Name of Student:

Date of Performance: **Date of Completion:**

Experiment No: 1

Title: Designing a Library Management System

Aim: To Design a Library Management System

Requirements: Single Computer (preferably Pentium IV+) and any Open Source/Freeware/Shareware CASE Tool for Analysis & Design

Prelab:

Problem Definition

The Library Management System (LMS) implements databases to make the existing system more efficient. It is difficult to catch defaulters in a usual library system, but LMS solves this problem by providing messages to the administrator about the fine to be paid and books to be returned. When a book is to be borrowed, it's barcode is read and is fed to LMS. When the administrator tries to issue a book to a member, LMS checks whether the member is allowed to borrow books respective to his limit. LMS also checks whether the book to be issued is a reference book or not. If the book is a reference book, it cannot be issued. If the book has no restrictions it is issued to the member and also the member's details is updated with the books that he has just borrowed. Any member can search a book with its title name or author's name.

Software Requirement Specification

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.

Scope

The document only covers the requirements specifications for the Library Management System. This document does not provide any references to the other component of the Library Management System. All the external interfaces and the dependencies are also identified in this document.

Feasibility study

The overall scope of the feasibility study was to provide sufficient information to allow a decision to be made as to whether the Library Management System project should proceed and if so, its relative priority in the context of other existing Library Management Technology.

The feasibility study phase of this project includes various steps which as describe as under:

- Identity the origin the information at different level.
- Identity the expectation of user from computerized system.
- Analyze the drawback of existing system (manual system)

Overview

The implementation of Library Management starts with entering and updating master records like book details, library information. Any further transaction like book issue, book return will automatically update the current books.

Product Perspective

The proposed Library Management System will take care of the current book detail at any point of time. The book issue, book return will update the current book details automatically so that user will get the update current book details.

Software requirement

Front end: Android developer tool ,Advance java

Back end: MySQL

Hardware requirement

Android version 2.3 ginger bread(minimum, android user's), 2GB ram,1.2 GHz processor, Intel i5,Windows 7/8/8.1/10

Product function

- The main purpose of this project is to reduce the manual work.
- This software is capable of managing Book Issues, Returns and Calculating/Managing fine. Generating various Reports for Record-Keeping according to end user requirements.

Specific Requirement External Interface Requirement

The interface should be simple, easy to understand and also must be interactive. The system should prompt for the user and administrator to login to the application and for proper input criteria.

User Interface

The software provides good graphical interface for the user any administrator can operate on the system, performing the required task such as create, update, viewing the details of the book.

- ✓ Allows user to view quick reports like Book Issues/Returned etc in between particular time.
- ✓ Stock verification and search facility based on different criteria.

Communication interface

Window

Functional requirements

- **Book entry**: In this module we can store the details of the books.
- **Register student**: in this module we can keep the details of the new student.
- **Book issue**: This module is used to keep a track of book issue details.
- **Book return**: This module enables to keep a track of return the books.

➢ **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 are 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.

➢ **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.

➢ **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 renewed if then fine will be applied by Rs 10 per day.

Non Functional Requirements

- **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 capability of the computer depends on the performance of the software. The software can take any number of inputs provided the database size is larger enough. This would depend on the available memory space

- **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.

User characteristics

We have 2 levels of users

- **User module**: In the user module, user will check the Availability of the books

Book return

- **Administration module**: The following are the sub module in the administration module.
  - Register user
  - Entry book details
  - Book issue

General Constraints

Any update regarding the book from the library is to be recorded to have update & correct values.

Design constraints

Each member will be have an identity card which can be used for the library book issue, fine payment etc. whenever library member wishes to have a book, the book issued by the library authority will check both the book details as well as the student details and store it in library database. In case of retrieval of book much of human intervention can be eliminated.

System architecture

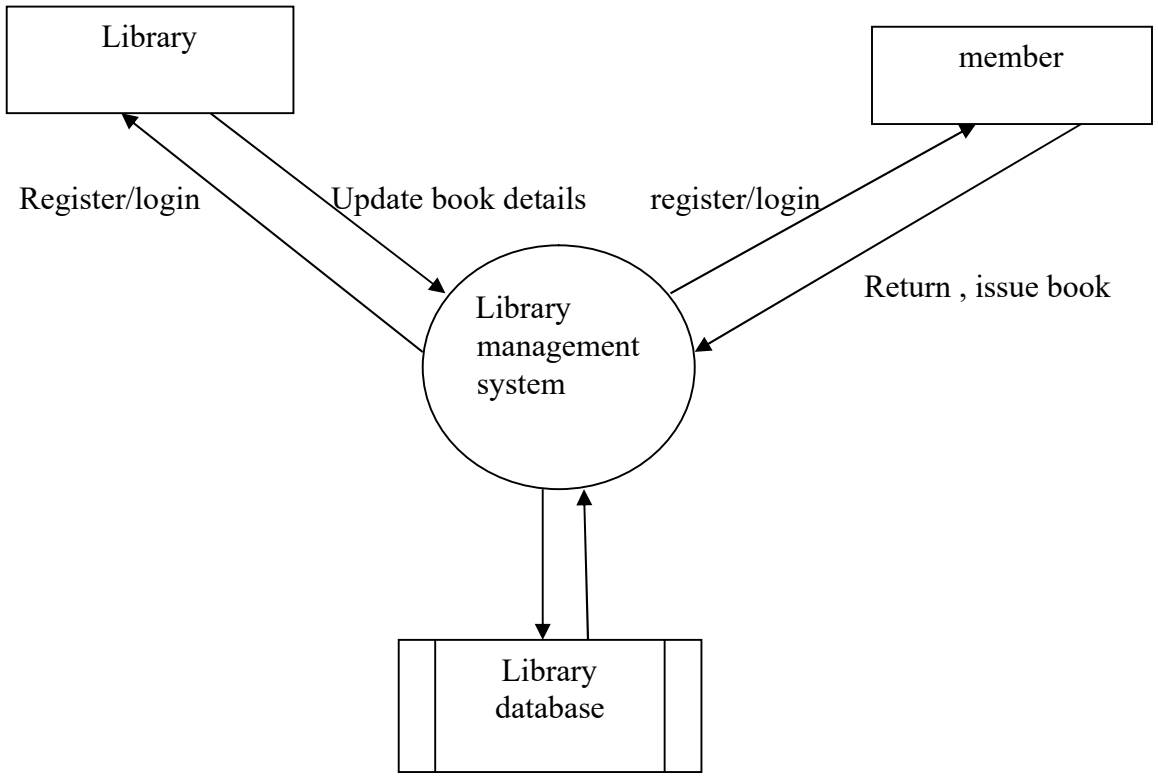

Fig 1: system architecture diagram of library management system

System Development Model:

system design is the process of defining the architecture, components, modules, interface, and data for a system to satisfy specified requirement through system modelling. One could see it as the application of system theory to produce development. The design of this system will be user friendly. It shall be designed in such a way that employees will be able to navigate easily through the information supplied on the system. In other words, system design consists of design activities that produces system specification satisfying the functional requirement that were developed in the system analysis process. System design specifies how the system will accomplish. System design is the structural implementation of the system analysis.

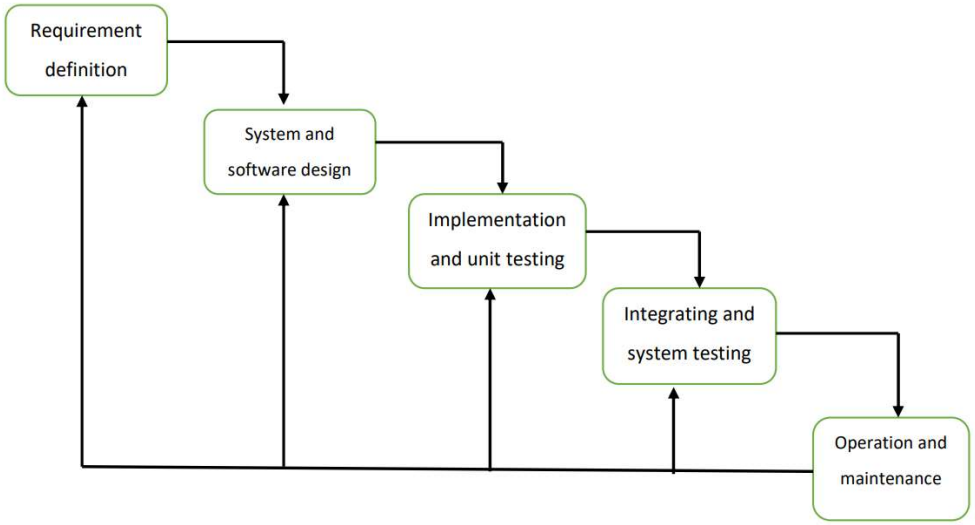

Fig 2: waterfall model

The diagram above is a system development life cycle that illustrate how the design of the project is broken down into five different phases, requirement definition, system and software design, implementation and unit testing, integrating and system testing, operation and maintenance.

The purpose library management system library and store will start with project planning by determining the user of the system, aims and objective of the project. After these, extensive research will be done to determine how to design an effective system, as well as to review the current system. Then the design was with an initial prototype of the system, and then refined it based on their suggestion. Phases of analysis, design and implementation were performed iteratively until users and designers agreed on a final system specification. At this point, the project could move to final implementation phase.

Inlab:

The UML diagrams developed during the laboratory session for Library Management System are as follows:

1. Data flow diagram(DFD):

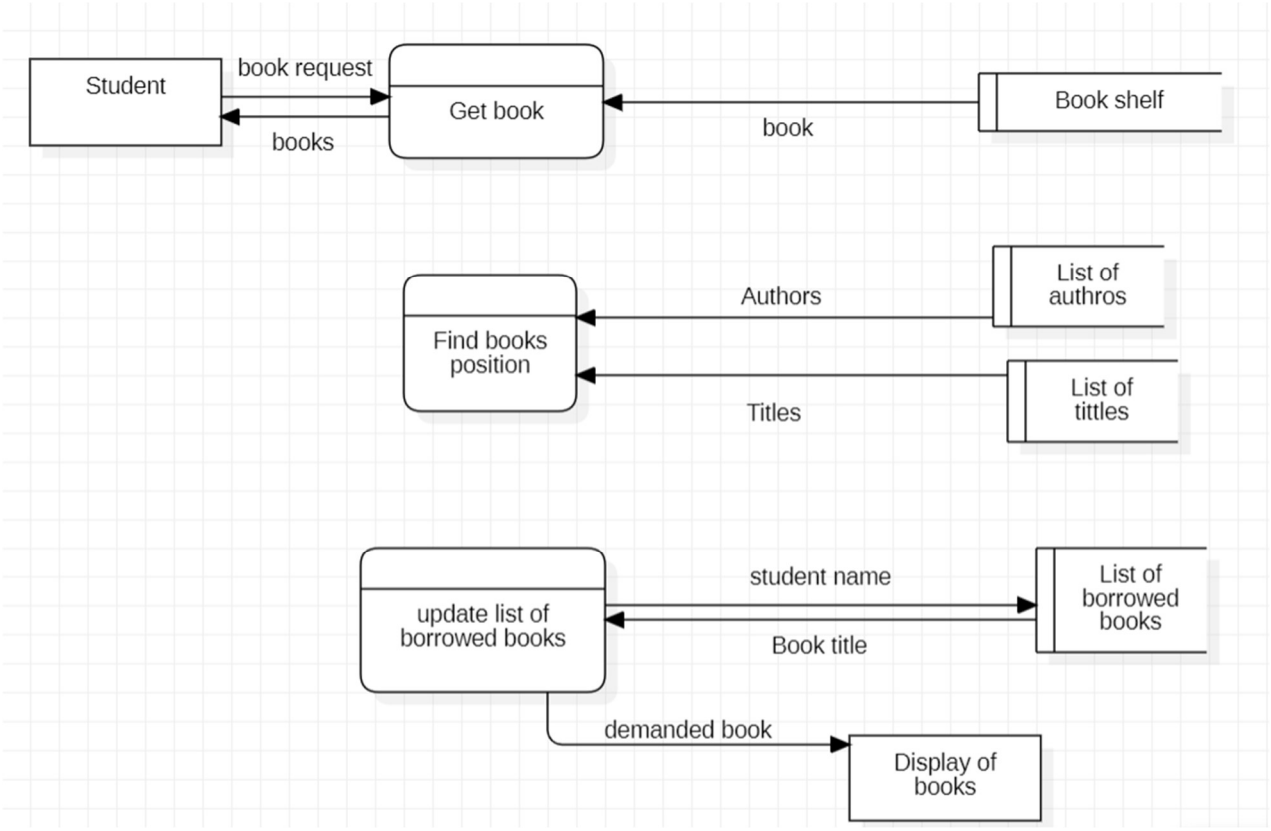

Fig 3: Data flow diagram of Library Management System

2. Use case diagram:

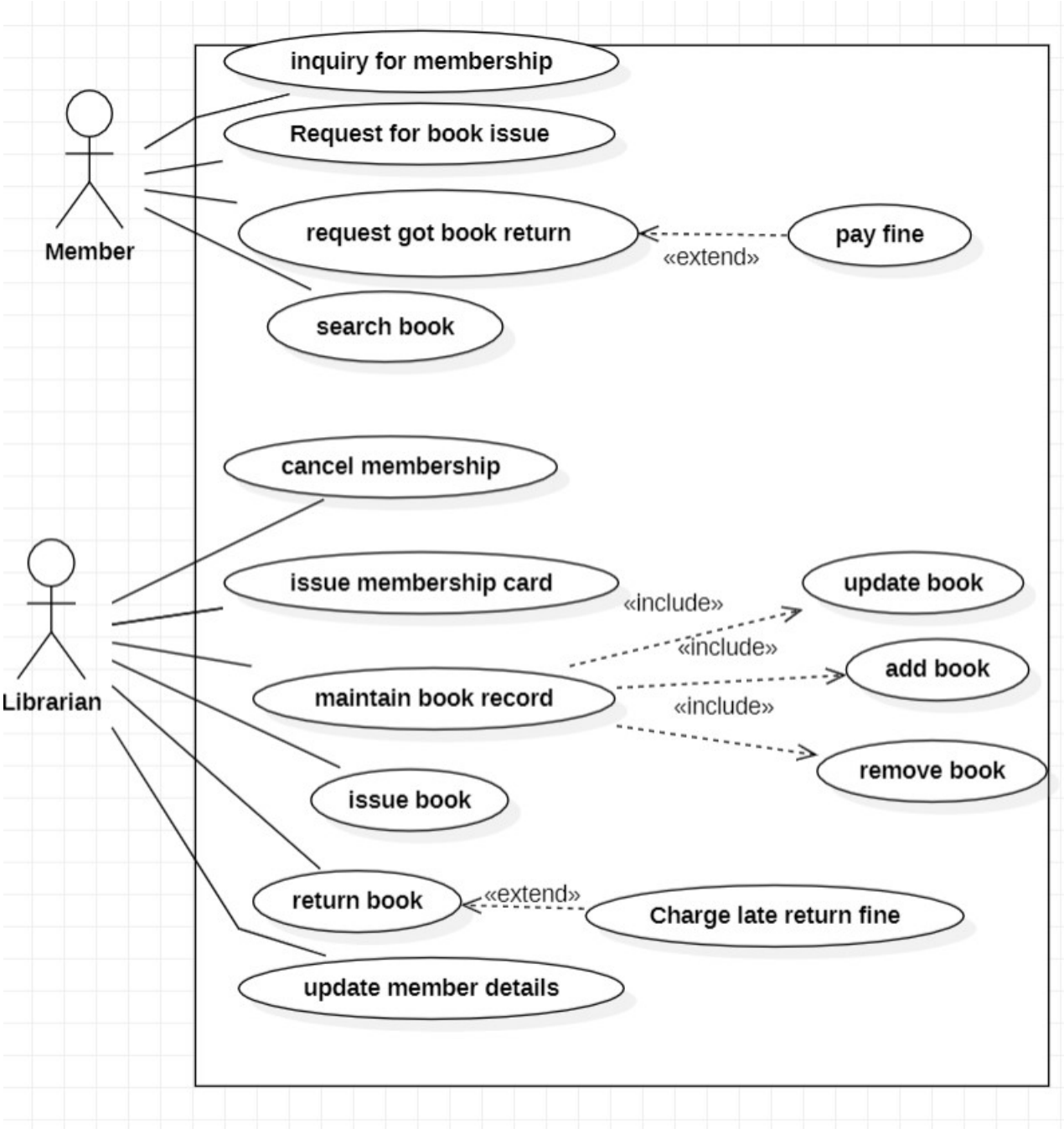

Fig 4: Use case diagram of Library Management System

3. Class diagram:

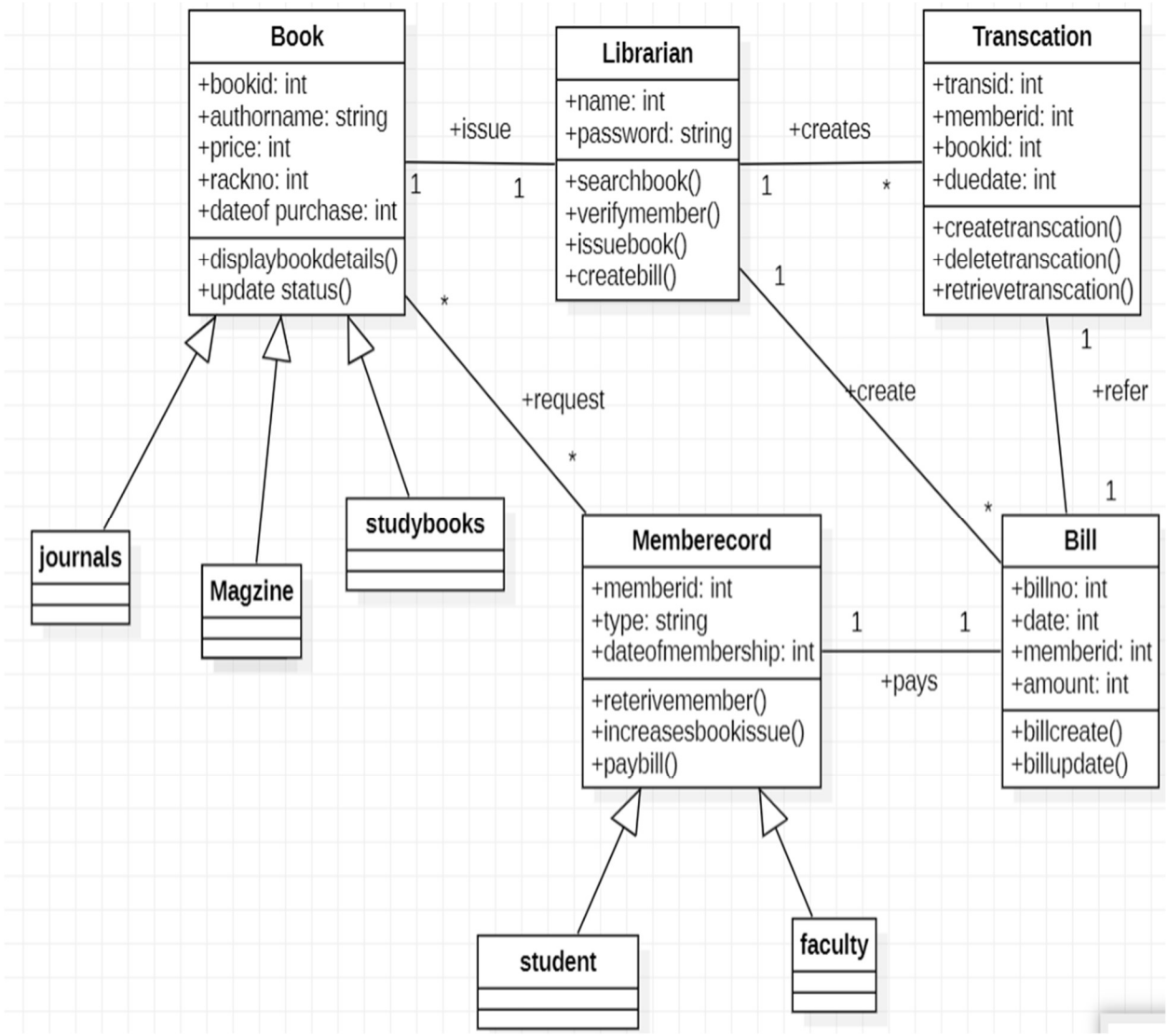

Fig 5: Class diagram of Library Management System

4. Sequence diagram:

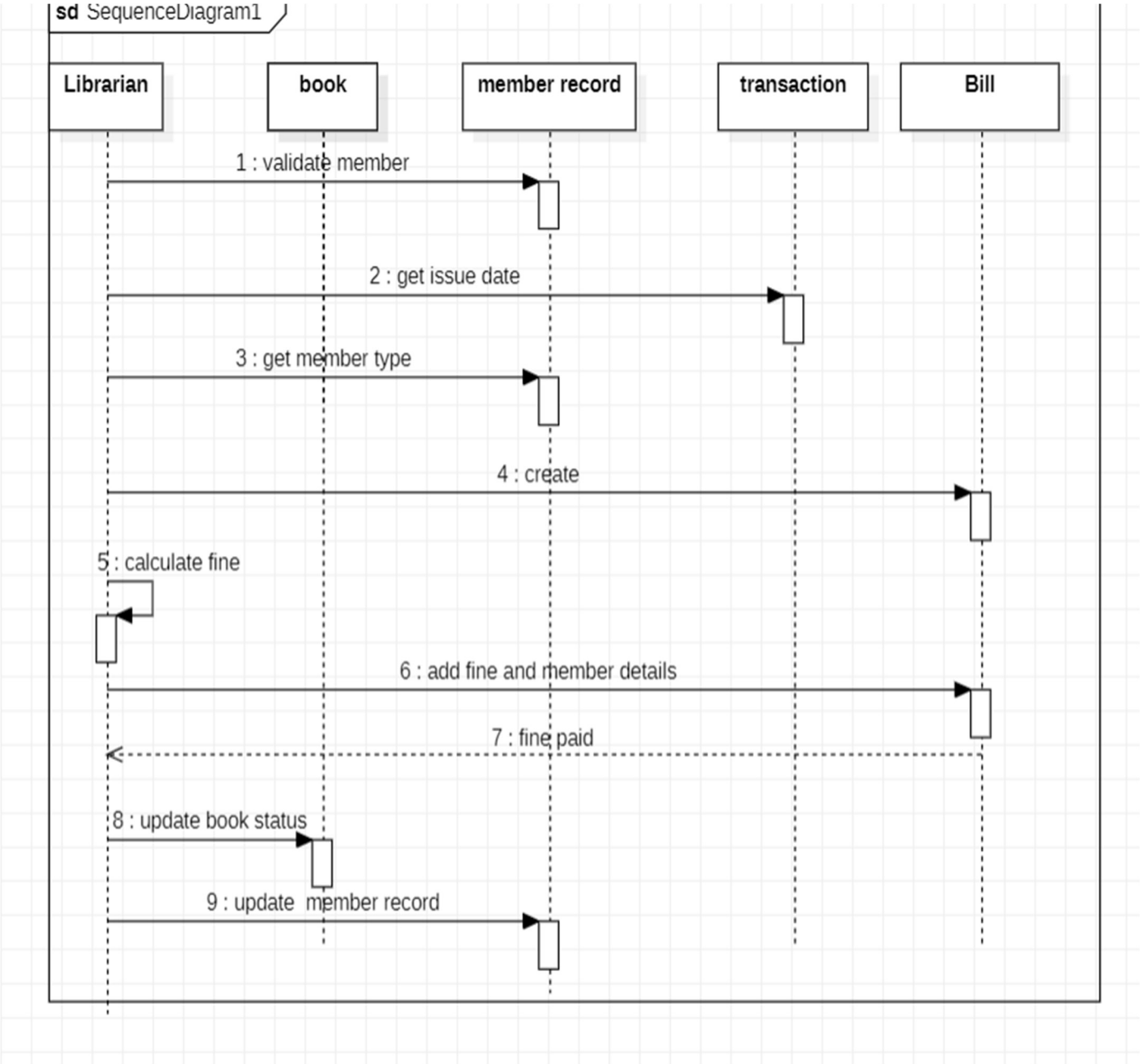

Fig 6: Sequence diagram of Library Management System

5. Collaboration/ communication diagram:

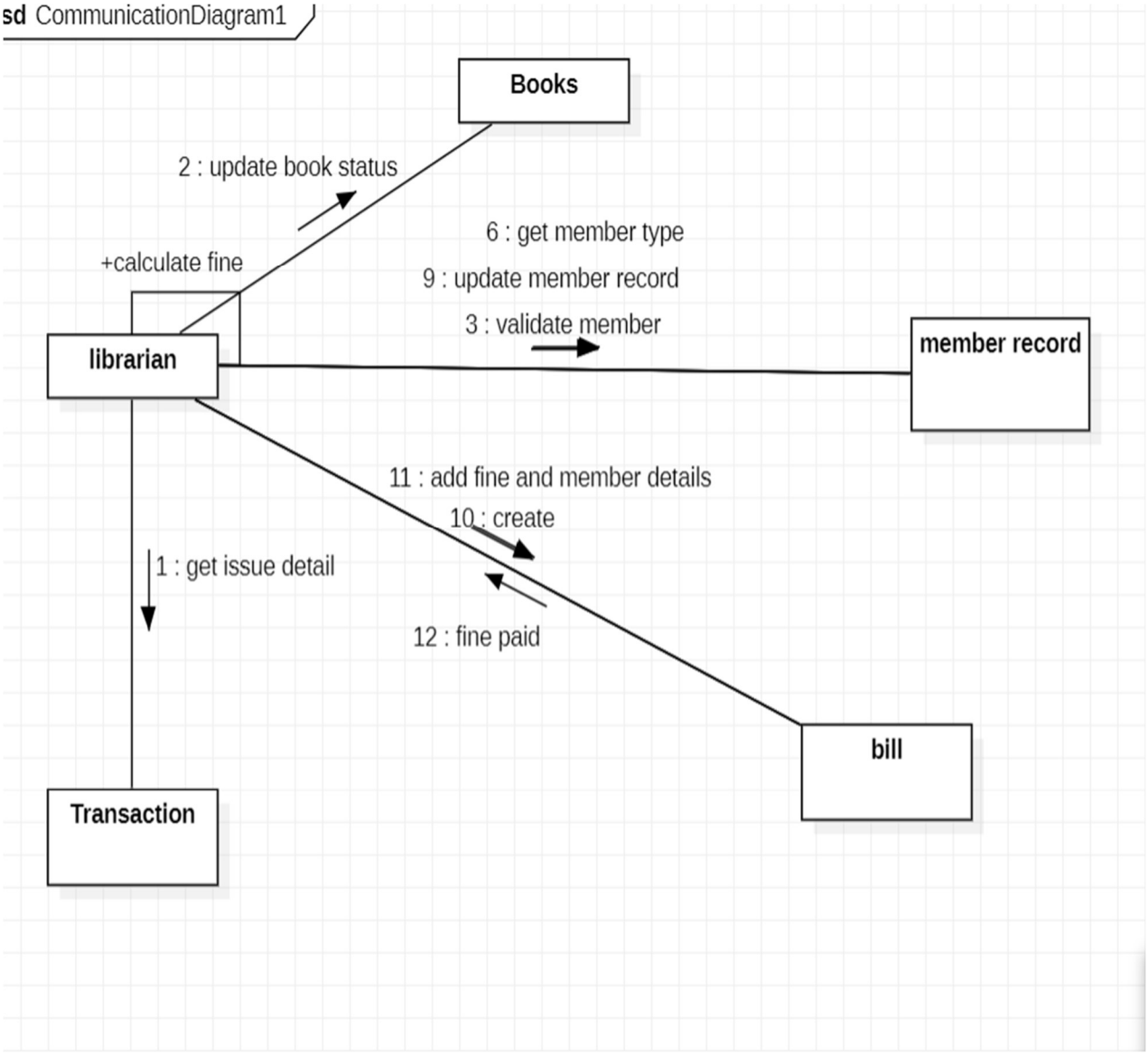

Fig 7:collaboration diagram of Library Management System

6. State chart diagram:

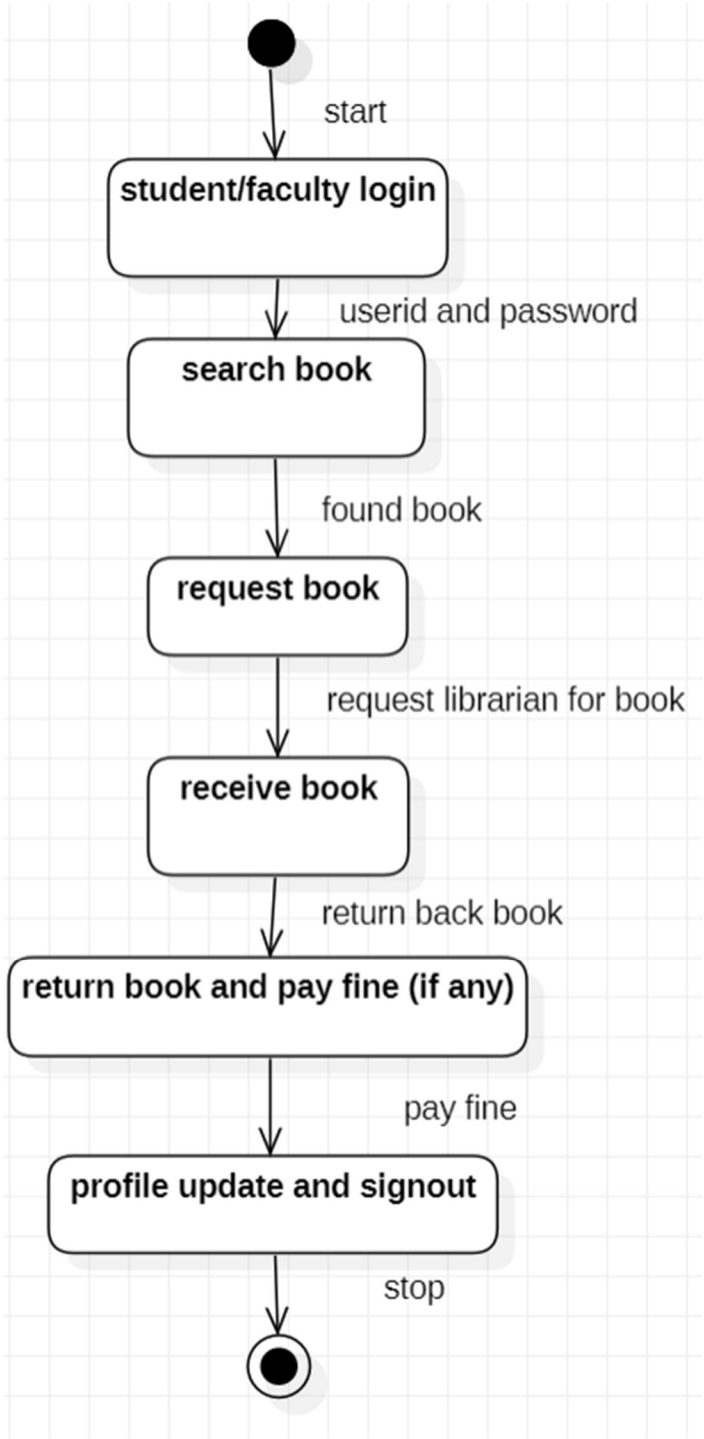

Fig 8:state chart diagram of Library Management System

7. Activity diagram:

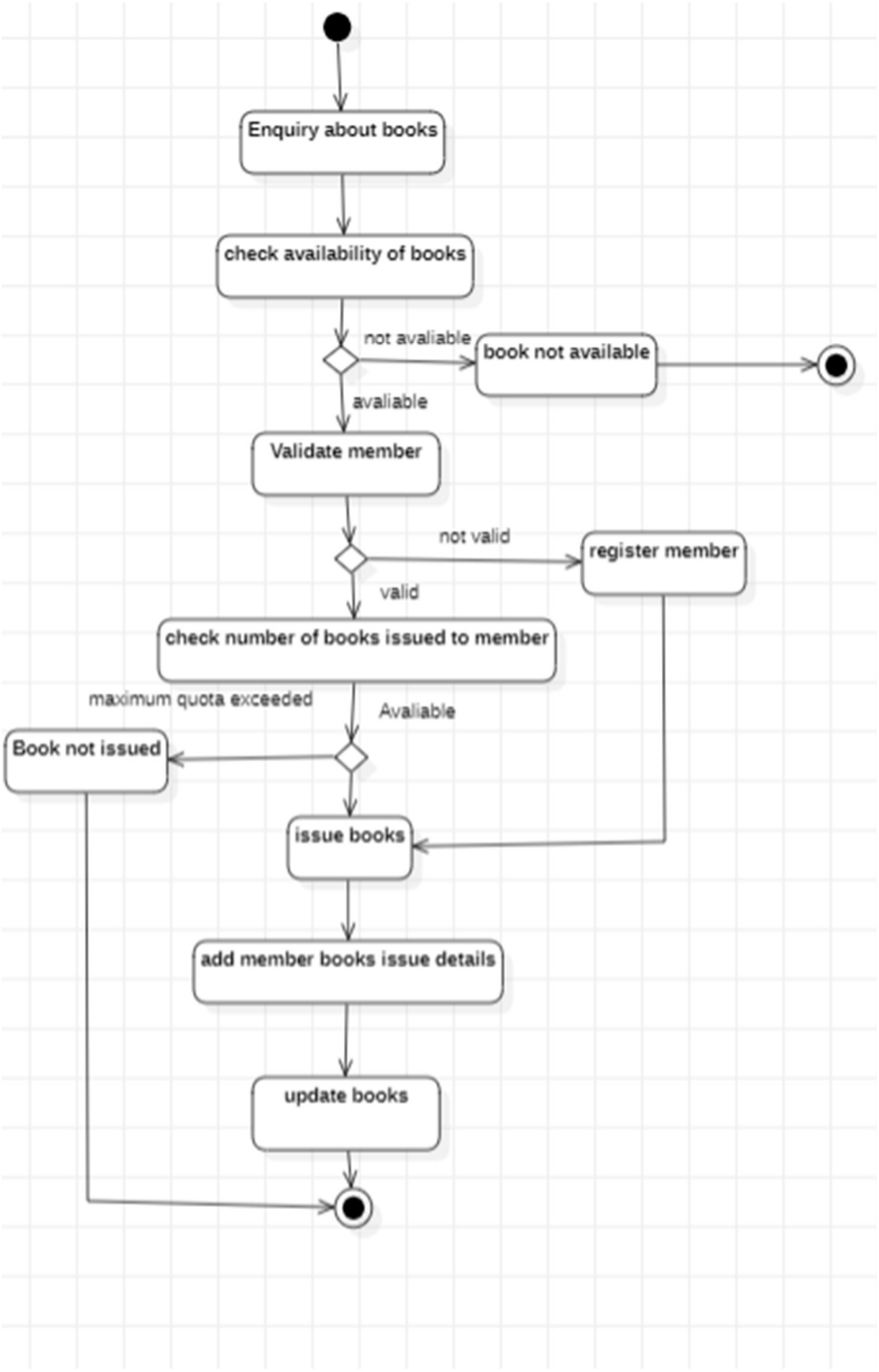

Fig 9: Activity diagram of Library Management System

8. Component diagram:

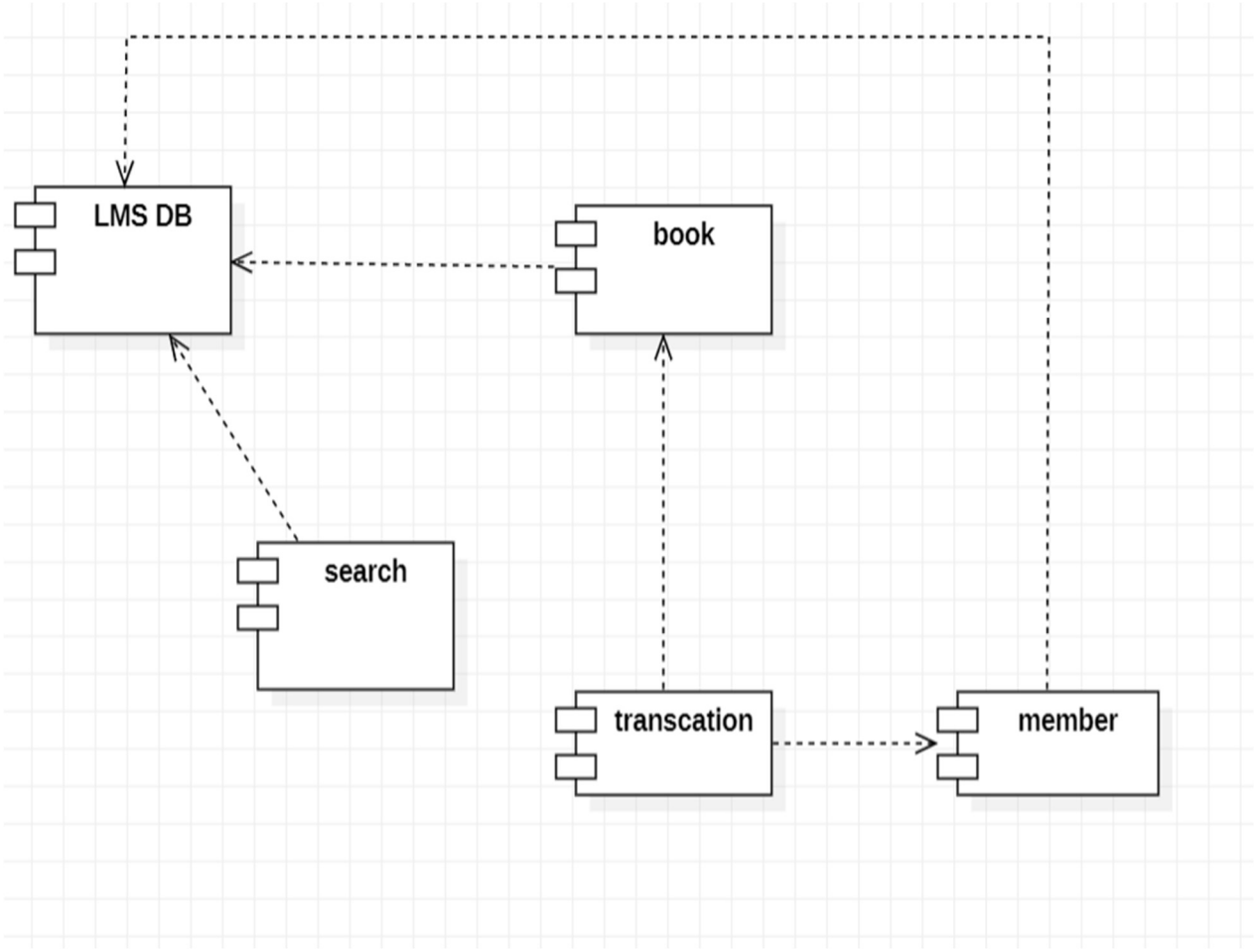

Fig 10: Component diagram of Library Management System

9. Deployment diagram:

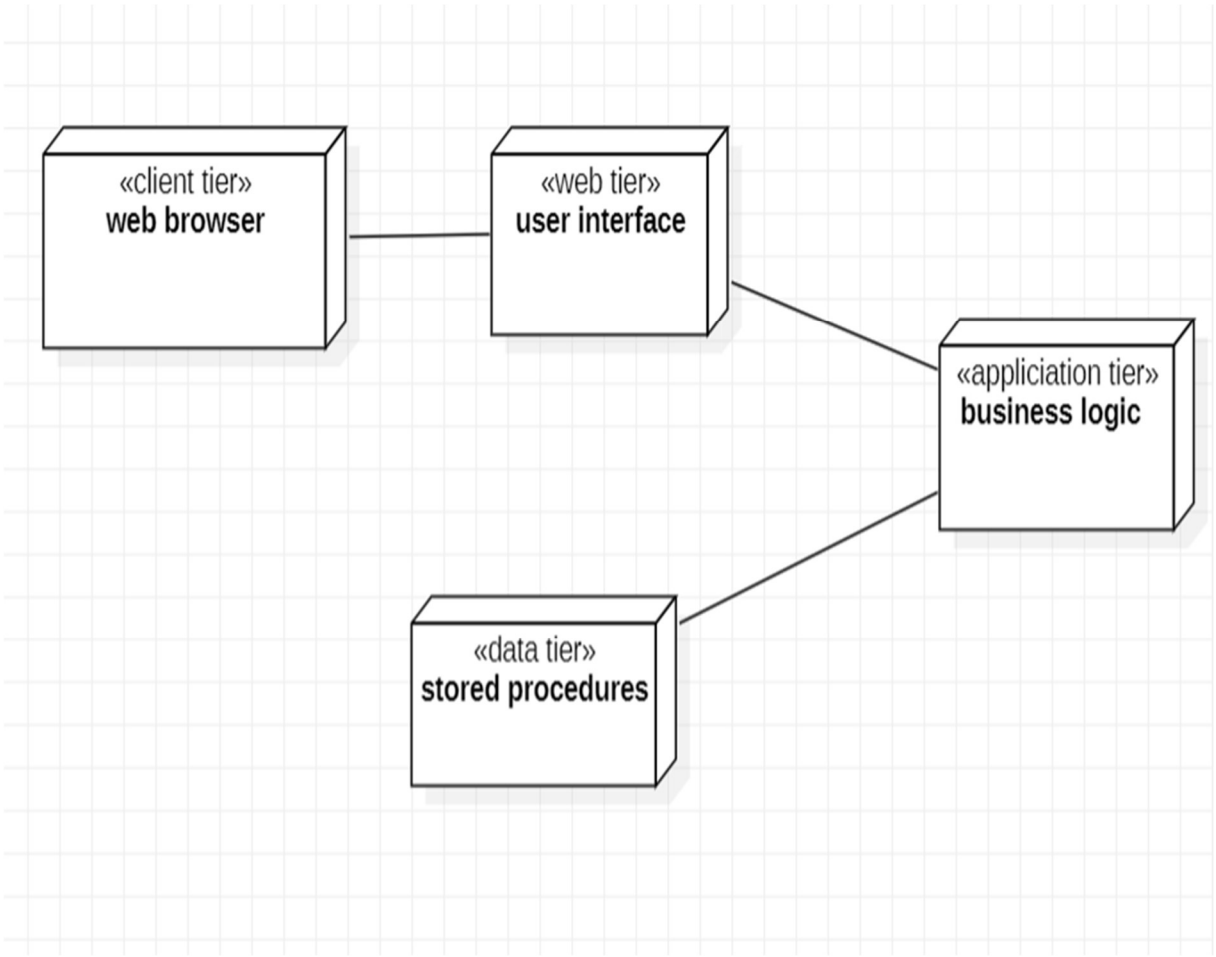

Fig 11: Deployment diagram of Library Management System

Questions

Name:

Class:

Section:

Roll No:

Signature:

Q. 1)What are the Actors used in use case diagram of LMS System?

Q. 2)What are the Objects used in Sequence diagram of LMS System?

Q. 3) What kind of relationship is used in the Class diagram of LMS System?

Q. 4) What do you mean by Include and Extends relationship?

Q. 5) List all states of the Object shown in the State diagram of LMS System.