BOOK BANK MANAGEMENT SYSTEM

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Describe how things should work.

Book banks lend books for a period of time and require a deposit and a membership. All the details of available books are shown. Users have to register by filling up a few personal details and will have a unique ID and a password for accessing the profile. The user can select a limited number of books that he/she wants. The user can reserve books if it is not available so that he/she can get the book once it is returned by some other user. Returning of books will be updated in the user's profile accordingly. Fine has to be paid for books that have been passed the due date. The admin gets to remove users and check the status of books and users. Additionally, the admin can purchase books that qualify certain norms from the vendor in bulk.

Explain the problem and state why it matters.

Management of the large quantity of books present in a book bank is difficult.
Keeping track of the books borrowed and the penalty for the students who borrowed it for too long is a tedious job for a librarian armed only with a ledger. The librarian has little to no idea about the different prices for the same book by different vendors and hence is unable to make a proper deal.
It is difficult for the admins to find out the financial turnover of the book bank. This is very important as it decides if the bank is making any profit.

Explain your problem's financial costs.

To make a software complete with a front end UI, back end and storage it would easily amount upto 20-30k for the work involved by SSN students. If the program is hosted on an online platform it would require a fee of 150/mo for DNS and a 24/7 server system at the book bank.

The server system has to be powerful to be able handle many incoming connections simultaneously and thus is expensive (about 90k -3lacs).

Back up your claims.

Investing on a software is a one-time investment. It would help the management to easily monitor the book bank activities. This in turn reduces the number of people required to manage a book bank and thus reducing maintenance costs. The cost to maintain a book bank software is negligible compared to having more human resources to manage it.

Propose a solution.

A software is required for the easy management of the large quantity of books present in a book bank. It helps the management to keep track of the books borrowed and the penalty for the students who borrowed it for too long. It also helps the management to find required books and negotiate with the vendor to buy the books.
All of these measures can help the admins to find the profit or loss made by the book bank.

Explain the benefits of your proposed solution(s).

- The portal will keep a track of all the previous users who've used the book.
- It can also find where the book is, if the book is missing by checking the previous user and the return status.
- The users can get notified about the due date on which the book has to be returned.
- Ease in managing the book bank.
- Reservation of books by the user is possible.

Conclude by summarizing the problem and solution.

As it is evident to see that it is much more tedious to manage a book bank equipped only with a ledger and not very economical, it is advisable to use a book bank management system to manage in an efficient way.

Software Requirement Specification

1. Introduction

Book banks lend books for a period of time and require a deposit and a membership. All the details of available books are shown. Users have to register by filling up a few personal details and will have a unique ID and a password for accessing the profile. The user can select a limited number of books that he/she wants. The user can reserve books if it is not available so that he/she can get the book once it is returned by some other user. Returning of books will be updated in the user's profile accordingly. Fine has to be paid for books that have been passed the due date. The admin gets to remove users and check the status of books and users. Additionally, the admin can purchase books that qualify certain norms from the vendor in bulk.

Purpose

The purpose of Software Requirements Specification (SRS**)** document is to describe the external behavior of the Book Bank. Requirements Specification defines and describes the operations, interfaces, performance, and quality assurance requirements of the Book Bank. The document also describes the nonfunctional requirements such as the user interfaces. It also describes the design constraints that are to be considered when the system is to be designed, and other factors necessary to provide a complete and comprehensive description of the requirements for the software. The Software Requirements Specification captures the complete software requirements for the system, or a portion of the system.

Scope

The Software Requirements Specification captures all the requirements in a single document. The Book Bank that is to be developed provides the admin and members of the Book Bank with books information, online blocking of books and many other facilities. The Book Bank is supposed to have the following features.

- The product provides the members with online blocking of books.
- The system provides a login facility to the users.
- The system provides the members with the option to check their account and/or change their options like password of the account whenever needed all through the day during the library hours.

- The system allows the members to block the books 24 hours a day and all through the semester.
- The system lets the library staff to check which all members have blocked the books and whether they can borrow any more books .
- The system allows the admin to create the books catalog, add/delete books and maintain the books catalog.
- The system updates the billing system as and when the member borrows or returns a book.
- ·We also have an order department, which manages to add or remove a book from the Library.

The features that are described in this document are used in the future phases of the software development cycle. The features described here meet the needs of all the users. The success criteria for the system is based on the level up to which the features described in this document are implemented in the system.

Overview

The SRS will provide a detailed description of the Book Bank. This document will provide the outline of the requirements, overview of the characteristics and constraints of the system.

Section 2: This section of the SRS will provide the general factors that affect the product and its requirements. It provides the background for those requirements. The items such as product perspective, product function, user characteristics, constraints, assumptions and dependencies and requirements subsets are described in this section.

Section 3: This section of SRS contains all the software requirements mentioned in section 2 in detail sufficient enough to enable designers to design the system to satisfy the requirements and testers to test if the system satisfies those requirements.

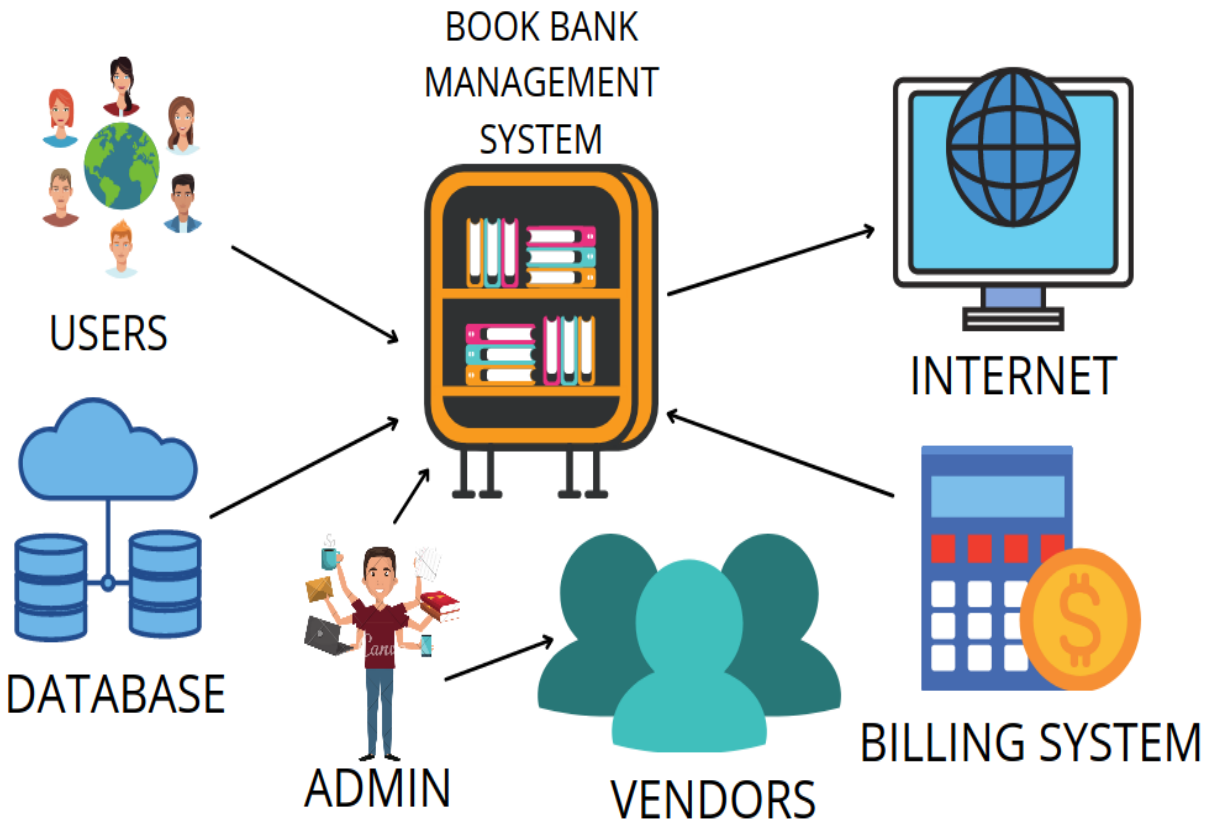
2. Overall Description

● Product perspective

Book bank management systems are designed to manage lending of books in an efficient way. The system provides a list of books from which the user can lend a limited number of books and the admins can keep track of each and every process that the user is involved in.

The product has to interact with other systems like: admins, vendors, users, billing system, internet, database.

The complete overview of the system is as shown in the overview diagram below:



- **Product Functions**

The book bank management system provides information about the books in the book bank. The functions of this system includes the different types of services based on the type of users.

- The members/users of the system should be provided access to the books available in the system.
- If a specific book that the user wants is not available, he/she can reserve the book and can get it once it is made available.

- Every book should be returned within a particular period of time or fine shall be imposed.
- The admin should be provided information about all the books in the book bank and the users.
- The admin should be able to remove a user from the system and also to check the status of the user.
- Admin has to buy books from the vendors and can update the book catalog of the system accordingly.
- Admin can also remove the books from the catalog.
- All the transactions like the membership payment and the due payment will be available in the billing system.

● User characteristics

The users of the system are members and administrators who maintain the system. The members and the admins are assumed to have basic knowledge of the computers and internet browsing. The administrators of the system should have more knowledge of the internals of the system. All the users such as the members and the admins should know the structure and working of the Book Bank management system. The proper user interface, users manual, online help and the guide to install and maintain the system must be sufficient to educate the users on how to use the system without any problems.

● Constraints

- The information of all the users must be stored in a database that is accessible by the Book Bank Management System.
- The Book Bank Management System must be compatible with the Internet applications.
- The users access the Book Bank Management System from any computer that has Internet browsing capabilities and an Internet connection.
- The billing system is connected to the Book Bank Management System and the database used by the billing system must be compatible with the interface of the System as well.
- The users must have their correct usernames and passwords to enter into the Online Library System.

- **Assumptions and dependencies**

    - The users have sufficient knowledge of computers.
    - The users know the English language, as the user interface will be provided in English.
    - The database should be accessible by the system to access the relevant information.

3. Specific Requirements

3.1 **Functionality**

3.1.1 Logon Capabilities

The system shall provide the users with login capabilities.

3.1.2 Mobile Devices

The Online Book Bank is also supported on mobile devices such as cell phones.

3.1.3 Alerts

The system can alert the administrator in case of any problems.

3.2 **Usability**

3.2.1 The system shall allow the users to access the system from the Internet using HTML or it's derivative technologies. The system uses a web browser as an interface.

3.2.2 Since all users are familiar with the general usage of browsers, no specific training is required.

3.2.3 The system is user friendly and self-explanatory.

3.3 **Reliability**

The system has to be very reliable due to the importance of data and the damages incorrect or incomplete data can do.

3.3.1 Availability

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.

3.3.2 Mean Time Between Failures (MTBF)

The system will be developed in such a way that it may fail upto 3 times in a year.

3.3.3 Mean Time to Repair (MTTR)

Even if the system fails, the system will be recovered back up within an hour or less.

3.3.4 Accuracy

The accuracy of the system is limited by the accuracy of the speed at which the employees of the book bank and users of the book bank use the system.

3.3.5 Maximum Bugs or Defect Rate

Once every month.

3.3.6 Access Reliability

The system shall provide 100% access reliability.

3.4 **Performance**

3.4.1 Response Time

The index.html page should be able to be downloaded within a minute using a 56K modem. The information is refreshed every two minutes. The access time for a mobile device should be less than a minute. The system shall respond to the member in not less than two seconds from the time of the request submittal. The system shall be allowed to take more time when doing large processing jobs.

3.4.2 Administrator Response

The system shall take as less time as possible to provide service to the administrator or the librarian.

3.4.3 Throughput

The number of transactions is directly dependent on the number of users, the users may be the admin or even the people who use the Book bank for checking-out books, returning books and checking online Book bank accounts.

3.4.4 Capacity

The system is capable of handling 250 users at a time.

3.4.5 Resource Utilization

The resources are modified according to the user requirements and also according to the books requested by the users.

3.5 **Supportability**

The system designers shall take into considerations the following supportability and technical limitations.

3.5.1 Internet Protocols

The system shall comply with the TCP/IP protocol standards and shall be designed accordingly.

3.5.2 Information Security Requirement

The system shall support the UHCL information security requirements and use the same standard as the UHCL information security requirements.

3.5.3 Billing System Data Compatibility

The member balance amount that will be calculated and sent to the billing system shall be compatible with the data types and design constraints of the billing system.

3.5.4 Maintenance

The maintenance of the system shall be done as per the maintenance contract.

3.5.5 Standards

The coding standards and naming conventions will be as per the American standards.

3.6 **Design Constraints**

3.6.1 Software Language Used

The languages that shall be used for coding the Online Book bank System PHP,Java Servlets, Python Server Pages (PSP), HTML,CSS, JavaScript, and VBScript. For working on the coding phase of the Online Book bank System, the Apache Server needs to be installed.

3.6.2 Development Tools

Will make use of the available Java Development Tool kits for working with JavaBeans and Java Server Pages. Also will make use of the online references available for developing programs in PHP, Python, HTML and the two scripting languages, JavaScript and VBScript.

3.6.3 Class Libraries

Will make use of the existing Python libraries available for PSP. Also we need to develop some new libraries for the web-based application.

3.7 **On-line User Documentation and Help System Requirements**

Online help is provided for each of the features available with the Online Book bank System. All the applications provide an on-line help system to assist the user. The nature of these systems is unique to application development as they combine aspects of programming (hyperlinks, etc) with aspects of technical writing (organization, presentation). Online help is provided for each and every feature provided by the system. The User Manual describes the use of the system to administrators and Employees.

Also, a Read Me file is typically included as a standard component. Most users also appreciate documentation defining any known bugs and workarounds in the Read Me file. An installation Guide will not be provided to the user.

3.8 **Purchased Components**

The system need not purchase any licensing products.Nevertheless, a domain name to host the server must be purchased.

3.9 **Interfaces**

3.9.1 User Interfaces

Will make use of the existing Web Browsers such as Microsoft Internet Explorer or Netscape. The user interface of the system shall be designed as shown in the user-interface prototypes.

3.9.2 Hardware Interfaces

The existing Local Area Network (LAN) will be used for collecting data from the users and also for updating the Book bank Catalogue.

3.9.3 Software Interfaces

A firewall will be used with the server to prevent unauthorized access to the system.

3.9.4 Communications Interfaces

The Online Book bank System will be connected to the World Wide Web.

3.10 **Licensing Requirements**

The usage is restricted to only Shiv Nadar University Book bank who is purchasing the Online Book bank System from Book bank Pros and signs the maintenance contract.

3.11 **Legal, Copyright, and Other Notices**

Online Book bank System is a trademark of Book bank Pros and cannot be used without its consent.

3.12 **Applicable Standards**

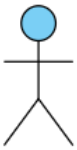
The ISO/IEC 6592 guidelines for the documentation of computer based application systems will be followed.

USE CASE DIAGRAM

Aim:

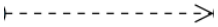
Creation of an UML Use case model for a book bank.

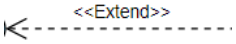
Notations:

 - Actor

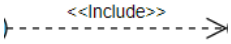
- Use case

 - Association

 - Dependency

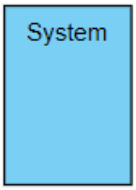


- Extend (dependency)



- Include (dependency)

 - Generalization



- System/Sub-system

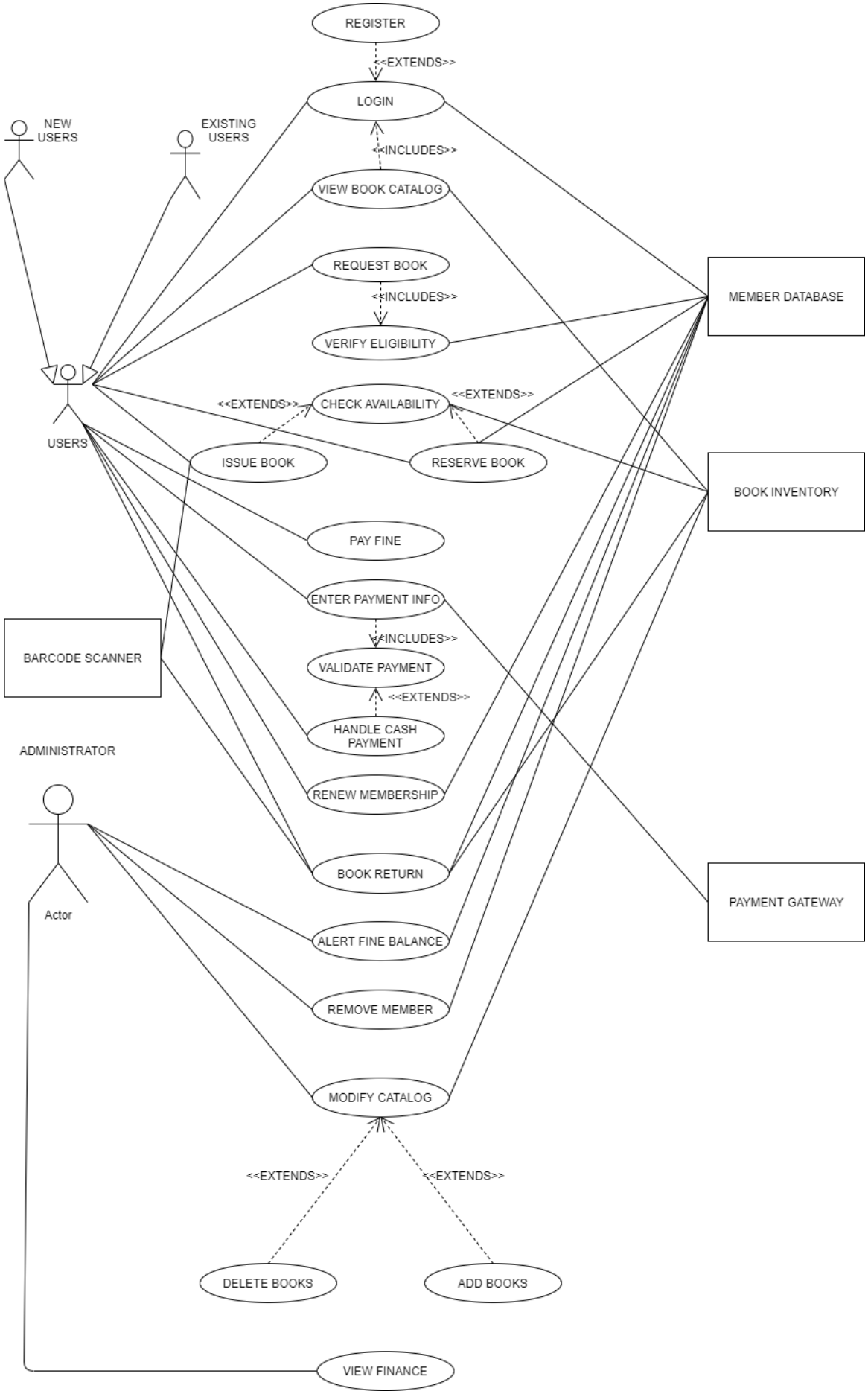
Identification of Actors

1. Existing user
2. New user
3. Administrator
4. Member Database
5. Book Inventory
6. Payment Gateway
7. Barcode scanner

Identification of Scenarios

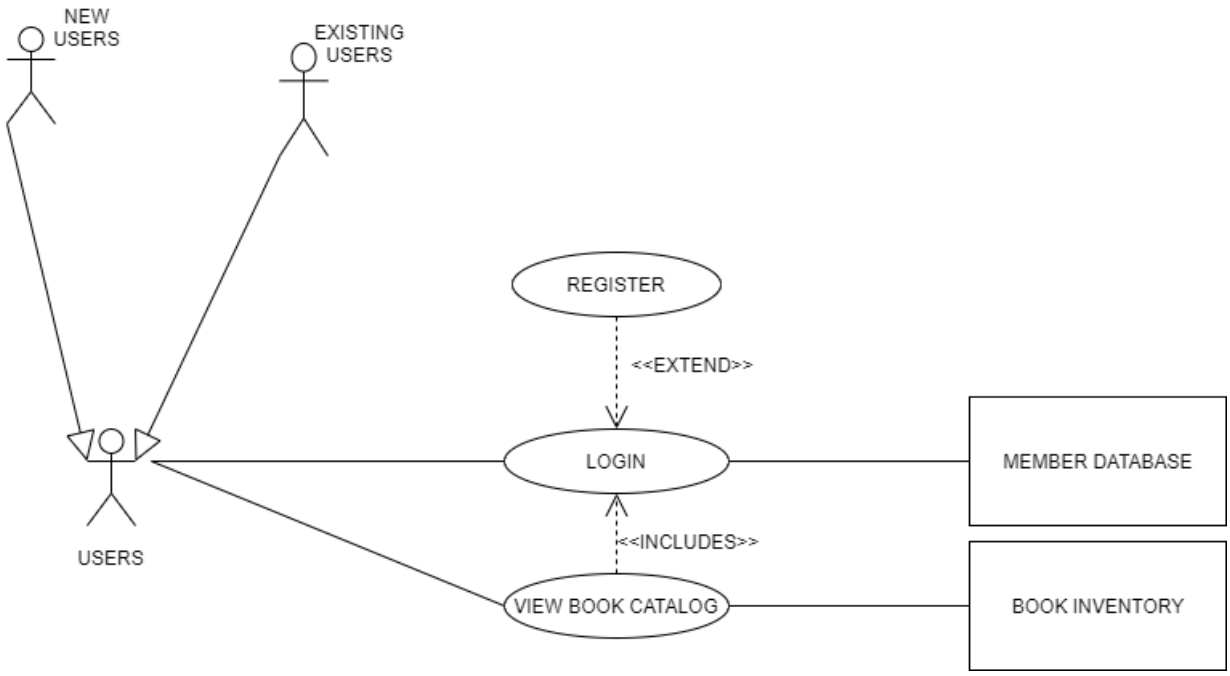
I. User will either login (if existing user) or will sign up (if new user)
II. View Book catalog
III. User requests the required book or books
    A. System verifies user eligibility based on history of user fines
IV. Check availability for issuing book
    A. Reserve Book if unavailable at the moment
V. Issue book and update book inventory
VI. View and pay fine, if penalty found
VII. Enter payment information
    A. Validate Payment
    B. Handle Cash Payment
VIII. Renew membership by user
IX. Return Book and update inventory
X. Alert Fine Balance to administrator or user
XI. Remove member
XII. Modify catalog
    A. Delete books
    B. Add books

Draw Use Case diagrams for all the scenarios and subfunction identified above

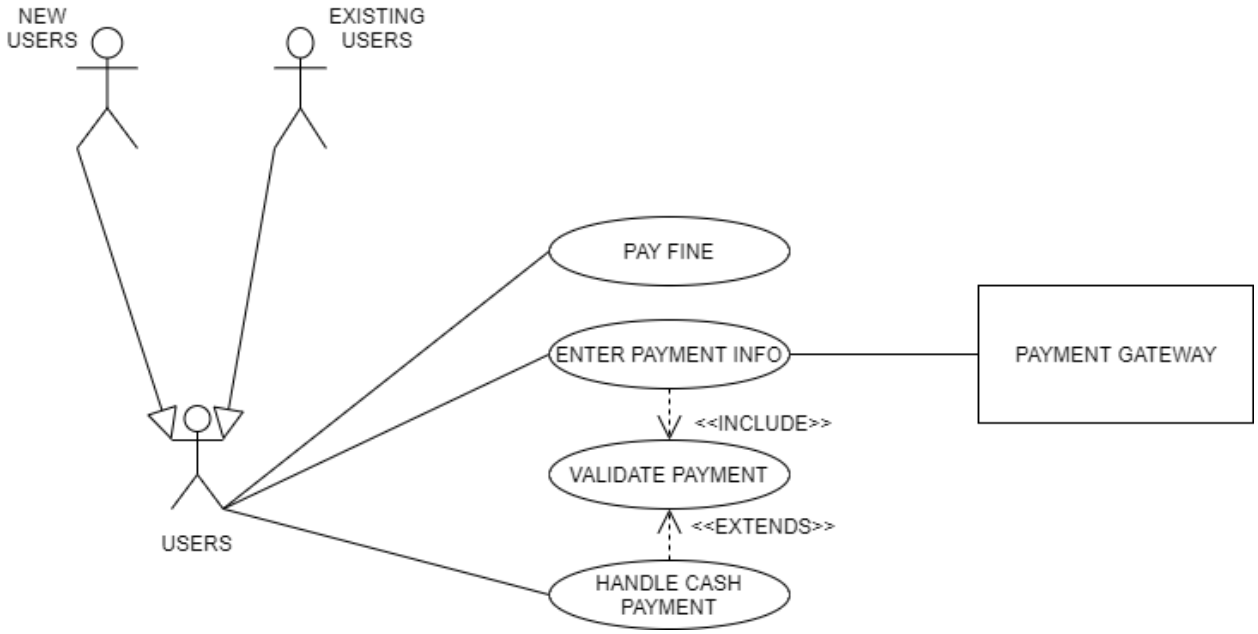

REGISTER
<<EXTENDS>>
LOGIN
NEW USERS
EXISTING USERS
<<INCLUDES>>
VIEW BOOK CATALOG
REQUEST BOOK
<<INCLUDES>>
VERIFY ELIGIBILITY
MEMBER DATABASE
USERS
<<EXTENDS>>
CHECK AVAILABILITY
<<EXTENDS>>
ISSUE BOOK
RESERVE BOOK
BOOK INVENTORY
PAY FINE
ENTER PAYMENT INFO
BARCODE SCANNER
<<INCLUDES>>
VALIDATE PAYMENT
<<EXTENDS>>
HANDLE CASH PAYMENT
ADMINISTRATOR
RENEW MEMBERSHIP
BOOK RETURN
PAYMENT GATEWAY
Actor
ALERT FINE BALANCE
REMOVE MEMBER
MODIFY CATALOG
<<EXTENDS>>
<<EXTENDS>>
DELETE BOOKS
ADD BOOKS
VIEW FINANCE

Subfunction use case:

1. User registration

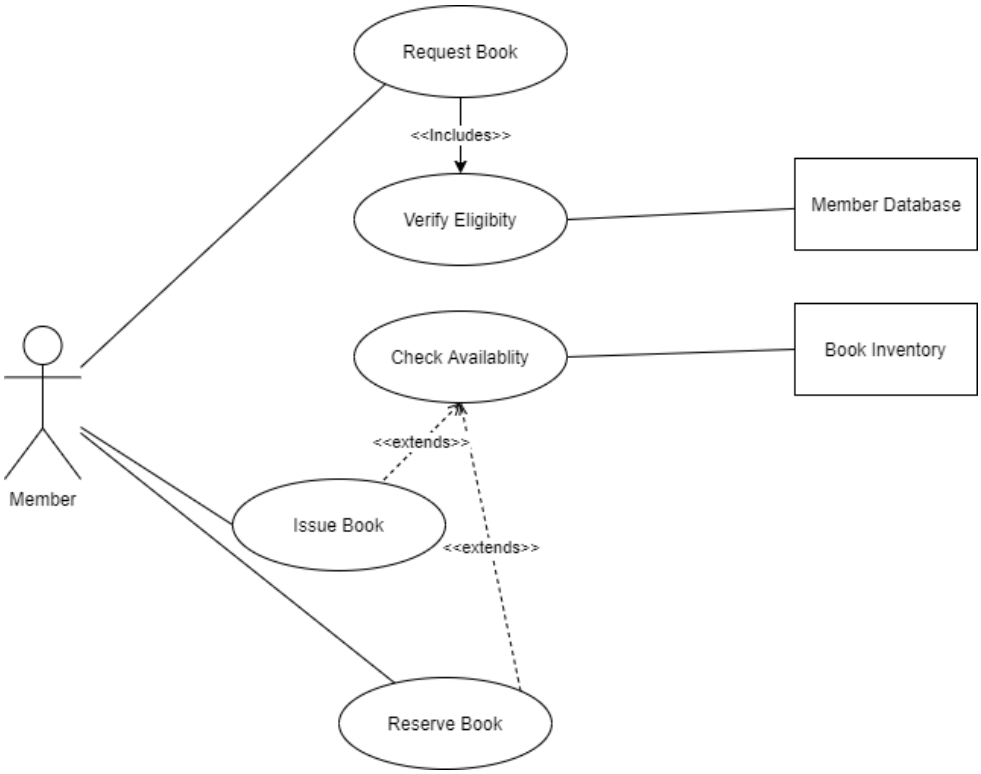


2. Payment

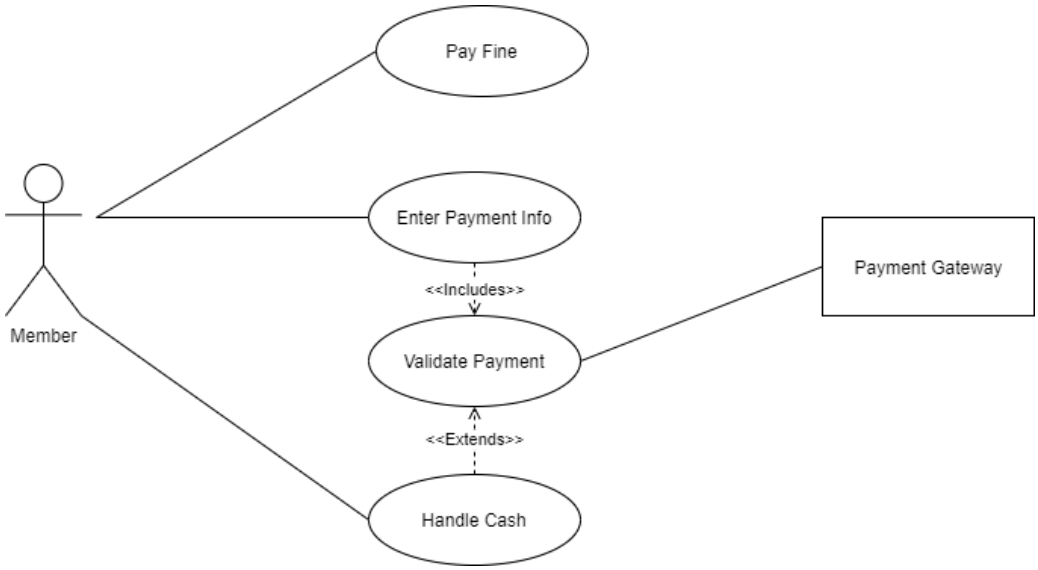


Alternate Scenarios:

1. **Book not available**



2. **Member can only pay by cash**



Scope: Book Bank
Level: User goal
Primary Actor: Admin
Stakeholders and Interests:
· Member: Wants to make an easy and hassle free purchase from the book bank. Wants proof of purchase to for return purpose
· Admin: Wants to keep an accurate track of the books, handles all the issues of the member and make sure the payment is verified

A) Main Success Scenario:
1. Member arrives at the book bank.
2. Member requests or returns a book.
3. Administrator checks the eligibility of the member.
4. After verifying the member, the administrator checks the availability of the book / takes the returned book.
5. If the book is available the administrator issues the book / checks if the returned book has any fines.
6. The member pays for the issued book / pays the fine for the returned book.
7. If the payment is made by a cashless transaction the administrator validates the payment method.
8. After the payment is validated the administrator handovers the book to the member.
9. The member leaves with the book.

B) Alternate scenarios:
1. New member registration:
    a. Admin identifies the member has a new member
    b. Member requests to register in the book bank
    c. Admin feeds the details of the member into the system
    d. The member pays the required amount.
    e. The admin verifies the payment.
    f. The member is now registered in the book bank
2. Admin wants to removes an existing member:
    a. Admin searches the system for a particular member
    b. If the member details are found , the admin removes the member details from the system.
    c. The member details is successfully deleted
3. Requested book is not available:
    a. Member requests for a book

b. Admin checks if the book is available
c. If the book has been taken by another member
    i. The admin checks the due date and informs the member to come back on that date.
d. If the book is not available in the book bank
    i. The admin makes note of the book.
    ii. The admin places an order for the book.
e. The admin informs the member about the status accordingly

4. Fine Payment:
    a. The member returns a book.
    b. The admin finds that there is a fine amount to be paid due to the delay in returning the book
        i. The admin checks the system for the amount to be paid
    c. The member pays the fine amount
        i. The member pays by cash
            - The amount is received by the admin.
        ii. The member pays by cashless mode
            - The payment method is verified by the admin
            - If the payment method is not verified the admin rejects the payment, the member is asked to try a different mode of payment.
            - Once verified the fine amount is paid.
    d. The admin clears the fine due after the payment is received
5. Fine alert:
    a. The admin receives an alert for fine payment.
    b. The admin checks the system for the member with the concerned fine payment alert.
    c. The admin then notifies the member about the fine due and the book to be returned.
6. New book issue:
    a. The member asks for a book to be issued.
    b. The admin checks the book availability
    c. Then the admin scans the barcode of the book and issues it to the member.
7. Member login:
    a. The member requests to see the history of transactions
    b. The admin checks the member login ID
        i. If the login is valid
            - The member is shown the past transactions of the books borrowed , returned , pending and the fines paid.
        ii. If the login is invalid
            - The member is asked to register

c. The member leaves after receiving the required information

8. Book addition and deletion:
    a. The admin views the catalog of all the books available
    b. The admin wants to buy a book:
        i. The admin decides the book to be bought
        ii. The admin paces the order for the book
        iii. The book details is uploaded in the system
    c. The admin wants to delete a book:
        i. The admin selects the book to be deleted
        ii. The details of the book is removed from the system
9. Renewal of membership:
    a. The member wants to renew the book bank membership.
    b. The admin verifies the details of the member.
    c. The member pays the amount required.
    d. The payment is verified by the admin
    e. Membership renewal is completed
10. Finance
    a. The admin checks the fine amount details
    b. The fine amount paid till date is displayed by the system
    c. The pending payments are also displayed with the member information accordingly.

C) One important sub function:

Payment Verification:

1) Cash payment:
    a) If the payment is made by cash it is verified by the admin
    b) Once it is verified by the admin then payment is confirmed
2) Cashless payment:
    a) If the payment is made by credit/debit card
    b) The admin verifies the card using the system
    c) If the card is accepted then the payment is confirmed
    d) If not the payment method is declined by the admin

Documentation

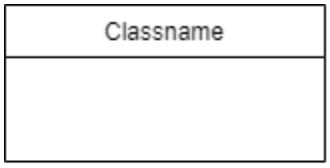
The use case diagram depicts all the actors involved in the system , the specific scenarios such as lost books are also handled and the specific diagrams are represented . The entire functioning of a book bank is depicted with the member and admin as the main actors.
Member arrives at the book bank. Member requests or returns a book.Administrator checks the eligibility of the member. After verifying the member, the administrator checks the availability of the book / takes the returned book. If the book is available the administrator issues the book / checks if the returned book has any fines. The member pays for the issued book / pays the fine for the returned book. If the payment is made by a cashless transaction the administrator validates the payment method. After the payment is validated the administrator handovers the book to the member. The member leaves with the book.

DOMAIN MODEL AND CLASS DIAGRAM

AIM

To design a domain model and class diagram for book bank management systems.

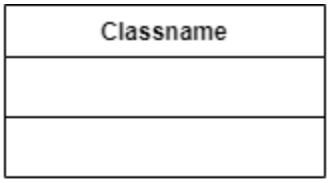
UML Notations for Domain model diagram



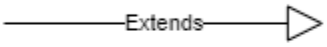
Domain model

Object Association

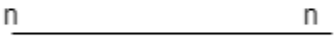
UML Notations for Class diagram



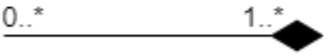
Class



Class Generalization Relationship



Object Association



Object Composition Association

Object Aggregation Association

Identification of Classes

a. Conceptual Class Category List

Conceptual class category	Examples
Physical or tangible objects	books,register
specifications , designs or description of things	Books description
transactions	Payment gateway
Roles of people	Member,Non-member, Admin
Containers of other things	Book Inventory
Things in a container	Books
Other computer or electro mechanical systems external to the system	PaymentValidationSystem
Abstract noun concepts	User
events	Order, return, pay, reserve, login, register
processes	ViewCatalog, OrderABook, ReturnABook, ReserveABook, checkDue, VerifyMemberEligibility, CheckBookAvailability, AlertFineBalance, RemoveMembers, ModifyBookCatalog, ViewFinance,HandleCash
Rules and policies	RenewMembership
catalogs	BooksCatalog
Records of finance,work,contracts,legal matters	PaymentDetails, BooksTransaction, MemberDetails, FinancialTurnover
Financial instruments and services	BookStock

b. Identification of Noun Phrases

- Login
- Register
- Books
- User
- Admin
- Payment
- Validate Payment
- Cash Payment
- Alert Fine
- Finance

Identification of Associations

a. Association Category list

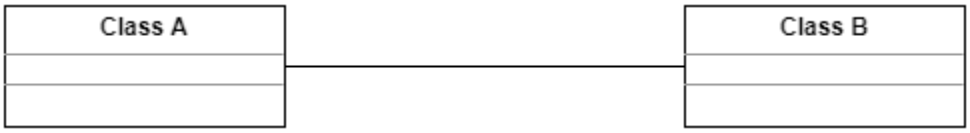
Category	Example
A is logically contained in B	BookDescription-BookCatalog User-BookBankManagment Admin-BookBankManagment
A is a description for B	BookDescription-Book
A is known/logged/recorded in B	Payment-PaymentDetails BookTransaction-MemberDatabase
A is a member of B	Admin-BookBankSystem
A uses or manages B	Admin-BookCatalog Admin-MemberDatabase Admin-ViewFinance User-Login User-Register User-Order User-Reserve User-Return User-Pay
A communicates with B	User-BookBankSystem Admin-BookBankSystem

A is related to a transaction B	User-FinePayment User-Renewal RequestBook-VerifyEligibility Payment-ValidatePayment
A is a transaction related to another transaction B	Order-Return CheckAvailability-Issue CheckAvailability-Reserve CheckFine-AlertFineBalance

b. Definition of Associations and their notations (Generalization, Aggregation and Composition)

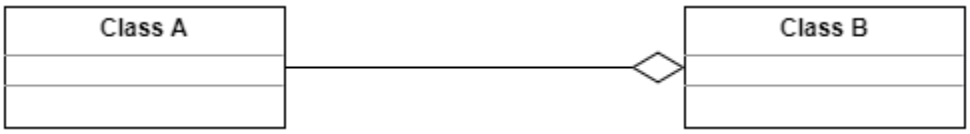
- **Association**

  Association relationship is a structural relationship in which different objects are linked within the system. It exhibits a binary relationship between the objects representing an activity



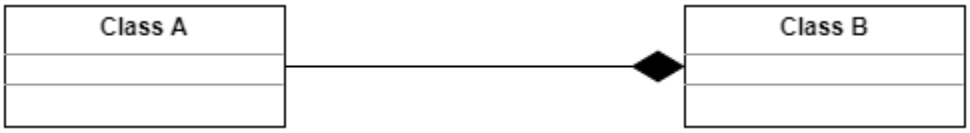
- **Aggregation**

  Aggregation is a subset of association, is a collection of different things. It represents a relationship. It is more specific than an association. It describes a part-whole or part-of relationship. It is a binary association, i.e., it only involves two classes. It is a kind of relationship in which the child is independent of its parent.



- **Composition**

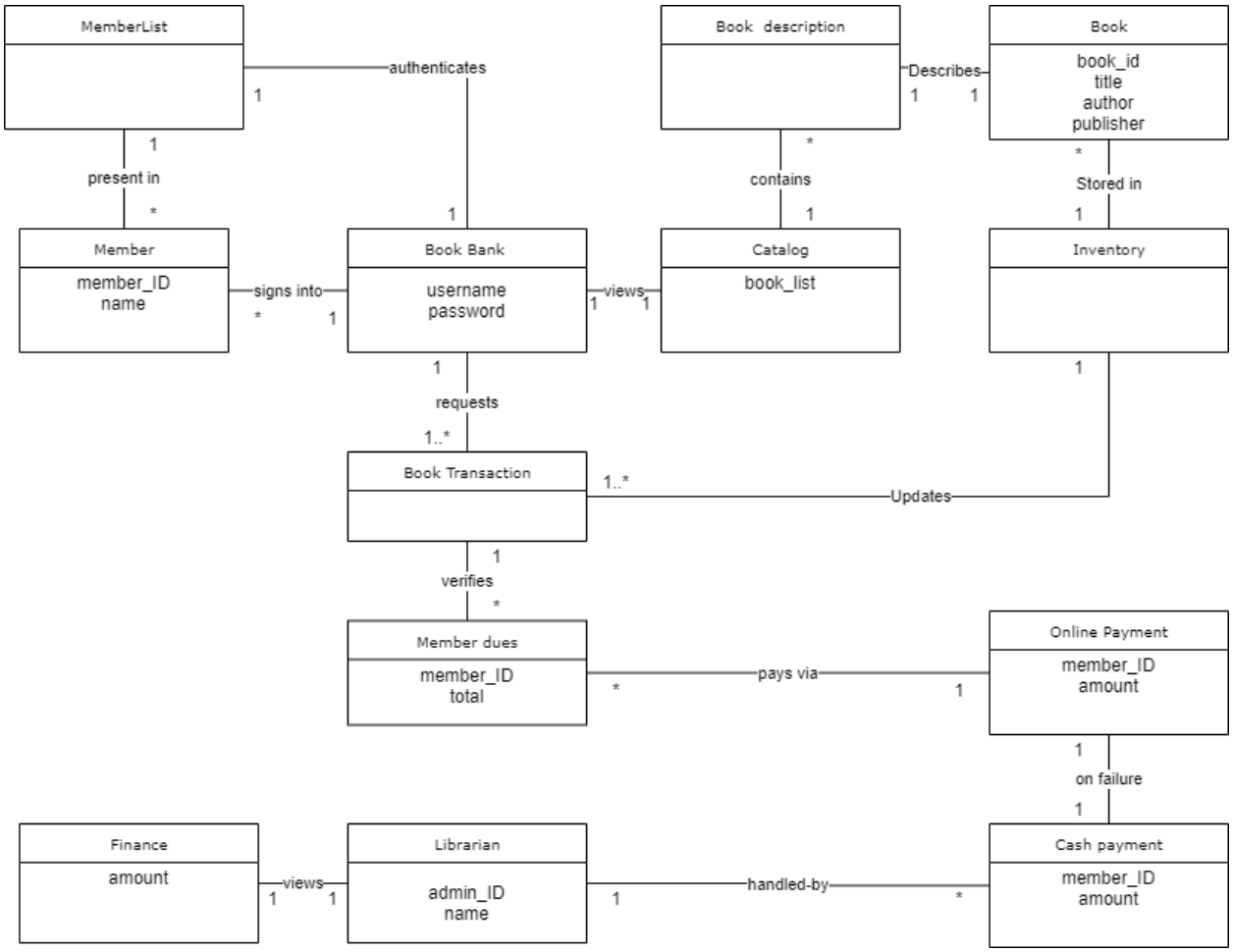
  The composition is a part of aggregation, and it portrays the whole-part relationship. It depicts dependency between a composite (parent) and its parts (children), which means that if the composite is discarded, so will its parts get deleted. It exists between similar objects.



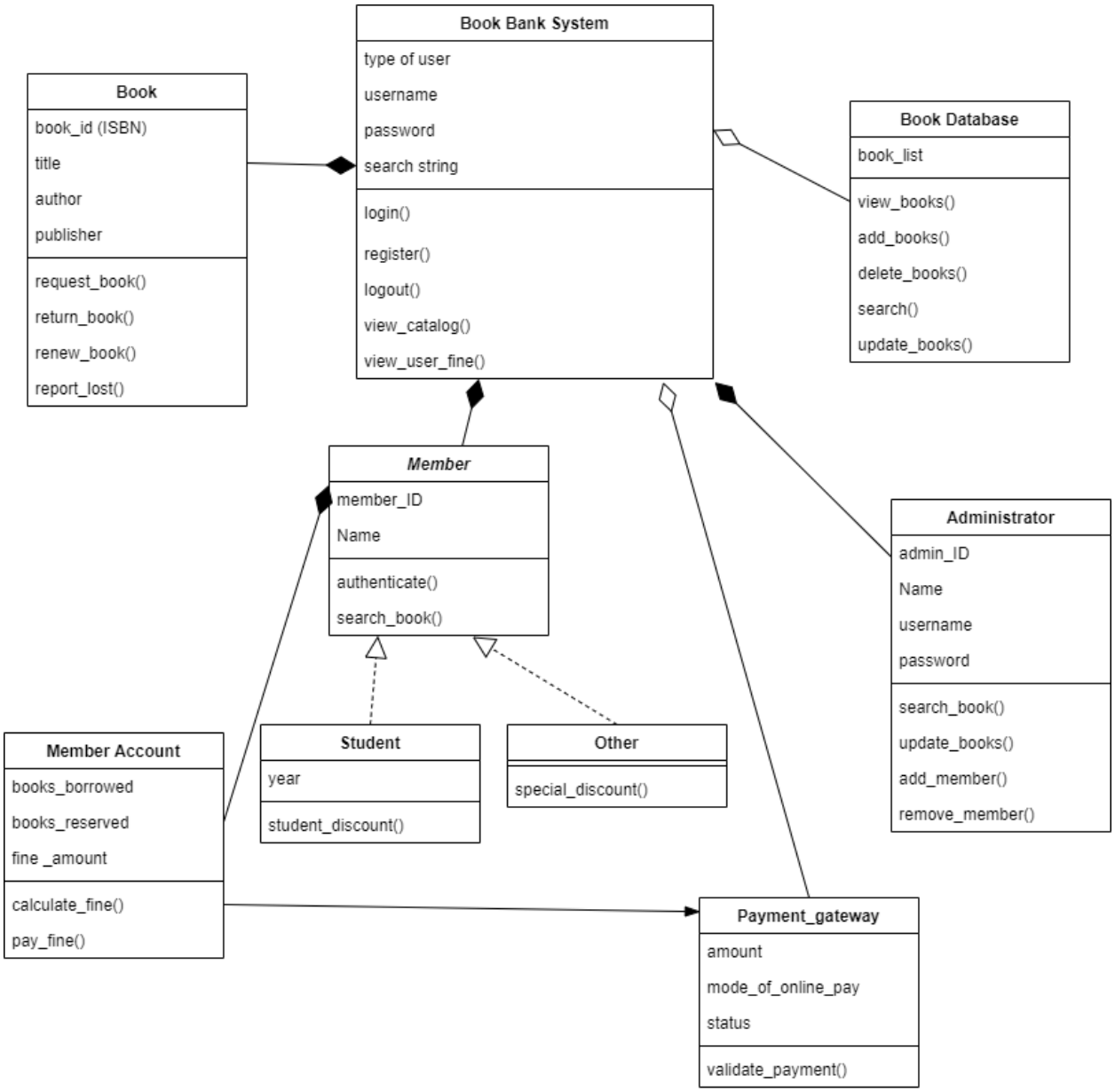
c. Multiplicity based associations (list all possible multiplicity)

1. Book Bank System and Database are connected in a 1:1 relation.
2. Book and Book Bank System are connected in a (0..*):1 relation.
3. Member and Book bank systems are connected in a (0..*):1 relation.
4. Administrator and Book bank system are connected in a 1:1 relation.
5. Book Bank System and Payment gateway are connected in a 1:1 relation.
6. Member and Member accounts are connected in a (0..*):1 relation.
7. Student and Member are connected in a (0..1):(0..*) relation.
8. Other and Member are connected in a (0..1):(0..*) relation.
9. Member Account and Payment gateway are connected in a 1:1 relation.

Domain Model Diagram



Class Diagram



Documentation

The domain model and the class diagram shows the conceptual modeling of the book bank management system and the flow of the scenario is shown in detail. The model helps in implementation of the entire book bank management system. All the functions and roles of people is mentioned and the entire working of the system is represented in these diagrams.

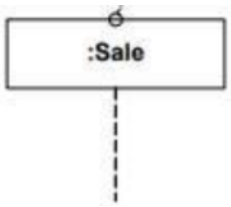
UML Interaction Diagrams

AIM

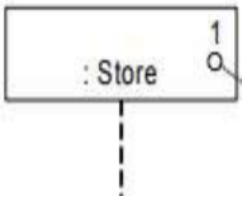
To design an interaction diagram for book bank management systems.

UML Notations for Sequence diagram

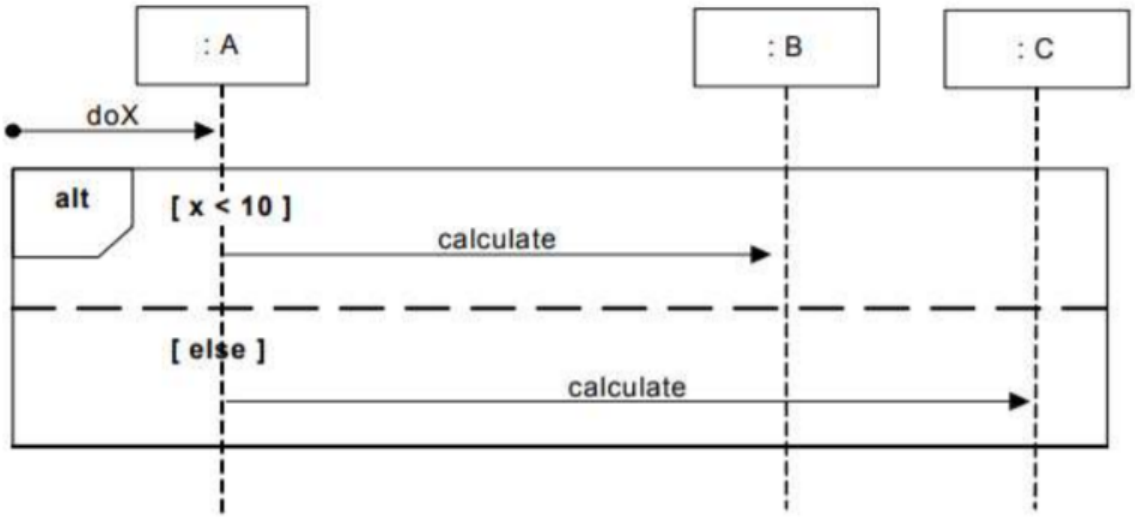
1.Class



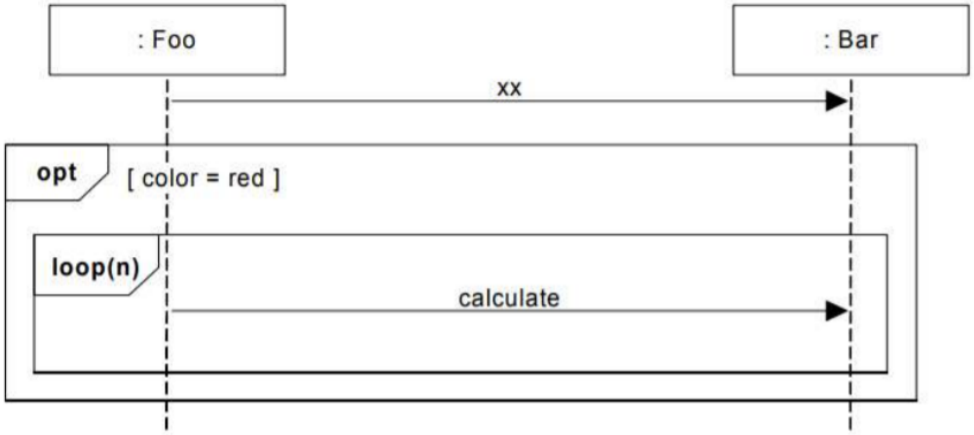
2.Singleton Class



4.Mutually exclusive interactions

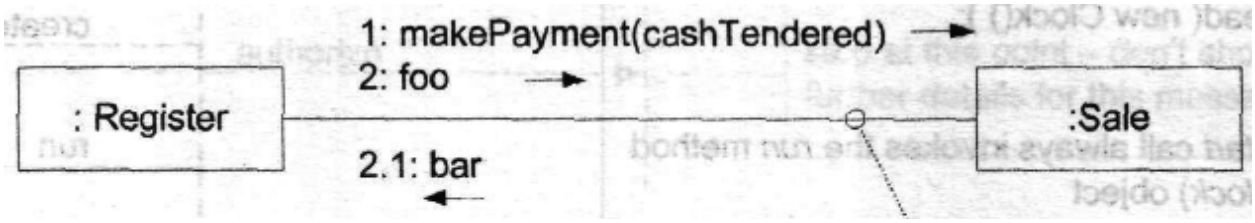


5. Nested frame

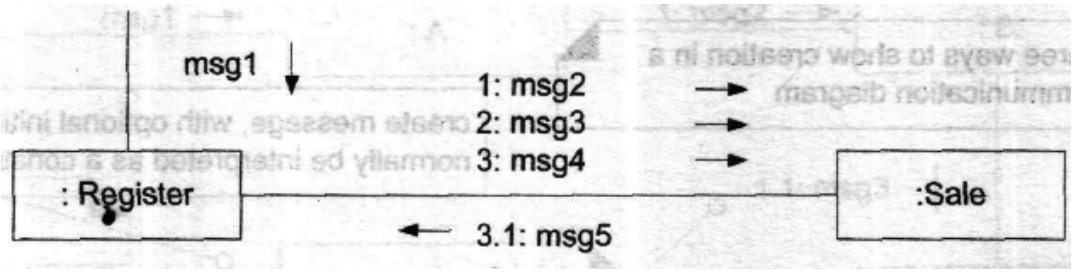


UML Notations for Communication diagram

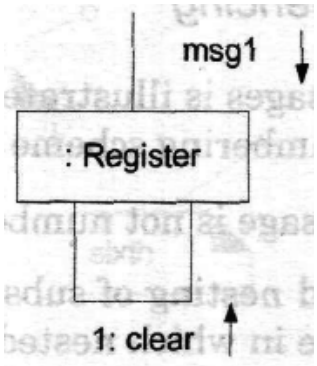
1.Links



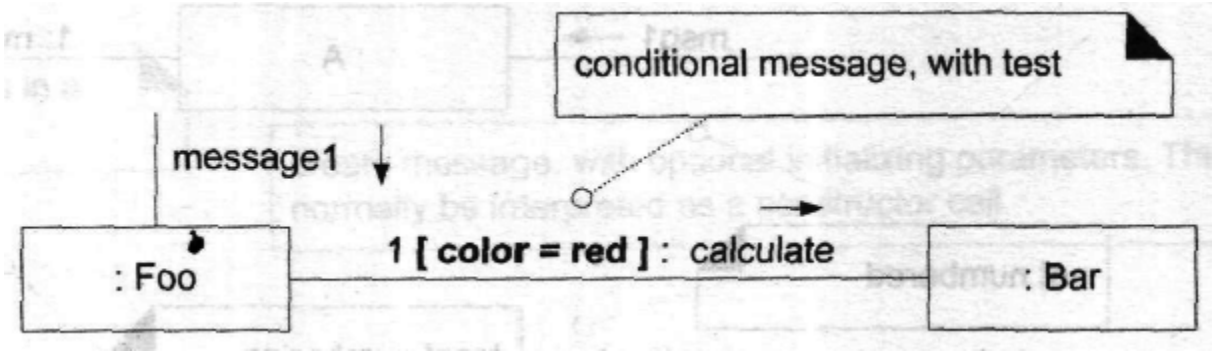
2.Messages.



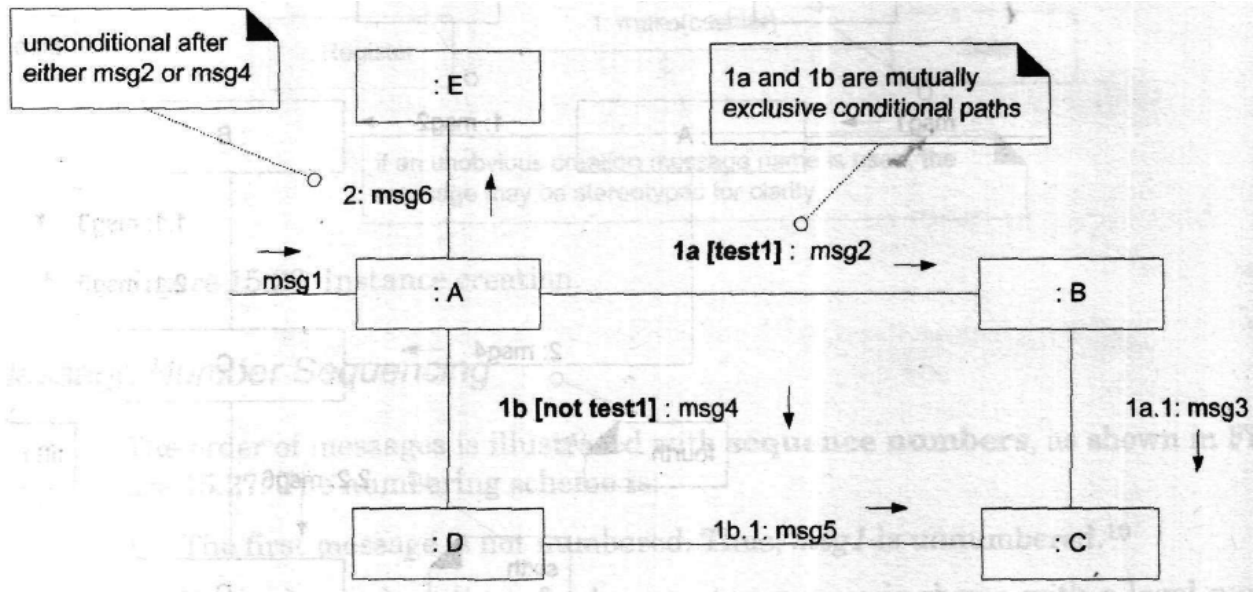
3. Message to this.



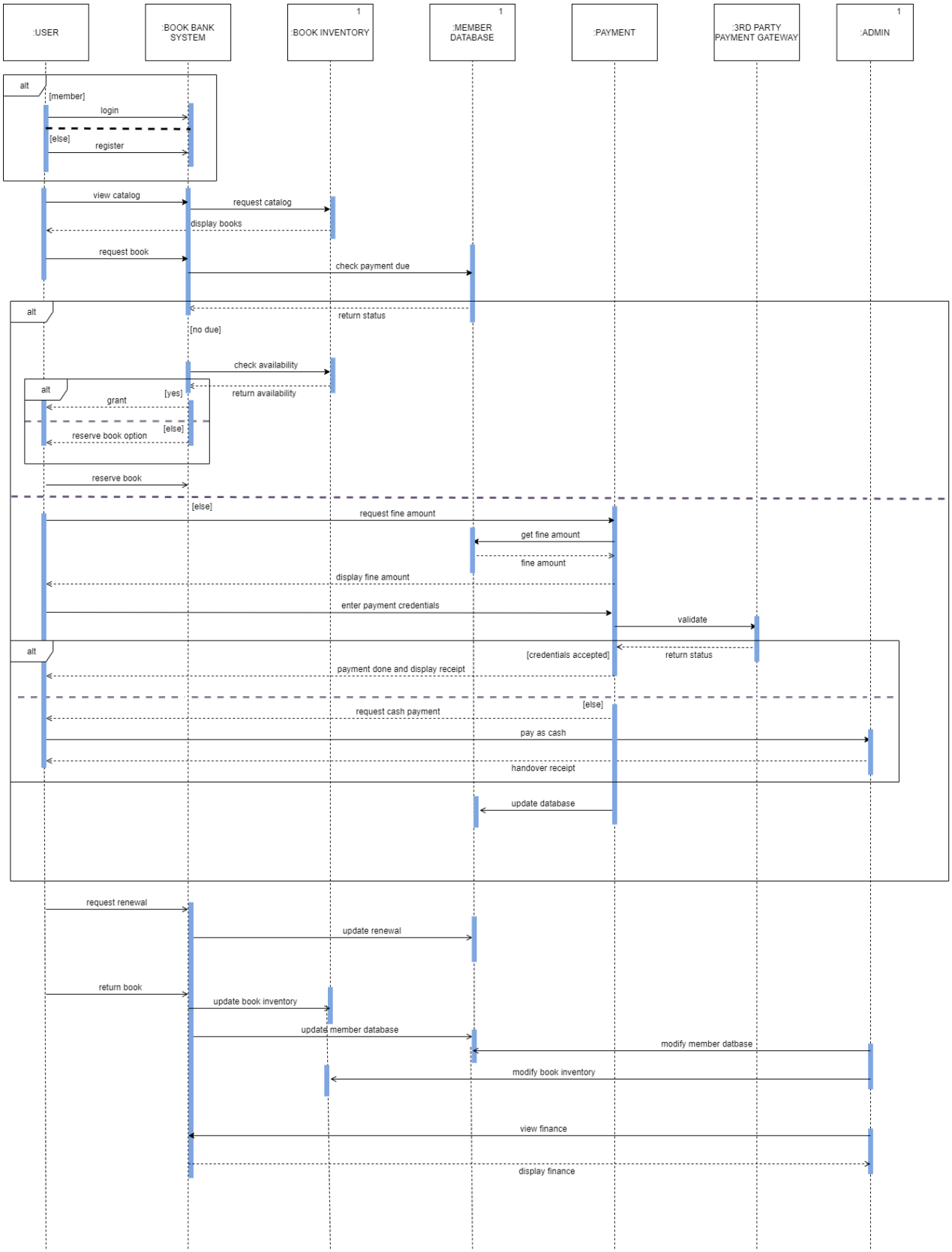
4.Conditional messages:



5. Mutually exclusive messages:

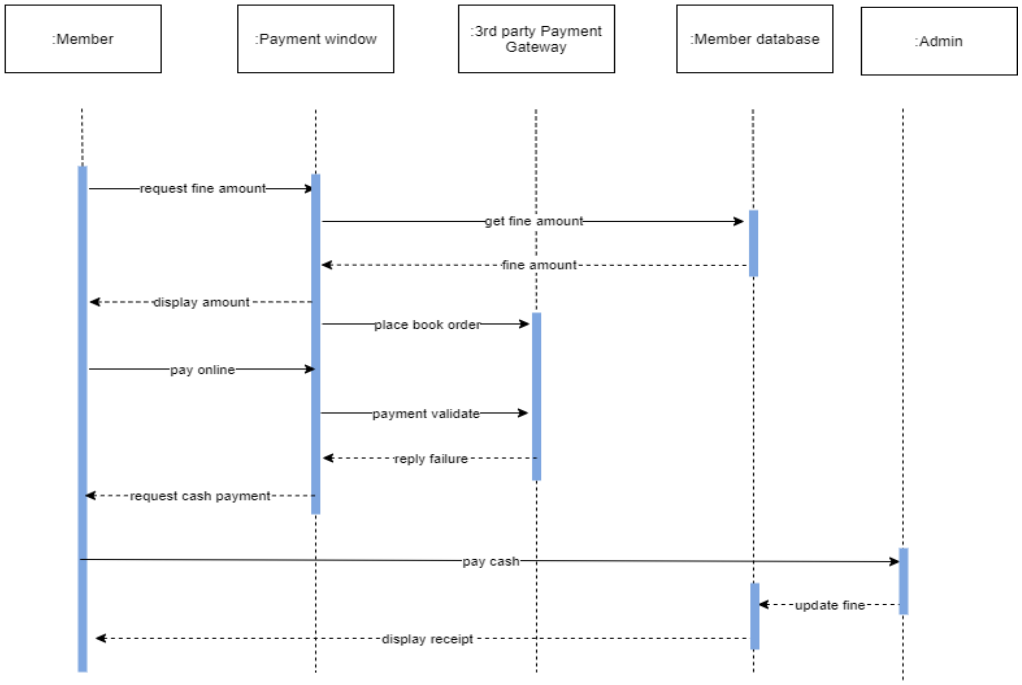


Sequence Diagram-Main success

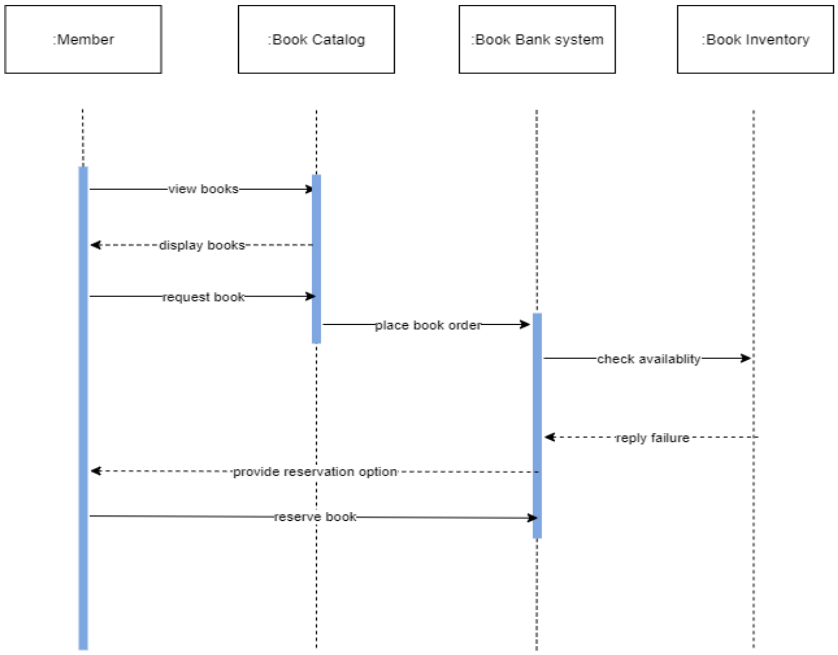


Sequence Diagram - Alternate Path

Alternate scenario 1- Payment gateway failed

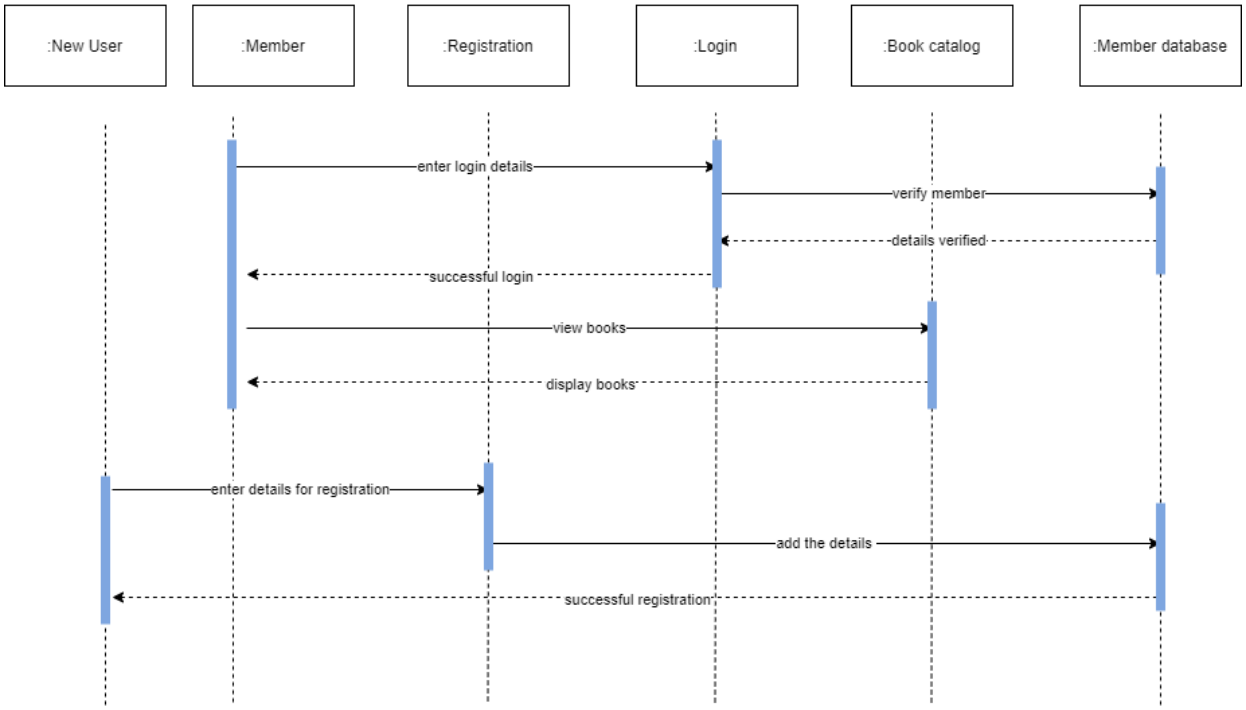


Alternate scenario 2- book not available

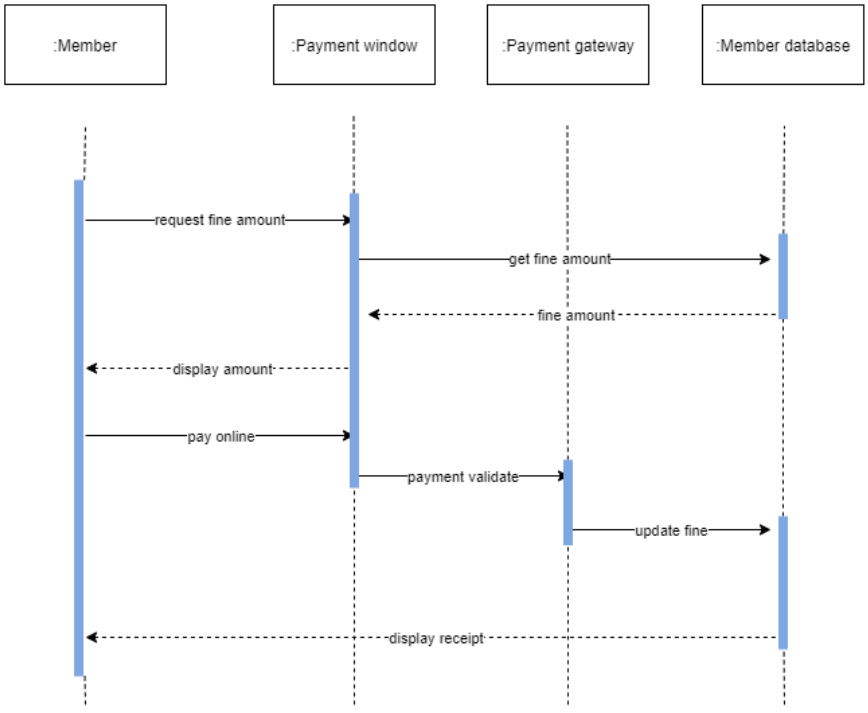


Sequence Diagram - Sub Function

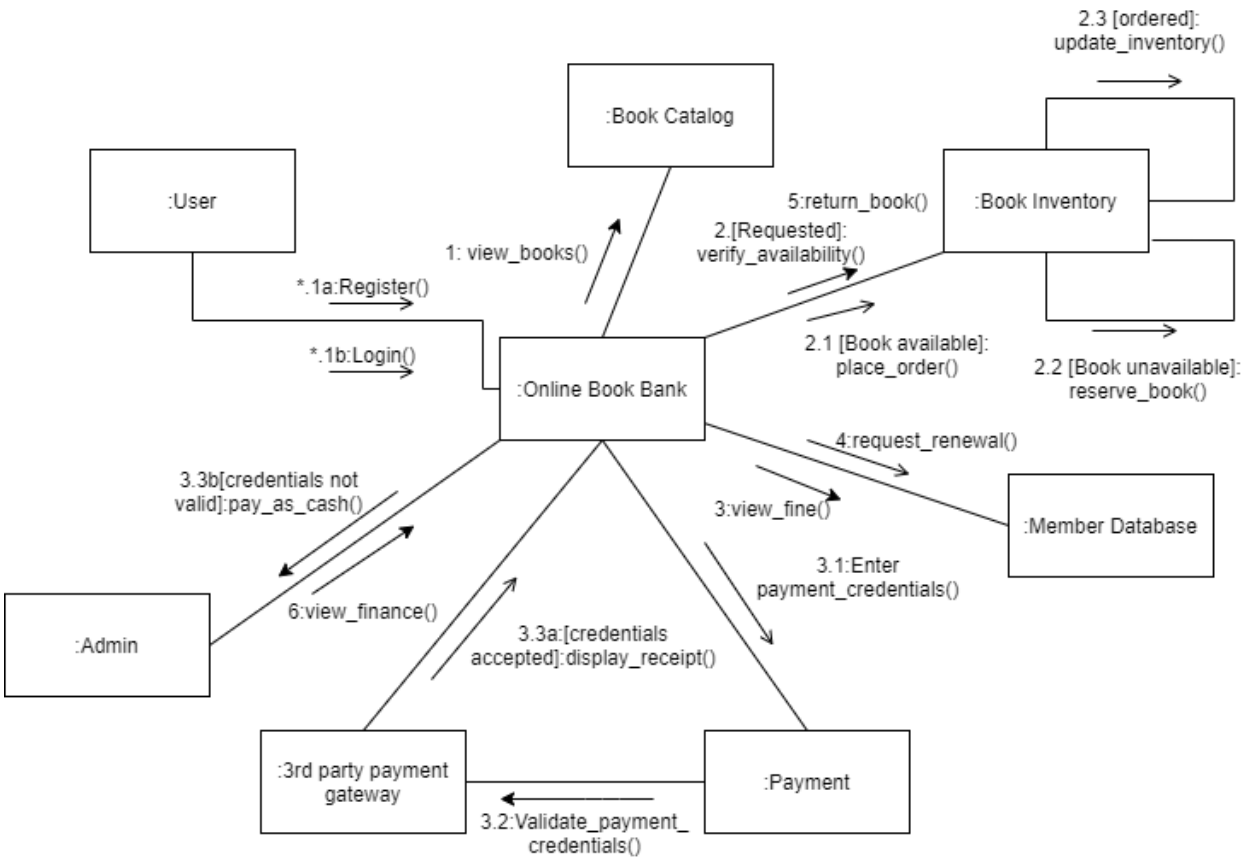
Sub-function 1: User registration/ Login



Sub-function 2: Payment



Communication Diagram



Documentation:

The UML interaction diagrams of the Book Bank System illustrate how objects interact via messages. The diagrams show the flow of the model with respect to time.The model helps in understanding the entire book bank management system flow with respect to time. The various scenarios and sub functions are also shown .

STATE MACHINE AND ACTIVITY DIAGRAM

AIM

To design a state machine and activity diagram for book bank management systems.

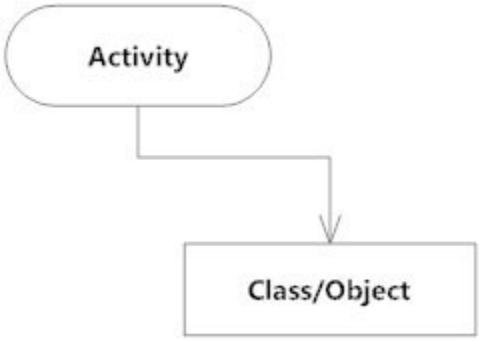
UML notations of the activity diagram:

1. 

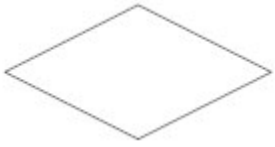
Activity

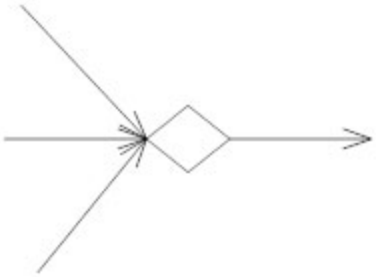
2. 
Start Point/Initial State

3. 
Action Flow

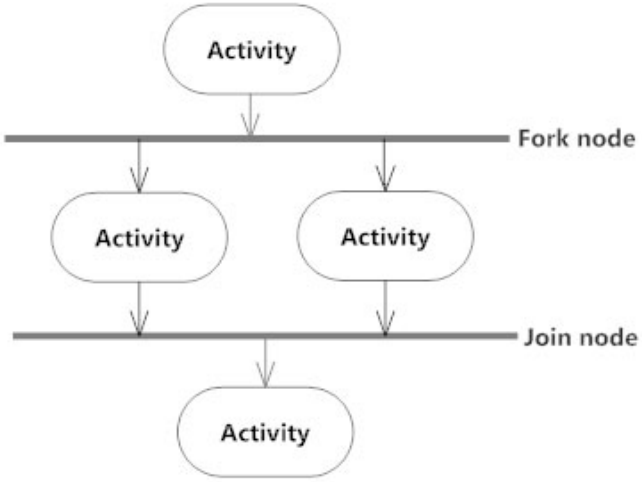
4. 

Object Flow

5. 
Decision Symbol

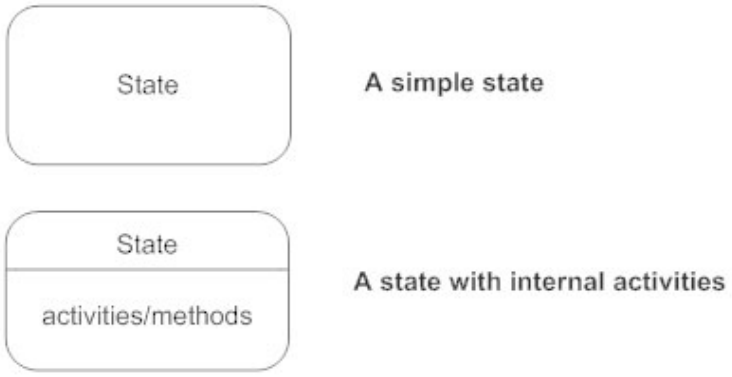
6. 

7. Synchronization



8. 

UML notations for state diagram:

1. 

2. 

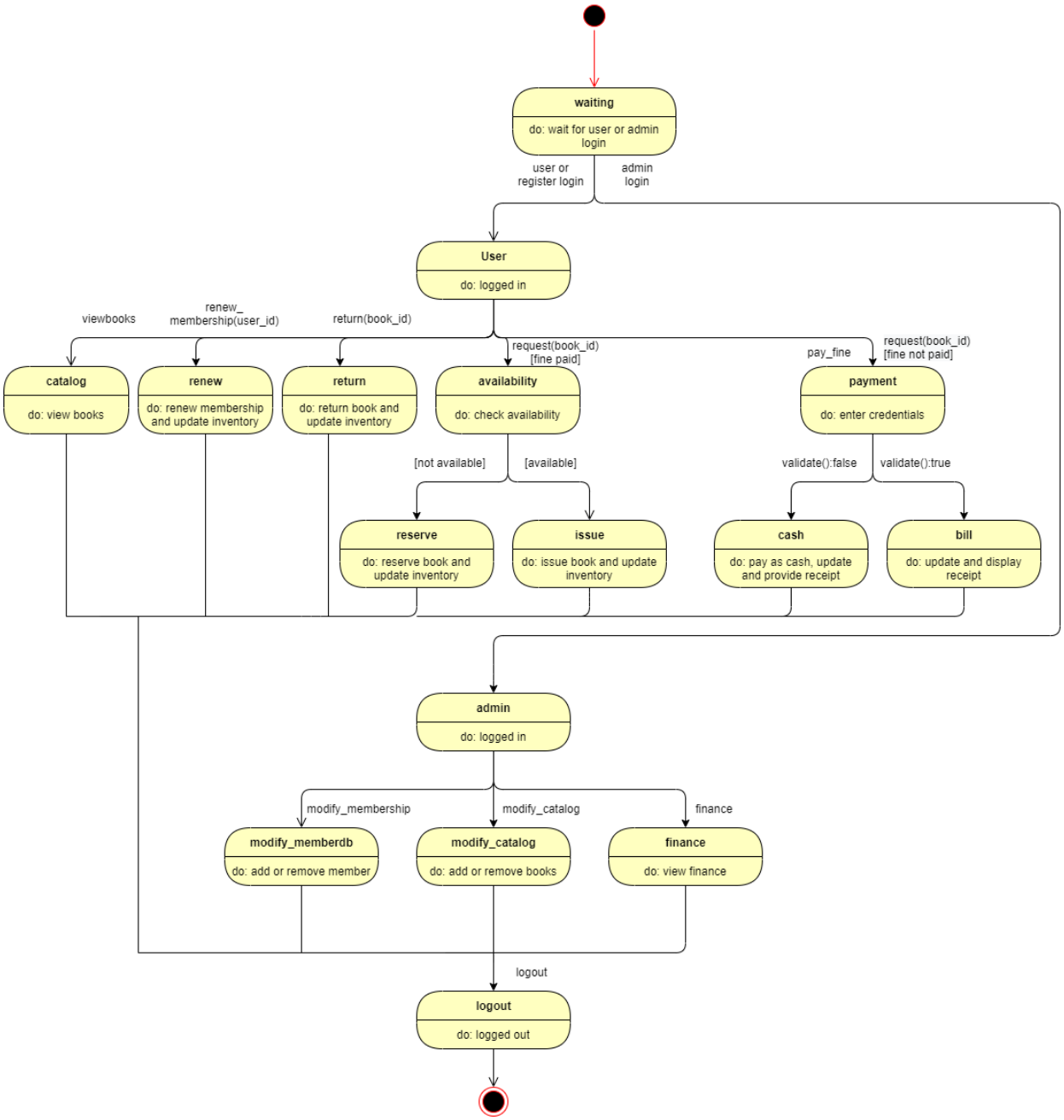
3. 

4. 

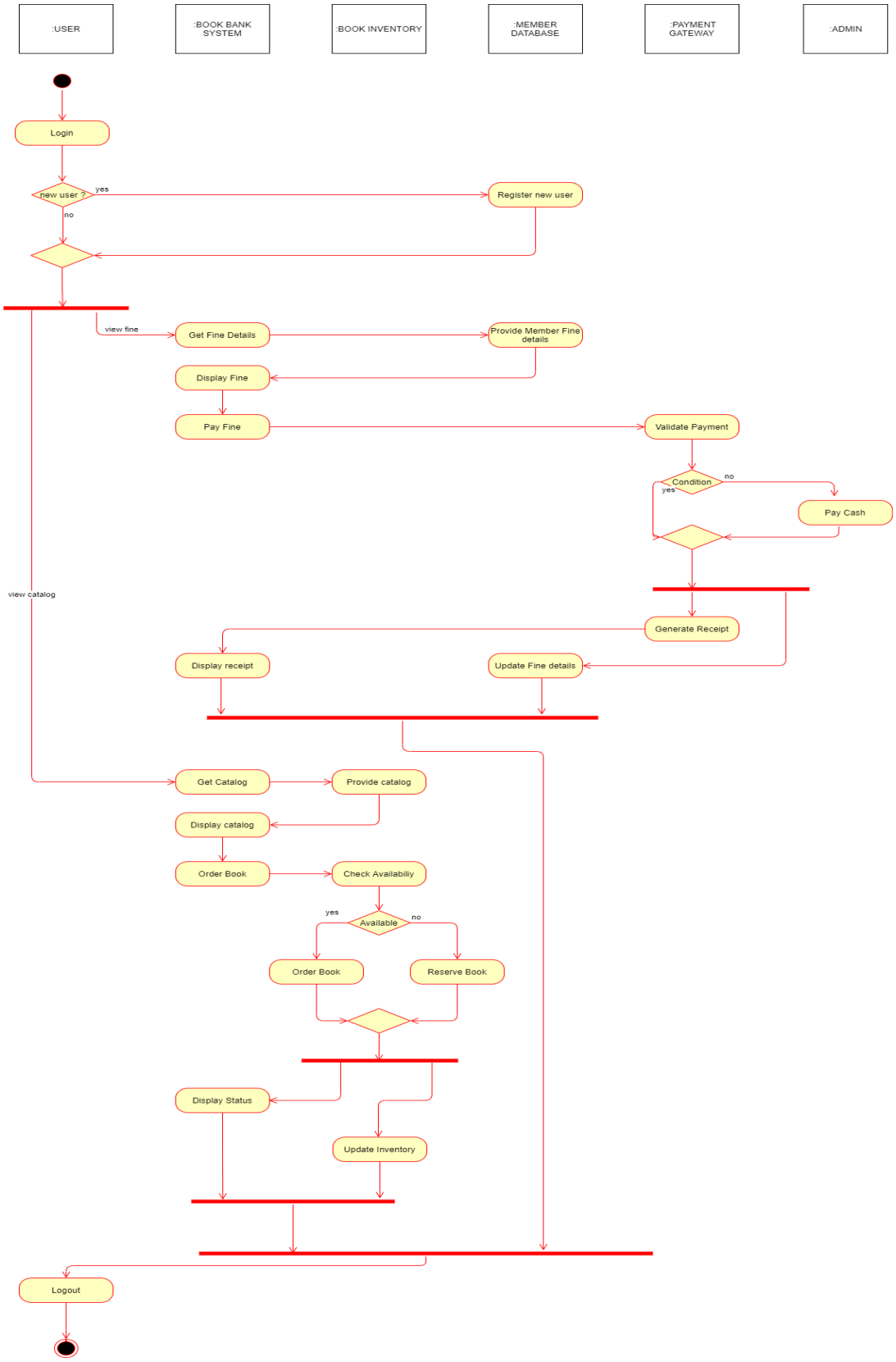
Identification of states

- Waiting
- User
- Catalog
- Renew
- Return
- Availability
- Payment
- Reserve
- Issue
- Cash
- Bill
- Admin
- Modify_memberdb
- Modify_Catalog
- Finance
- Logout

State Machine Diagram



Activity Diagram



Documentation:

The state machine diagram defines the dynamic behaviour of an individual object and the activity diagram describes the workflow behaviour and process flows in the Book Bank Management System.The model helps in implementation of the entire book bank management system.

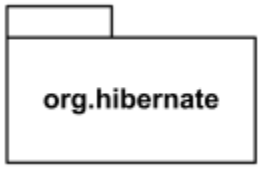
Package Diagram:

Aim:

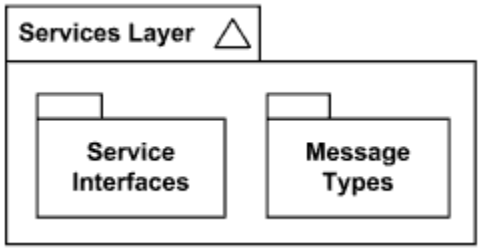
To design a package diagram for a book bank management system.

UML Notations for package diagram:

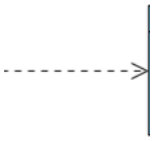
1.Package



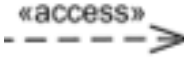
2.Model



3.Dependency

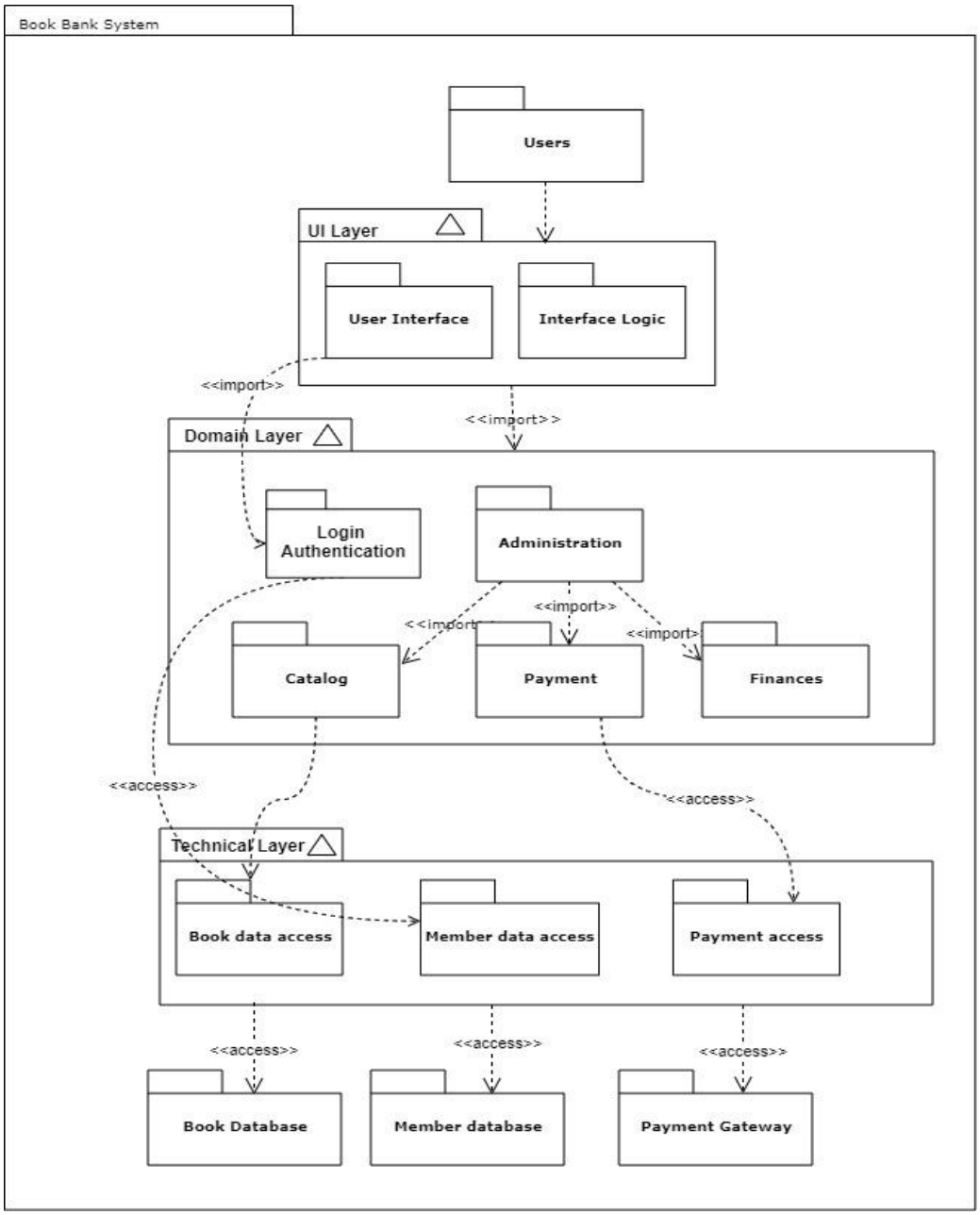


4.Access



5.Import

Diagram:



Documentation:

The package diagram depicts the dependencies between the packages of the Book Bank Management system. It also shows both structure and dependencies between sub−systems or modules.The model helps in implementation of the entire book bank management system.

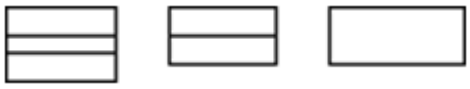
Component and Deployment Diagram:

Aim:

To design component and deployment diagram for book bank management system.

UML notations for component diagram:

1. Component 

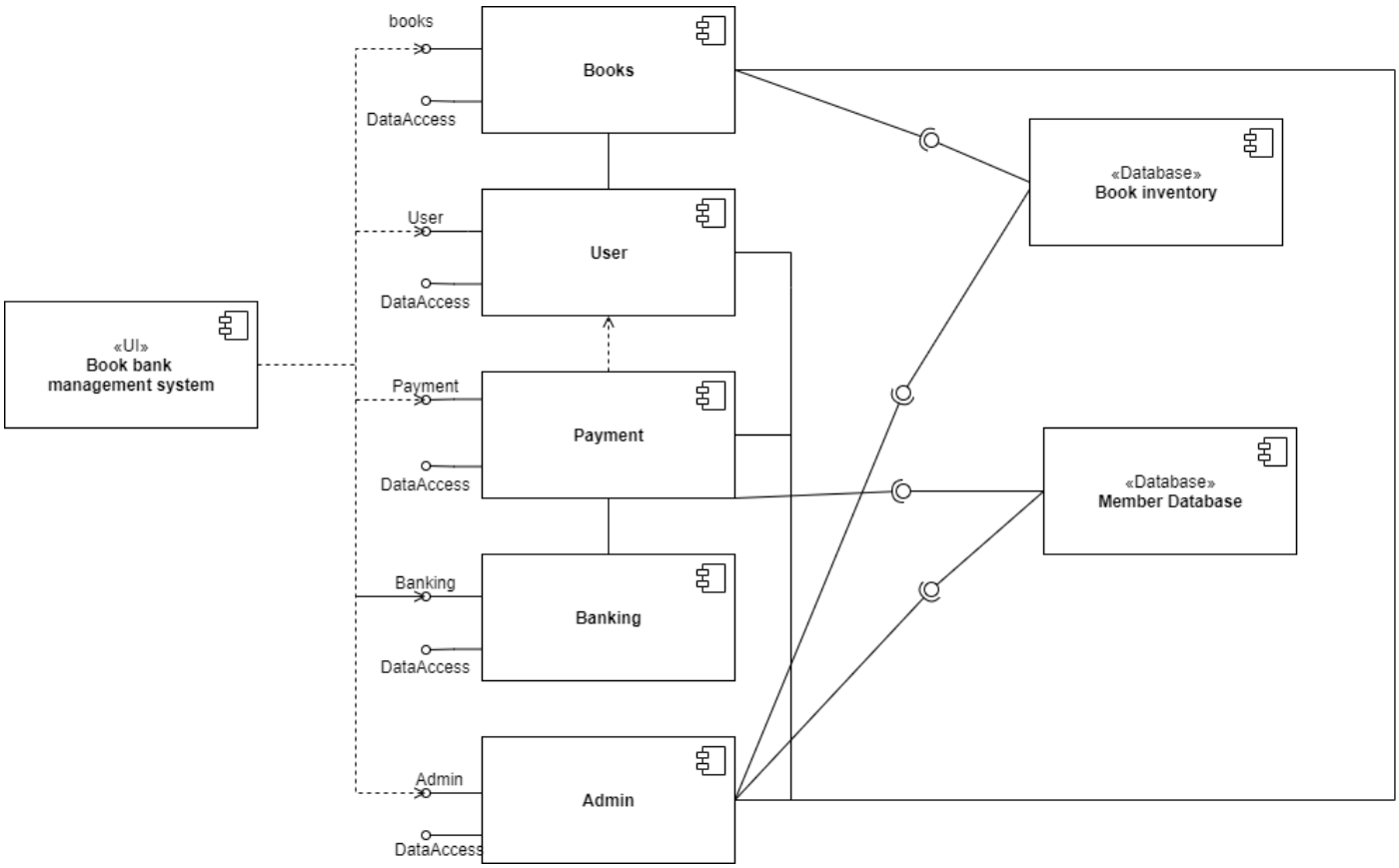
2. Class / Interface / Object 
3. Relation / Association 

List of components identified from class and use case diagram:

1. Books
2. User
3. Payment
4. Administrator
5. Book inventory
6. Member database
7. Member account
8. Student
9. Register
10. Login
11. View catalog

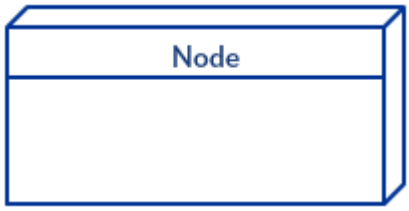
12. Request book
13. Issue book
14. Reserve book
15. Pay fine
16. Barcode scanner
17. Book return

Component diagram:



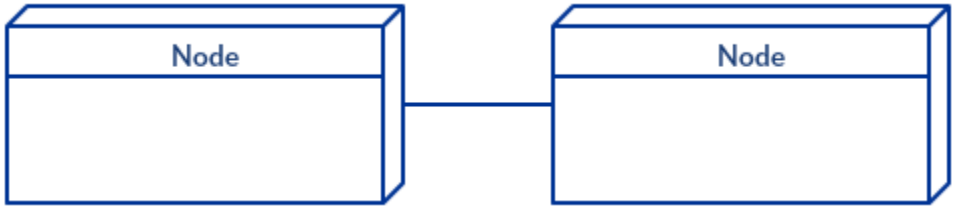
UML notations for deployment diagram:

1. Node



2. Artifact

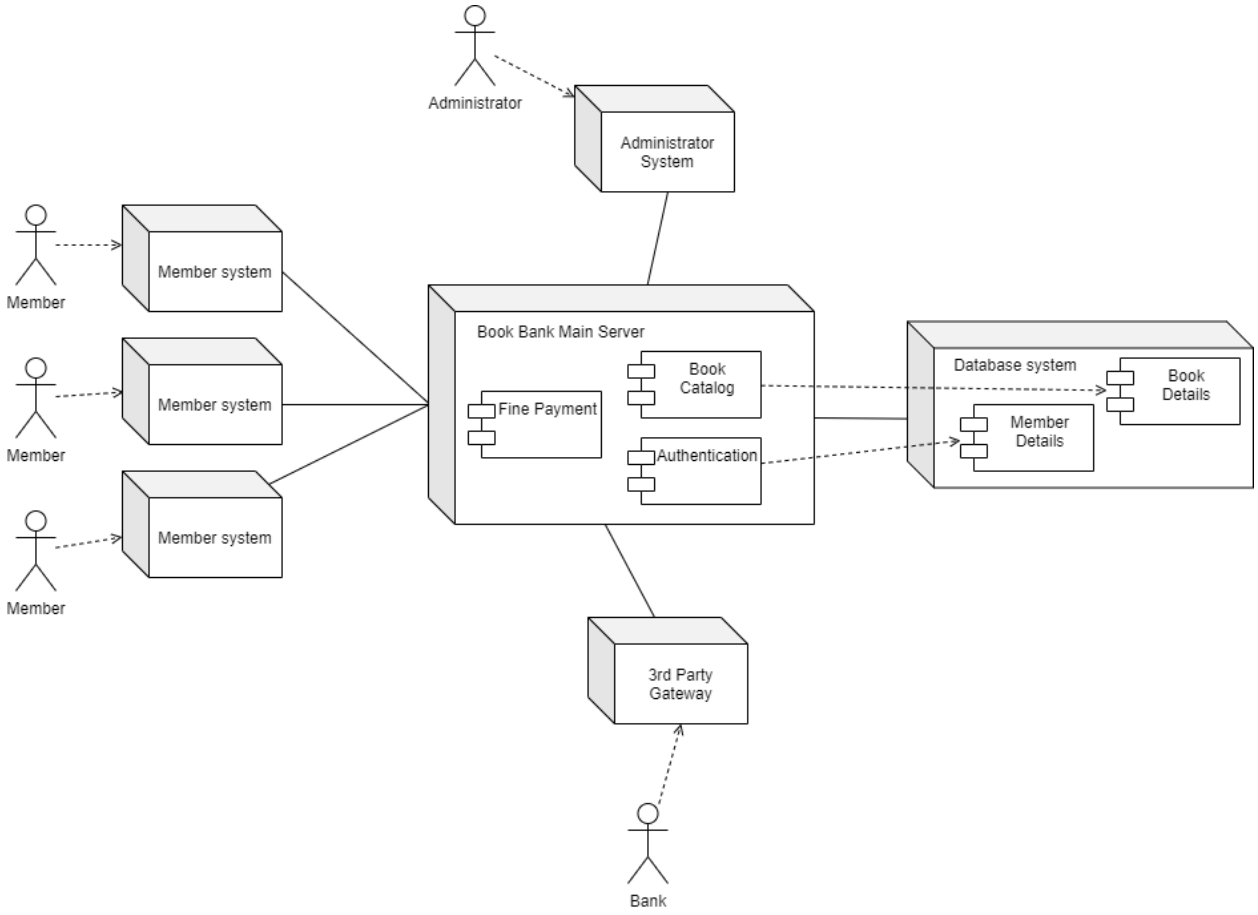
3. Communication association



List of nodes from component diagram:

1. Books
2. User
3. Payment
4. Banking
5. Admin
6. Book inventory
7. Member database

Deployment Diagram:



Documentation:

Component diagram shows how the physical components of a system are organised , it allows you to combine deployment nodes with components to show which components run on each node. The deployment diagram shows the structure of the nodes on which the components are deployed. These help to visualize the organization and relationships among components of the Book Bank Management System.