.Kapil Kamble	2020-12-17	2021-01-01	15
Lecturer	548855	2155	kk	jjj	44554	jjj	kjk	2155488532	BKID1245	Intro to python C	John Zhelle	2021-01-20	2021-02-04	15



## 5.User Details:

This is the Library Management System User Details Form. This form shows the user details such as First name, Last Name, Contact, Addresses and other details to the Administrator.

Library Management System
10:18:15 PM

# LIBRARY MANAGEMENT SYSTEM

### Library Membership Information

Member Type: Admin Staf
Book Id: BKID1245
PRN No:
Book Title: Intro to python Comp Science
ID No:
Auther Name: John Zhelle
FirstName:
Date Borrowed: 2022-04-25
Surname:
Date Due: 2022-05-10
Address1:
Days On Book: 15
Address2:
Late Return Fine: Rs.25
Post Code:
Date Over Due: NO
Mobile Number:
Actual Price: Rs.500

### Book Details

Head Firt Book  
Learn Python The Hard  
Python Programming  
Secrete Rahshy  
Python CookBook  
Intro to Machine Learnin  
Fluent Python  
progmming Python  
The Algorithm  
The tecnich Python  
Machine tecno  
My Python  
Joas Ellif guru  
Elite Jungle python  
Jungli Python  
Mumbai Python

Member Type: Admin Staf  
PRN No:  
ID No:  
FirstName:  
LastName:  
Address1:  
Address2:  
Post Code:  
Mobile No:  
Book ID: BKID1245  
Book Title: Intro to python Co  
mp Science  
Auther: John Zhelle  
DateBorrowed: 2022-04-25  
DateDue: 2022-05-10  
DaysOnBook: 15

ADD DATA
SHOW DATA
UPDATE
DELETE
RESET
EXIT

Member Type	Reference No.	Title	First Name	Last Name	Address1	Address2	Post ID	Mobile Number	Book ID	Book Title	Auther	Date Of Borrowec	Date Due	Da
Admin Staf	123	456	Ketan	Mahalle	Wardha	Nagpur	442001	9511760975	BKID8796	Intro to Machine	Sarah Guido	2022-04-22	2022-05-07	15
Admin Staf	789	012	Pratik	Dhale	Wardha	Nagpur	442001	7666547208	BKID8796	Basic Of Python	ZED A.SHAHAW	2022-04-22	2022-05-07	15
Admin Staf	457896	45789	Dhruva	Rathi	Delhi	Mumbai	214578	3214567890	BKID8796	Basic Of Python	Ref.Kapil Kamble	2020-12-17	2021-01-01	15
Lecturer	548855	2155	kk	jjj	44554	jjj	kjjk	2155488532	BKID1245	Intro to python C	John Zhelle	2021-01-20	2021-02-04	15

## 5.2. INPUT SCREEN AND OUTPUT SCREEN

### 1.Registration

#### Input:

The User or Admin has to first register to use the Library Management System. This is the Registration input screen, in which the user has to enter some details to generate his Username and Password. After entering the details, the user has to tick (✓) 'I Agree the Terms and Conditions' option and then click on the 'Register Now' button.

but very true...  
"your nature is your future"

**REGISTER HERE**

First Name: Ketan  
Last Name: Mahalle  
Contact No: 9511760975  
Email: ketanmahalle07@gmail.com  
Select Security Questions: Your Birth Place  
Password: 12345  
Security Answer: Wardha  
Confirm Password: 12345  
☒ I Agree The Terms & Conditions  
**Register Now** **Login Now**

#### Output:

When the User or Admin clicks on the Register Now button, he will see the message 'Registration Successful'.

but very true...  
"your nature is your future"

**REGISTER HERE**

First Name: Ketan  
Last Name: Mahalle  
Contact No: 9511760975  
Email: ketanmahalle07@gmail.com  
Select Security Questions: Your Birth Place  
Password: 12345  
Security Answer: Wardha  
Confirm Password: 12345  
☒ I Agree The Terms & Conditions  
**Register Now** **Login Now**

Success  
Register Successfully  
OK

# **SOFTWARE 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

## **6.1. 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

Unit testing was done on each module that is described under module description of chapter 4

### **➤ 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 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

➤ **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, 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 librarian, 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.

## **6.2. 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.

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

### **CONCLUSION:**

This website 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.

### **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.



