

Experiment I

29/8/23

Aim:

Problem statement for a Library management system.

Problem statement:

A college library management is the project that manages and stores books information electronically according to student's needs. The system helps both student and library manager to keep a constant track of all the book available in library. It allows both the admin and the student to search for the desired book. It becomes necessary for colleges to keep a continuous check on the book issue and returned and even calculate fine. This task if carried out manually will be tedious and includes chances of mistakes. These errors are recorded by allowing the system to keep track of information such as issue date, last date to return the book and even fine information and thus there is no need to keep manual track of this information which thereby avoids chances of mistakes. Thus, this system reduces manual work to a great extent and allows smooth flow of library activities by removing chances of errors in details.

The requirement is to develop a system that will manage information about the entire system.

Challenges

- 1) Manual Book Tracking
- 2) Ineffective member Management
- 3) Limited Accessibility.
- 4) Inefficient reporting
- 5) Security concerns.

Objectives

- 1) Automated Book Tracking
- 2) Efficient member management
- 3) Enhance Accessibility
- 4) Comprehensive reporting
- 5) Improved security.

Expected outcomes

- 1) Increase operational efficiency
- 2) Enhance member experience
- 3) Informed decision making
- 4) Security and confidentiality.

Conclusion :- Problem statement of Library management

System has been written successfully.

Viva Questions

- Q-1 what is the problem statement of Library management system?
The current library system is outdated and inefficient. There is a lack of organization in book management, less registration and system heavily depend on manual process.
- Q-2 what is the main purpose of Library management system?
→ To Manage & track the daily work of the library.
Such as issuing books, return books & calculation of due.
- Q-3 what is the disadvantage of Manual library system?
→ slow to operate
→ difficulty in storing a data efficiently.
- Q-4 who uses Library management system?
It is use for Librarian as well as students.
- Q-5 what is the another name of the Library management system?
Integrated library system.

~~Ans~~
5/1/23

IM

Aim: Requirement analysis and develop Software Requirement Specification sheet (SRS) for library management system.

* SOFTWARE REQUIREMENT SPECIFICATION

1) Introduction

Library Management System is a comprehensive Library Management solution that is suitable for both large and small libraries. Its flexible design enables Library management System to be installed in a range of library organization ranging from Public libraries, through to academic, joint use and special libraries. The Library Management System software is capable of handling books with equal ease and efficiency.

2.1 Purposes

- To provide services to all employees for issue, return, & search etc at one place.
- To improve co-ordination in staff.
- To reduce paper filing work.
- To reduce risk of fraud.
- To reduce chances of information leaking

1.2 scope for members

- a) facility for search for books based on Access Number, Author, Subject or keyword.
- b) facility for issue / Return books.
- c) facility for renewal of books for library staff.
- a) Automatic installation
- b) simple and intuitive GUI for performing all function
- c) short-cut keys and point-and-click operation.
- d) security features like access control using password and login id.
- e) automatic calculation for late-fee.
- f) facility to add / delete members, library staff, Books and maintain easy record of all these.

1.3 Acronyms used

LMS - Library management system

UI → user Interface.

DBMS → Database Management System

The rest of the document deals with all the main features of this software. It not only describes various functions but also gives details how these functions are related to each other. Apart from the data flow diagram, the document also contains cost estimates for developing this system. Various risks associated with the system have also been mentioned along with the ways to mitigate them.

2) Project Description

2.1 Productive Perspective

The manual library management system includes following drawbacks:

- The existing system involves a lot of paper work and manual calculation. This has led to inconsistency and inaccuracy in the maintenance of data.
- The existing system is sluggish and time consuming causing inconvenience to library staff.
- The data, which is stored on the paper can may be lost, stolen or destroyed due to natural calamity like fire and water.

The library management system is proposed with the following product perspective:

- a) It would be easy to specify books.
- b) The machine performs all calculation for fines and all. Hence chances of error are null.
- c) The system provides user ID validation, hence unauthorized access is prevented.

2.1.1 System Interfaces

Software : operating system

Database : MySQL

System : JVM.

2.1.2 System Specification

Software requirement

operating system / we have chosen window operating system for it best support and user friendly.

Database: To save records of the applicants and their details, SQL database is used.

Hardware requirement

LMS uses standard Java classes and database. The database should have backup capabilities.

2.1.4 Memory constraints

The system is expected to have a memory of 256mb and disk space of 500mb. But it is recommended that the system has memory capacity of 1GB and disk space of 1TB.

2.1.5 Operations:

- a) The staff member first has to register him/herself before using the system.
- b) The staff member can then log in to system with his/her username and password.
- c) The staff member can then add, delete or update the book record within the system.
- d) The member can search for a specific book by entering book information.
- e) The staff member can update member record within the system.

2.1.6 Site adaption requirement

The system will require an application for the runtime components and a database for storage. The system will run on select popular application servers and use popular database for data storage.

2.2 Product functions:

These are two different who will be using this product.

- a) Librarian who will be acting as a administrator.
- b) Member who can also use product for search operations.

The features that are available to the librarian are:

- a) A librarian can issue a book to the member.
- b) Can view different categories for books available in library.
- c) Can view the list of books available in each category.
- d) Can take the book returned from students.
- e) Add books and their information of the books to the database.

The features available to the member are:

- a) Can view the different categories of books available in the library.
- b) Can view the list of books available in each category.
- c) Can search for a particular book.

2.3 User characteristics

USER 1: staff - staff will add, delete or update records within the system. He/she will issue the books as per requested by member and will calculate the fine according to returned date of the book.

USER 2: Member → Member will request for book issue and then will return the book. They can search for a specific book.

2.4 General Constraints

Any update regarding the book the library is to be recorded to have update and correct values and any fine on member should be notified as soon as possible and should be calculated correctly.

2.5) Assumption

and Dependencies

Assumptions:

- The coding should be error free
- The system should be user-friendly so that it is easy to use for the users.
- The information cell users, books and libraries must be stored in database.

Dependencies

- On the basis of listing requirement and specification the project will be developed.
- The end users should have proper understanding of the product.

2.6 Apportioning of requirement
This is an academic project and hence all the requirements will be completed before the end of the semester.

3. Specific Requirements.

3.1 External interface

User Interface

Various GUI elements like forms, images, standard buttons will be included in user interface.

3.2 Functional requirement

a) Login

Description: Staff member will be login to the system

Input: username and password

Output: able to use software

processing: checking username and password.

b) Add / Remove Books

Description: Staff can add / remove book.

Input: enter the book you want to add or remove

Output: confirmation of book

processing: the detail of the book must be in right order.

c) Issue book

Description: Before issue check availability of book

Input: enter book code.

Output: confirmation of book.

processing: If available then issue else error.

3.6 d) Return book

a. description: member want to return book.

input: return book to library.

output: The record stored

processing: "if return stored record else fine.

e) Fine:

description: To ^{not} return charged per day as per library rule.

input: check for fines.

output: detail about fines

processing: The fine will be calculated

3.3 performance requirement:

There is no particular extra performance requirement at this point of time.

3.4 logical database requirement:

proposed database is intended to store, retrieve, update and manipulate information related to college which include:

- Book availability
- staff information
- member details.

3.5 Design constraints

Software constraints: The application shall meet the general standards of web application.

Hardware constraints: There is no hardware constraint identified at this moment.

Acceptance constraints:

- a) Demo the working system and any features upon request
- b) Prove that all the significant functional requirement are met.

3.6) Software System attributes

a) Reliability:

The application would efficiently store all the information related to various processes in the system and output the relevant information.

b) Availability:

The Application would be available to all employees of the organization with an authorized access to workstations and those who are subject to the authorization permission.

c) Security:

The system would have adequate security checking through authentication of the users.

d) Maintainability:

The software should not require any additional maintenance. If any error occurs again login with his credential.

Conclusion: System requirement analysis for library management system has been made successfully

Ques. (Question)

Q-1 what is the main purpose of SRS for library management system?

Ans To convey information about the application required both functional & non functional to the reader.

Q-2 what are the main contents in SRS?

- Introduction
- General description
- Functional requirement
- Interface requirement
- Performance requirements

Q-3 what are basics of SRS?

The basic of SRS are the products functional and non functional requirements.

Q-4 what is Requirement management in SRS?

The process of gathering, analyzing, verifying and validating the needs and requirement for the given product or system being developed.

Q-5 what are qualities of good SRS?

- Complete
- Consistent
- Modifiable
- Traceable

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Experiment - 3

Aim: Data flow diagram (DFD) and structured chart for library Management System.

DFD for library Management system

Data flow depicts the flow of information and the transformation applied when a data moves in and out of a system. The overall system is represented and described using input processing and output in the DFD. The inputs can be

- Book Request

When a student requests for a book.

- Library Card

When the student has to show or submit his/her identity as a proof.

The overall processing

output that a system

unit will contain the following

produce or generate:

- Books will be output as the book demanded by the

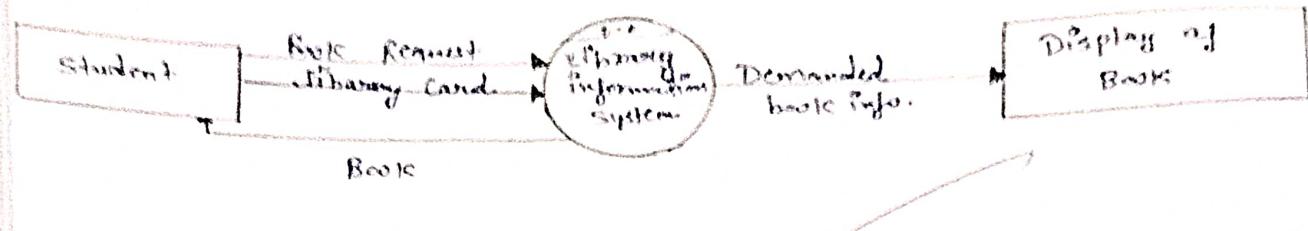
student will be given to them.

- Information be displayed

by the student demanded by the student while selecting the

books which make it easier for the student.

3. Level 0 PFD



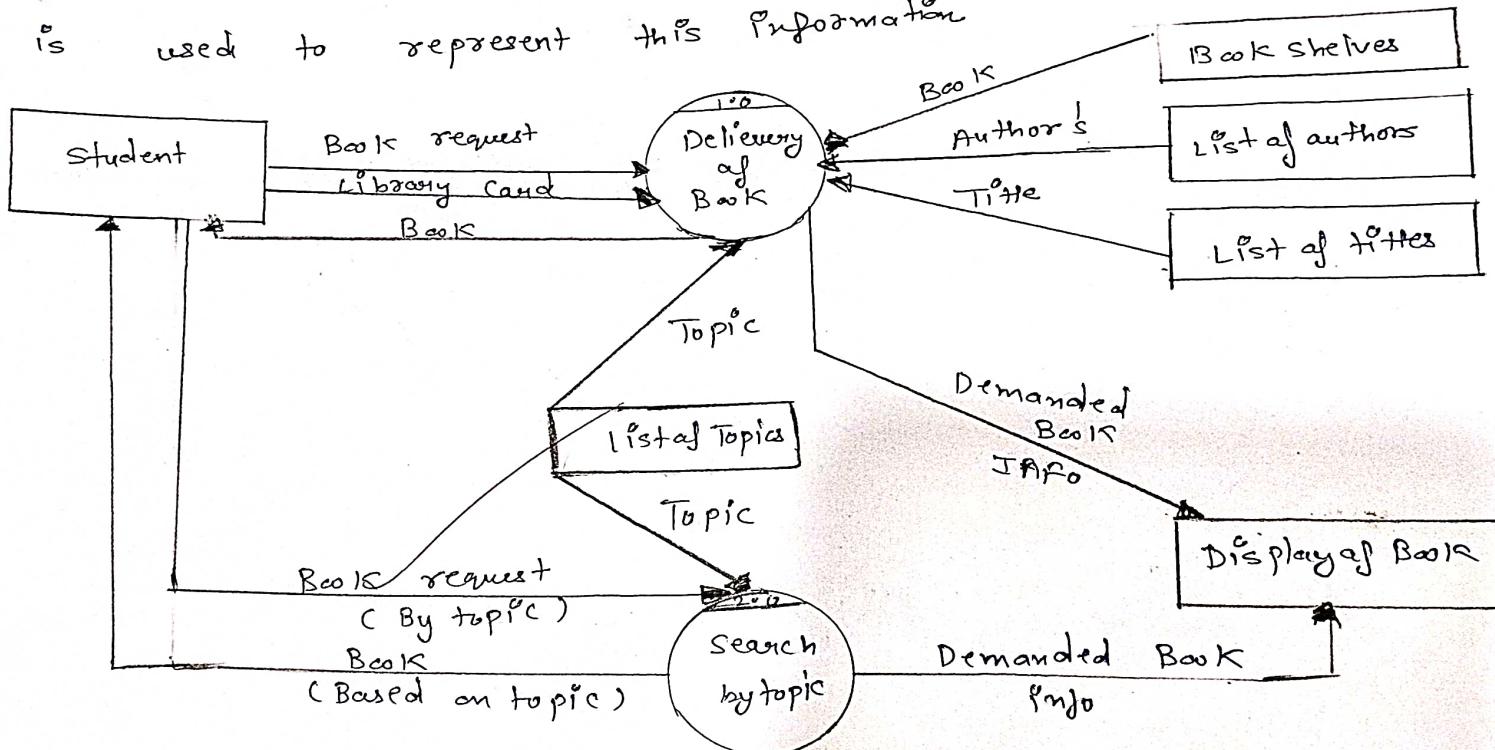
2) Level 1 DFD.

At this level, the system has to show or expose with more details of processing.

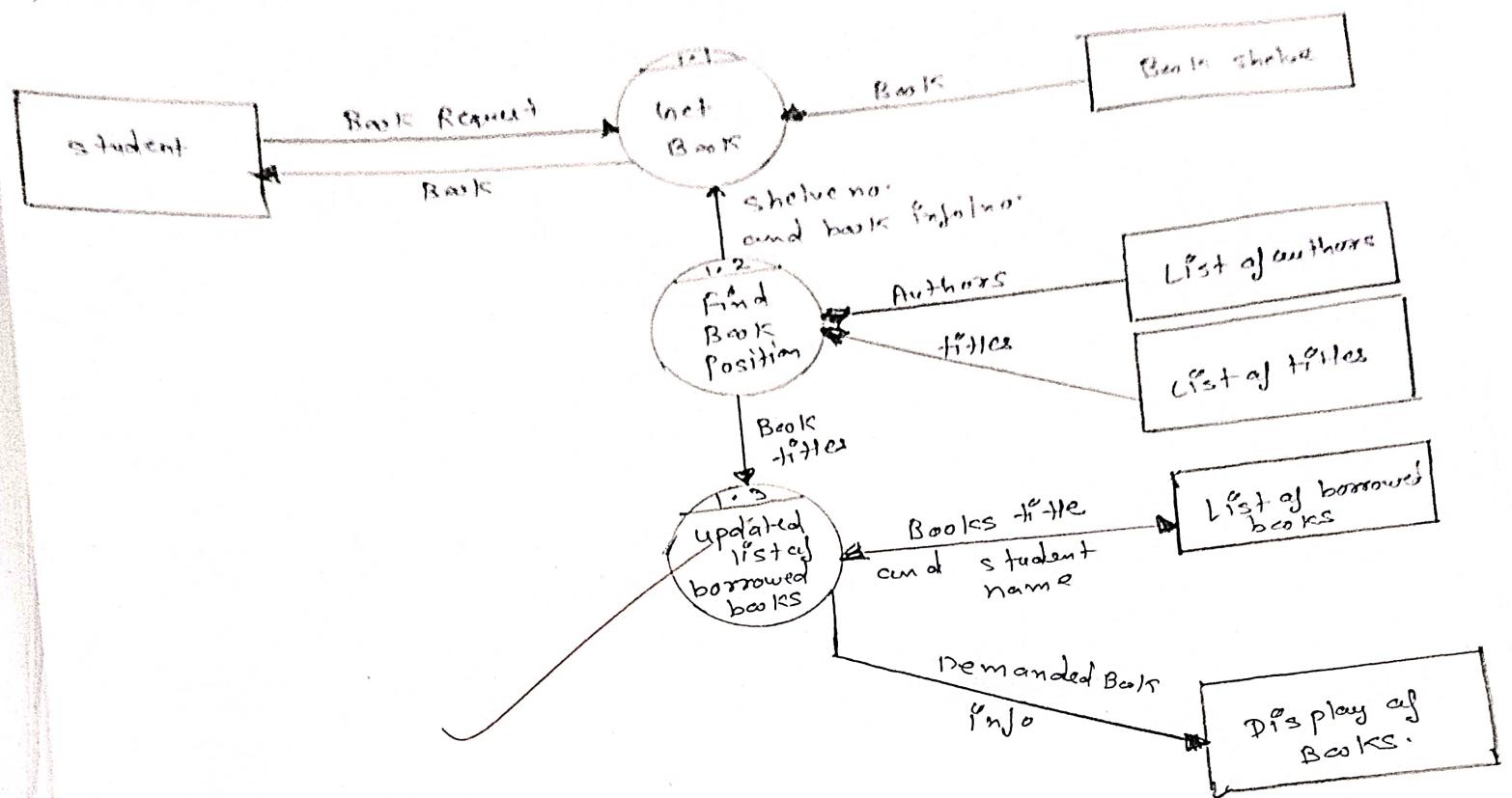
The processes that are important to be carried out are:

- Book delivery
- Search by Topic

List of authors, List of titles, List of topics, the bookshelves from which books can be located are some information that is required for these processes. Data store is used to represent this information.



3) Level 2 DFD



Conclusion: The level 0, Level 1 and Level 2 Data flow diagram for library management system has been drawn successfully.

Viva Questions

Q-1 what is DFD in Library management system?

Ans It depicts the flow of information and the transformation applied when a data move in and out from a system.

Q-2 what is basic rule of DFD?

Ans Each process should have at least input and an output.

Q-3 what are types of DFD?

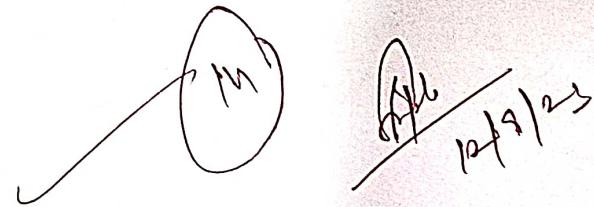
Two distinct types of DFD

1) Logical DFD.

2) physical

Q-4 what are 4 components of DFD?

- entity
- process
- Datastore
- Data flow



Q-5 Give Two advantages of DFD?

- understanding the functioning
- The understanding the limits of a system

Experiment - 4

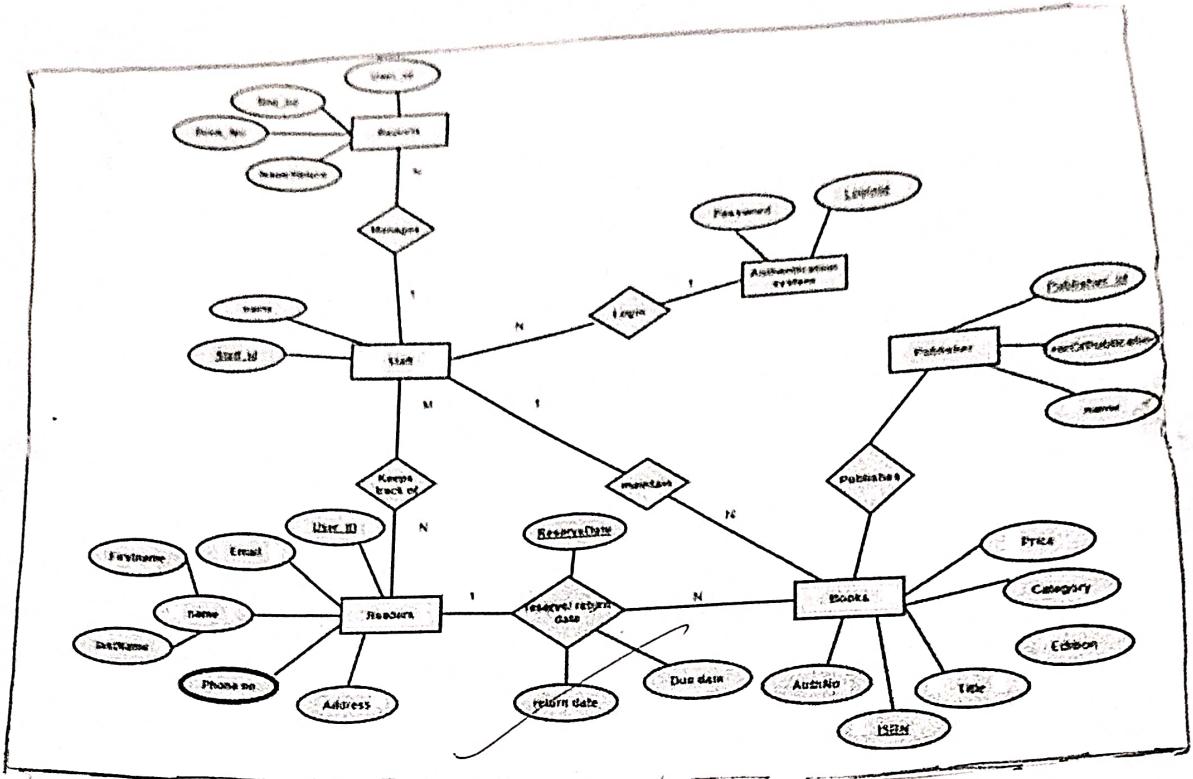
Aim: Draw the entity relationships for the library management system.

ER diagram is known as Entity Relationship Diagram, it is used to analyze the structure of the database. It shows relationships between entities and their attributes. An ER model provides a mean of communication.

- The Library Management System keeps the track of readers with the following consideration.
- The system keep tracks of the staff comprising login id and password.
 - Staff maintains the book catalog with ISBN, Book title, price (in INR), category (novel, general, story), edition, author number and details.
 - A publisher has publisher id, year when the book was published and name of the book.
 - Readers are registered with their user-id, email, name, phone no, communication address. The staff keep track of readers.
 - Readers can return reserve books that stamps with the issue date and return date. If not returned within the prescribed time period, it may be have due date too.
 - Staff also generate reports that has readers id, no. of reports, book no. and return info.

- * entities and attributes
- Book entity: It has attributes, book no., title, edition, category, price, ISBN. ISBN is the primary key for Book entity.
- Reader entity: It has user-id, email, address, phone-no., Name is composite attribute of first name and last name. Phone no. is multi-valued attribute. User-id is the primary key for Reader entity.
- Publisher Entity: It has publisher ID, year of publication, name, publisher ID is the primary key.
- Authentication system entity: It has login-id and password with Login-ID as primary key.
- Report entity: It has serial, reg-no, book-no, issue/return date. Reg-no is the primary key of report entity.
- Staff entity: It has name and staff-id with staff-id as primary key.

Conclusion: The entity relationship diagram for Library management system has been successfully drawn.



Entity relationship diagram for Library management system.

Conclusion: Entity relationship diagram for Library management system has been drawn successfully.

entity
relationship
attribute
value
constraint

- Q-1 What is ER model of Library management system?
 Ans ER diagram is a entity relationship diagram, it is used to analyze the structure of database.
- Q-2 what are 3 components of ER?
 • entities
 • attributes
 • relationships
- Q-3 what is attribute in ER diagram?
 → It is characteristics of the entity that help users to better understand the database.
- Q-4 what is one to many relationship in ER diagrams?
 It is the type of cardinality that refer to a relationship b/w two entities in an entity relational diagram.
- Q-5 How do we reduce the ER diagram to schemas?
 Ans Identify the primary key, attribute that will become differentiating column in relation.

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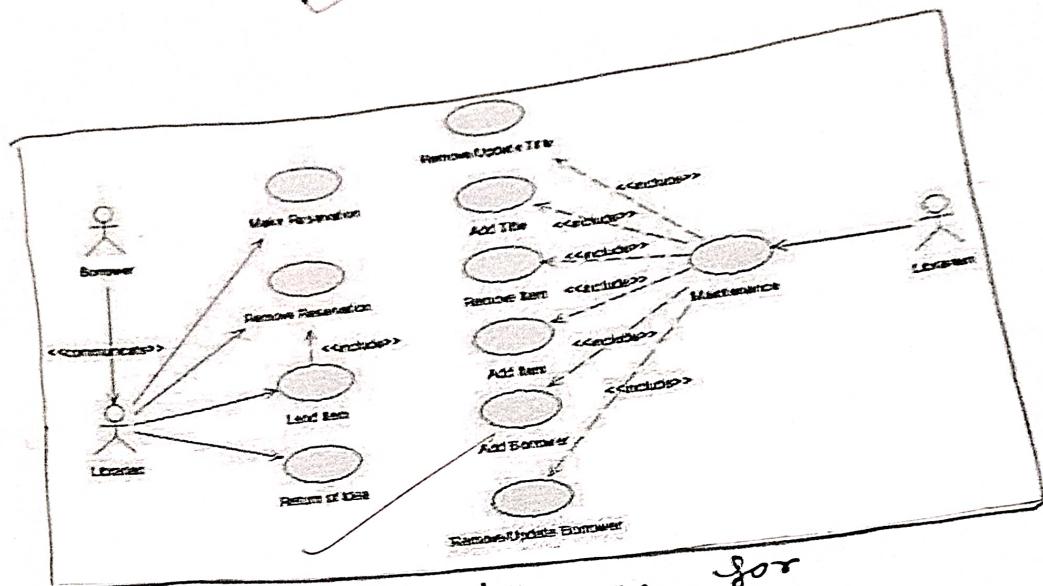
Plans to perform the user analysis for the system : use case diagram.

use case diagram referred as behaviour model or diagram of simply describes and displays the relation or interaction between the users or customers and provides of application service or the system. It describes different action that a system performs in collaboration to achieve something with one or more users of the system.

Designing of use case diagram

- 1) user who registers himself as a new user initially is regarded as staff or student for the library system.
- 2) after getting the library card, a new book is requested by the user as per requirement.
- 3) After requesting, the desired book or the requested book is reserved by the user that means no other user can request for that book.
- 4) Now, the user can renew a book that means the user can get a new due date for the desired book if the user has renewed them.
- 5) If the user somehow forget the due date then the user pay fine to return the book before the due date.
- 6) User can fill the feedback from available if they want to.

- ✓
- 1) Librarian has a key role in this system. Librarian
the records in the library database about each student's
or user every time issuing the book or paying.
2) updating database is the important role of librarian.



use case diagram for
library management system

Conclusion: Use case description of Library management Sys
has been written successfully

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26/9/23

Experiment 6

UML Use Case

- Q-1 what is the main use of use case diagram?
- Q-2 It describes the high level function and scope of a system.
- Q-3 what are the three components of use case diagram?
- Use cases
 - Actors
 - Association
- Q-4 what are examples of use case?
- e.g.: A system use case might be "return book when overdue".
- Q-5 who are the actors in a use case diagram?
- As users of the system are depicted as actors.
- Q-6 what are components of use case?
- actors
 - system itself
 - relationships
 - use cases.

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