BVRIT HYDERABAD College of Engineering for Women

(Approved by AICTE | Affiliated to JNTUH | Accredited by NAAC with Grade 'A' &NBA for CSE, ECE, EEE, & IT)
Bachupally, Hyderabad-500090

Department of CSE(Artificial Intelligence and Machine Learning)

Department of

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Certified that this is the bonafide record of the work done by

Miss.....Registrationno.....of.....

Class.....Year.....Semester.....in ..... Laboratory

Date: *Head of the Dept.* *Staff Incharge*

Regd no. .....

Submitted for the University Practical Examination held on

.....

Internal Examiner. *External Examiner*

INDEX

BOOK BANK SYSTEM

1. Problem statement

A Book Bank lends books and magazines to member, who is registered in the system. Also it handles the purchase of new titles for the Book Bank. Popular titles are brought into multiple copies. Old books and magazines are removed when they are out or date or poor in condition. A member can reserve a book or magazine that is not currently available in the book bank, so that when it is returned or purchased by the book bank, that person is notified. The book bank can easily create, replace and delete information about the tiles, members, loans and reservations from the system.

2. Software Requirement Specification Document

2.1 Functional Requirements

If the entire process of 'Issue of Books or Magazines' is done in a manual manner then it would take several months for the books or magazines to reach the applicant. Since the number of students for Book Bank is increasing every year, an Automated System becomes essential to meet the demand. So, this system uses several programming and database techniques to elucidate the work involved in this process. The system has been carefully verified and validated to satisfy it.

The System provides an online interface to the user where they can fill in their personal details and submit the necessary documents (may be by scanning). The authority concerned with the issue of books can use this system to reduce his workload and process the application in a speedy manner.

2.2 Tools and Technology Requirements

The following are the list of software requirements we are using to implement this application.

- Client-Side Technologies: HTML, CSS
- Scripting Language : JavaScript
- Business Logic Development Language : JSP
- Database Connectivity : JDBC
- Database : MYSQL
- Operating System : Windows 10
- Documentation : MS-Office

Hardware Requirements:

The following are the hardware requirements with minimum configuration to get better performance of our application.

Processor : Pentium-IV Systems

RAM : 512MB or above

Hard Disk : 20GB or above

Input and Output Devices : Keyboard, Monitor

Deployment Requirements:

Front end : Java 1.8

Technologies : JSP and JDBC

Database : MYSQL server

Web Server : Apache Tomact 8.5

2.3 Non-functional Requirements

Performance:

It is the response time, utilization and throughput behaviour of the system. Care is taken so as to ensure a system with comparatively high performance.

Maintainability: All the modules must be clearly separate to allow different user interfaces to be developed in future. Through thoughtful and effective software engineering, all steps of the product throughout its life time. All development will be provided with good documentation.

Reliability: The software should have less failure rate.

3. Design Documents

The purpose of a design is to describe how the enhancements will be incorporated into the existing project. It should contain samples of the finished product. This could include navigational mechanism screenshots, example reports, and UML diagrams.

i. Use case diagrams

A use case diagram is a diagram that shows a set of use cases and actors and their relationships.

Common Properties:

A use case diagram is just a special kind of diagram and shares the same common properties as do all other diagrams - a name and graphical contents that are a projection into a model. What distinguishes a use case diagram from all other kinds of diagrams is its content.

Contents:

Use case diagrams commonly contain

- Use cases
- Actors
- Dependency, generalization, and association relationships

Common Uses:

The use case diagrams are used to model the static use case view of a system. This view primarily supports the behaviour of a system - the outwardly visible services that the system provides in the context of its environment.

ii. Class Diagrams

A class diagram is a diagram that shows a set of classes, interfaces, and collaborations and their relationships.

Class diagram commonly contain the following things:

- Classes
- Interfaces
- Collaborations
- Dependency, generalization and association relationships

Common Uses:

Class diagrams are used to model the static design view of a system. While modelling the

static design view of a system, class diagrams are used in one of the three ways:

To model the vocabulary of a system

To model simple collaborations

To model a logical database schema

iii. Sequence Diagrams

A sequence diagram emphasizes the time ordering of messages. Sequence diagram is formed by first placing the objects that participate in the interaction at the top of your diagram, across the X axis. Typically, you place the object that initiates the interaction at the left, and increasingly more subordinate objects to the right. Next, you place the messages that these objects send and receive along the Y axis, in order of increasing time from top to bottom. This gives the reader a clear visual cue to the flow of control over time.

Sequence diagrams have two features that distinguish them from collaboration diagrams.

First, there is the object lifeline. An object lifeline is the vertical dashed line that represents the existence of an object over a period.

Second, there is the focus of control. The focus of control is a tall, thin rectangle that shows the period during which an object is performing an action, either directly or through a subordinate procedure.

Content:

Sequence diagrams commonly contain

Objects

Links

Messages

Common Use:

Modeling Flows of Control by Time Ordering.

iv. Collaboration Diagram

The collaboration diagram is used to show the relationship between the objects in a system. Both the sequence and the collaboration diagrams represent the same information but differently. Instead of showing the flow of messages, it depicts the architecture of the object residing in the system as it is based on object-oriented programming. An object consists of

several features. Multiple objects present in the system are connected to each other. The collaboration diagram, which is also known as a communication diagram, is used to portray the object's architecture in the system. **v. Component Diagrams**

Component diagrams are used to model the physical aspects of a system. Physical aspects are the elements such as executables, libraries, files, documents, etc. which reside in a node. Component diagrams are used to visualize the organization and relationships among components in a system.

Component diagram commonly contain:

Components

Interfaces

Relationships

v. Activity Diagrams

An activity diagram shows the flow from activity to activity. An activity is an ongoing non atomic execution within a state machine. Actions encompass calling another operation, sending a signal, creating or destroying an object, or some pure computation, such as evaluating an expression. Graphically, an activity diagram is a collection of vertices and arcs.

Common Properties:

An activity diagram is just a special kind of diagram and shares the same common properties as do all other diagrams - a name and graphical contents that are a projection into a model. What distinguishes an interaction diagram from all other kinds of diagrams is its content.

Content: Activity diagrams commonly contain

· Activity states and action states

· Transitions · Objects

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· To model a workflow

· To model an operation

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· Components

· Interfaces

· Relationships

vi. Statechart Diagrams

There are various types of test. Each test type addresses a specific testing requirement. Statechart diagram is used to describe the states of different objects in its life cycle. Emphasis is placed on the state changes upon some internal or external events. These states of objects are important to analyze and implement them accurately. Statechart diagrams are very important for describing the states. Statechart diagrams are also used for forward and reverse engineering of a system. However, the main purpose is to model the reactive system

3.2 Testing Document

i. Overview of Testing

The purpose of testing is to discover errors. Testing is the process of trying to discover every conceivable fault or weakness in a work product. It provides a way to check the functionality of components, sub-assemblies, assemblies and/or a finished product It is the process of exercising software with the intent of ensuring that the Software system meets its requirements and user expectations and does not fail in an unacceptable manner. There are various types of tests. Each test type addresses a specific testing requirement.

ii. Stages of Testing:

Unit testing:

Unit testing involves the design of test cases that validate that the internal program logic is functioning properly, and that program inputs produce valid outputs. All decision branches and internal code flow should be validated. It is the testing of individual software units of the application. It is done after the completion of an individual unit before integration. This is a structural testing, that relies on knowledge of its construction and is invasive. Unit tests perform basic tests at component level and test a specific business process, application, and/or

system configuration. Unit tests ensure that each unique path of a business process performs accurately to the documented specifications and contains clearly defined inputs and expected results.

Integration testing:

Integration tests are designed to test integrated software components to determine if they run as one program. Testing is event driven and is more concerned with the basic outcome of screens or fields. Integration tests demonstrate that although the components were individually satisfaction, as shown by successfully unit testing, the combination of components is correct and consistent. Integration testing is specifically aimed at exposing the problems that arise from the combination of components.

Types of testing:

White-box testing:

White-box testing, sometimes called glass-box testing, is a test case design method that uses the control structure of the procedural design to derive test cases.

These test cases

- Guarantee that all independent paths within a module have been exercised at least once
- Exercise all logical decisions on their true and false sides
- Execute all loops at their boundaries and within their operational bounds
- Exercise internal data structures to ensure their validity

Black box testing: Also called behavioural testing, focuses on the functional requirements of the software. It enables the software engineer to derive sets of input conditions that will fully exercise all functional requirements for a program. Black-box testing is not an alternative to white-box techniques, but it is a complementary approach.

Black box testing attempts to find errors in the following categories:

- Incorrect or missing functions

Interface errors

Errors in data structures or external database access

Behaviour or performance errors

Initialization and termination errors.

3.3Software Configuration Management

Software Configuration Management is defined as a process to systematically manage, organize, and control the changes in the documents, codes, and other entities during the Software

Development Life Cycle. It is abbreviated as the SCM process in software engineering. The primary goal is to increase productivity with minimal mistakes.

The primary reasons for Implementing Software Configuration Management System are:

There are multiple people working on software which is continually updating

It may be a case where multiple version, branches, authors are involved in a software project, and the team is geographically distributed and works concurrently

Changes in user requirement, policy, budget, schedule need to be accommodated.

Software should be able to run on various machines and Operating Systems

Helps to develop coordination among stakeholders

SCM process is also beneficial to control the costs involved in making changes to a system

3.4 Risk Management

Risk management assists a project team in identifying risks, assessing their impact and probability and tracking risks throughout a software project.

Categories of risks:

Project risks

Technical risks

Business risks

Risk Components:

Performance risk

Cost risk

Support risk

Schedule risk

Risk Drivers:

Negligible

Marginal

Critical

Catastrophic

Risk Table:

Risk Size estimate may be significantly low

- Delivery deadline will be tightened
- Customer will change requirements
- Technology will not meet expectations
- Lack of training on tools
- Inexperienced staff

RISKS	CATEGORY	PROBABILITY (%)	IMPACT
Server breaks down	Project size risk	40%	2
Data loss	Project size risk	30%	2

Security issues (payment must be secure)	Technical risk	20%	3
Duplication of the same seat while booking	Technical risk	20%	1

ST- Staff size and experience risk
BU – Business risk
PS – Project size risk
TE- Technology risk
1- Catastrophic
2- Critical
3- Marginal
4- Negligible

RISK MANAGEMENT PLAN

RISK	TRIGGER	OWNER	RESPONSE	RESOURCE REQUIRED
RISKS WITH RESPECT TO THE PROJECT TEAM				
- Illness or sudden absence of the project team	- Illness / other emergencies / resign	-Project Manager	-Project manager take responsibilities	-Backup resources - proper schedule plan
RISKS WITH RESPECT TO THE CUSTOMER / USER				
- The customer changes initial requirements - The customer is not available when needed	- User change request - Incomplete description during requirement phase - Target user unable to attend testing / assessments	- Senior Technician - Senior Manager - Senior Manager	- Quality Assurance / Control - Change Request Form - Scheduling and customer "booking"	- Quality control checklist - Change Request Form - User Requirement Doc - Project Schedule - Letter of acknowledgement to Customer

4. Design Phase tool

StarUML:

StarUML is an open-source software modelling tool that supports the UML (Unified Modelling Language) framework for system and software modelling. It is based on UML version 1.4, provides different types of diagrams and it accepts UML 2.0 notation. It actively

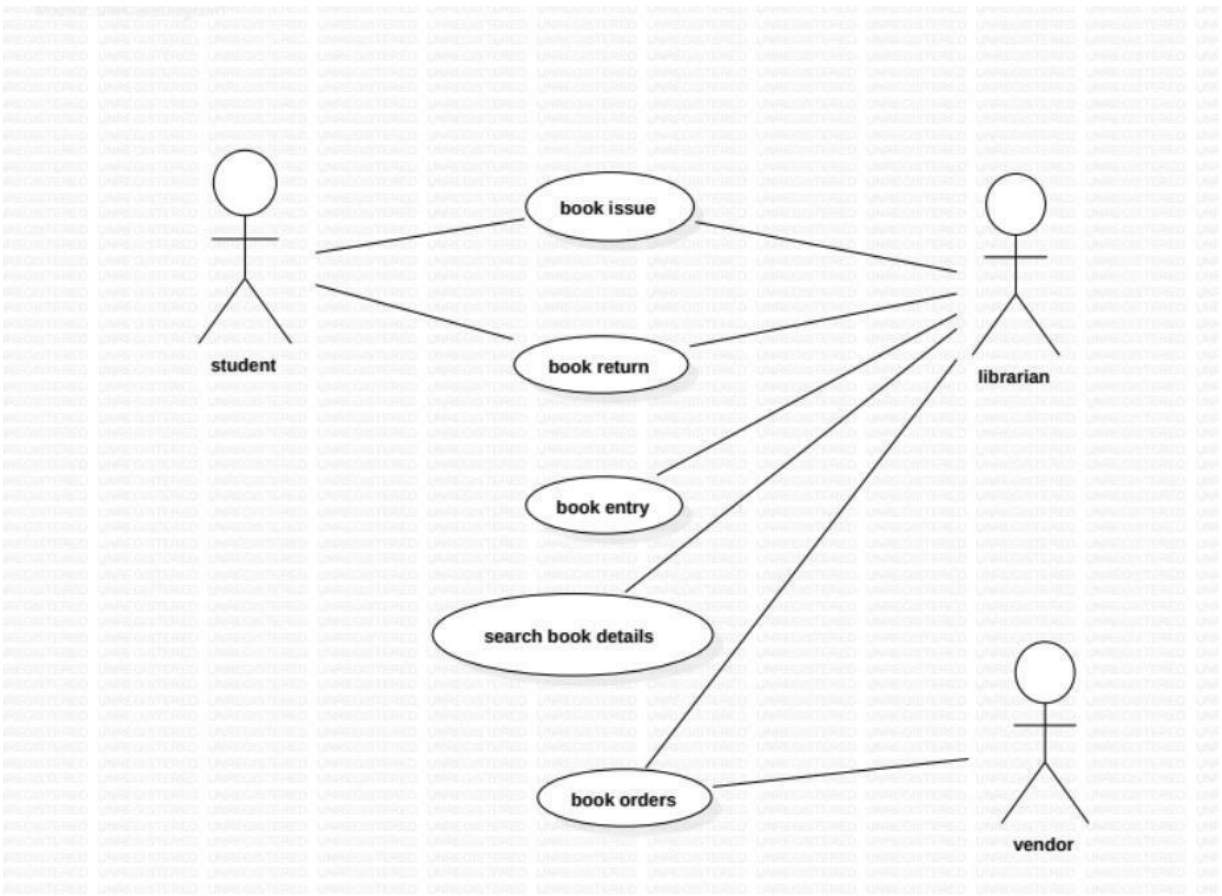
supports the MDA (Model Driven Architecture) approach by supporting the UML profile concept and allowing to generate code for multiple languages.

StarUML supports the following diagram types

1. Use Case Diagram
2. Class Diagram
3. Sequence Diagram
4. Collaboration Diagram
5. State chart Diagram
6. Activity Diagram
7. Component Diagram
8. Deployment Diagram
9. Composite Structure Diagram

5. Design

USE CASE :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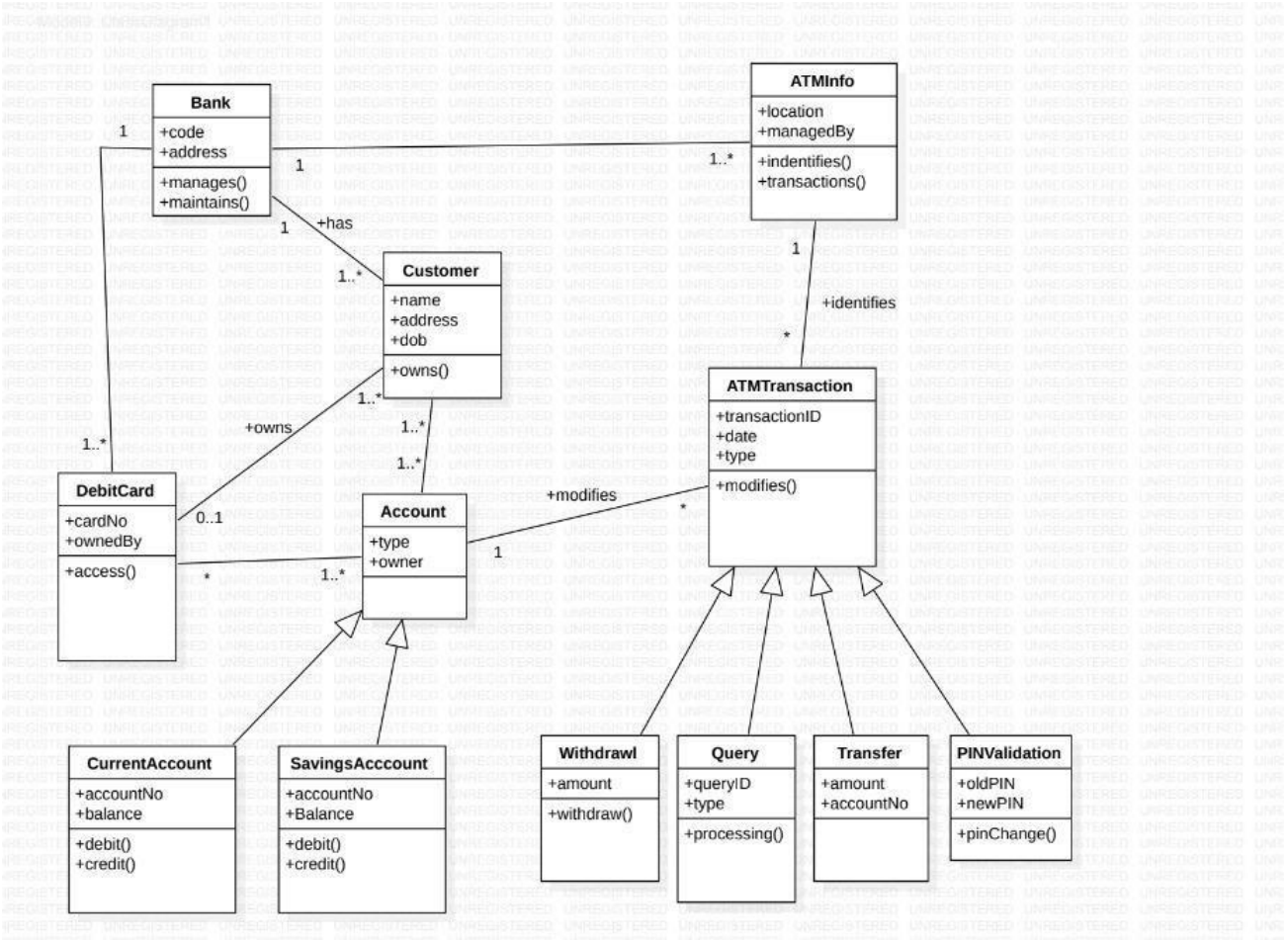
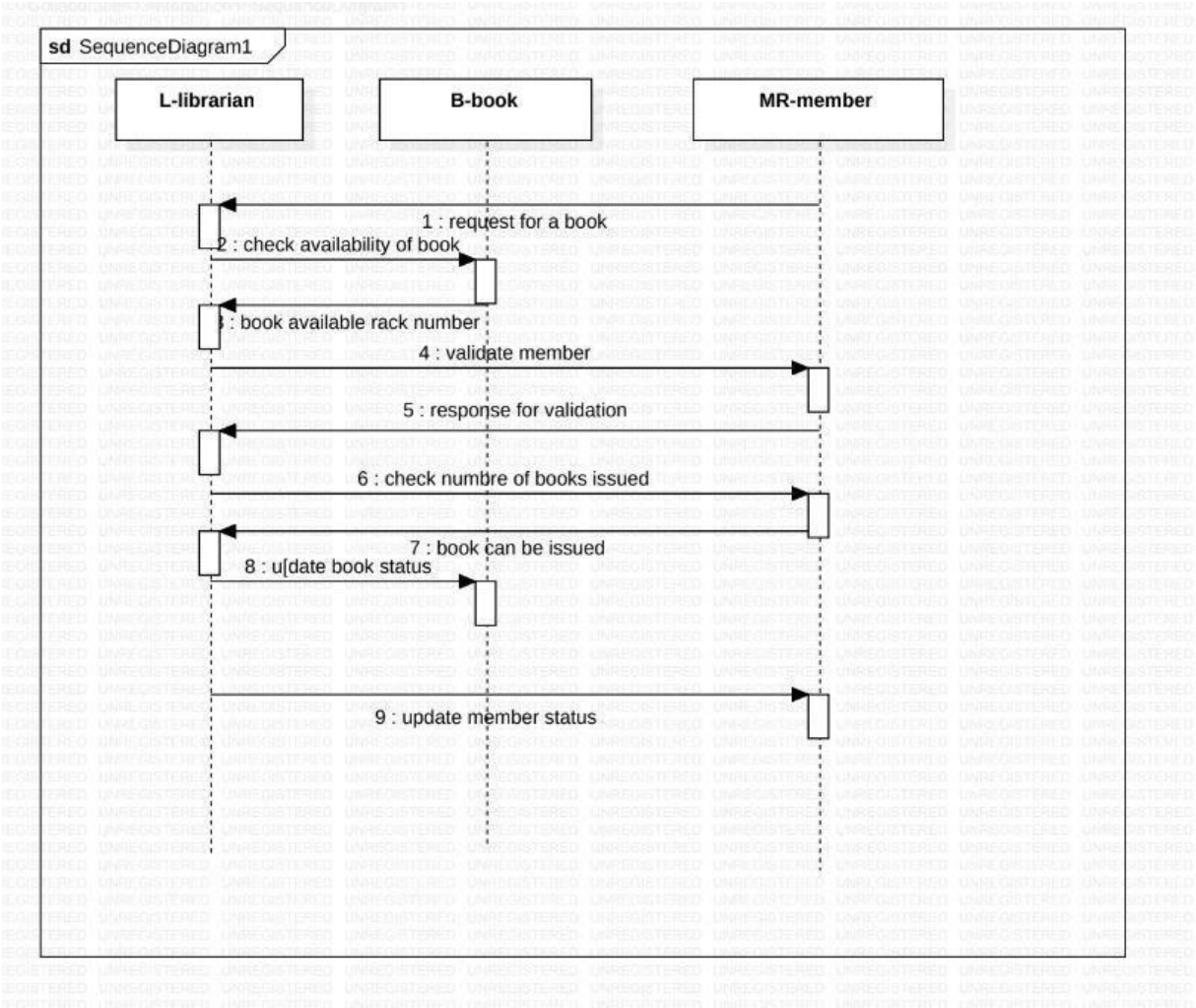
book issue
book return
book entry
search book details
book orders
librarian
vendor

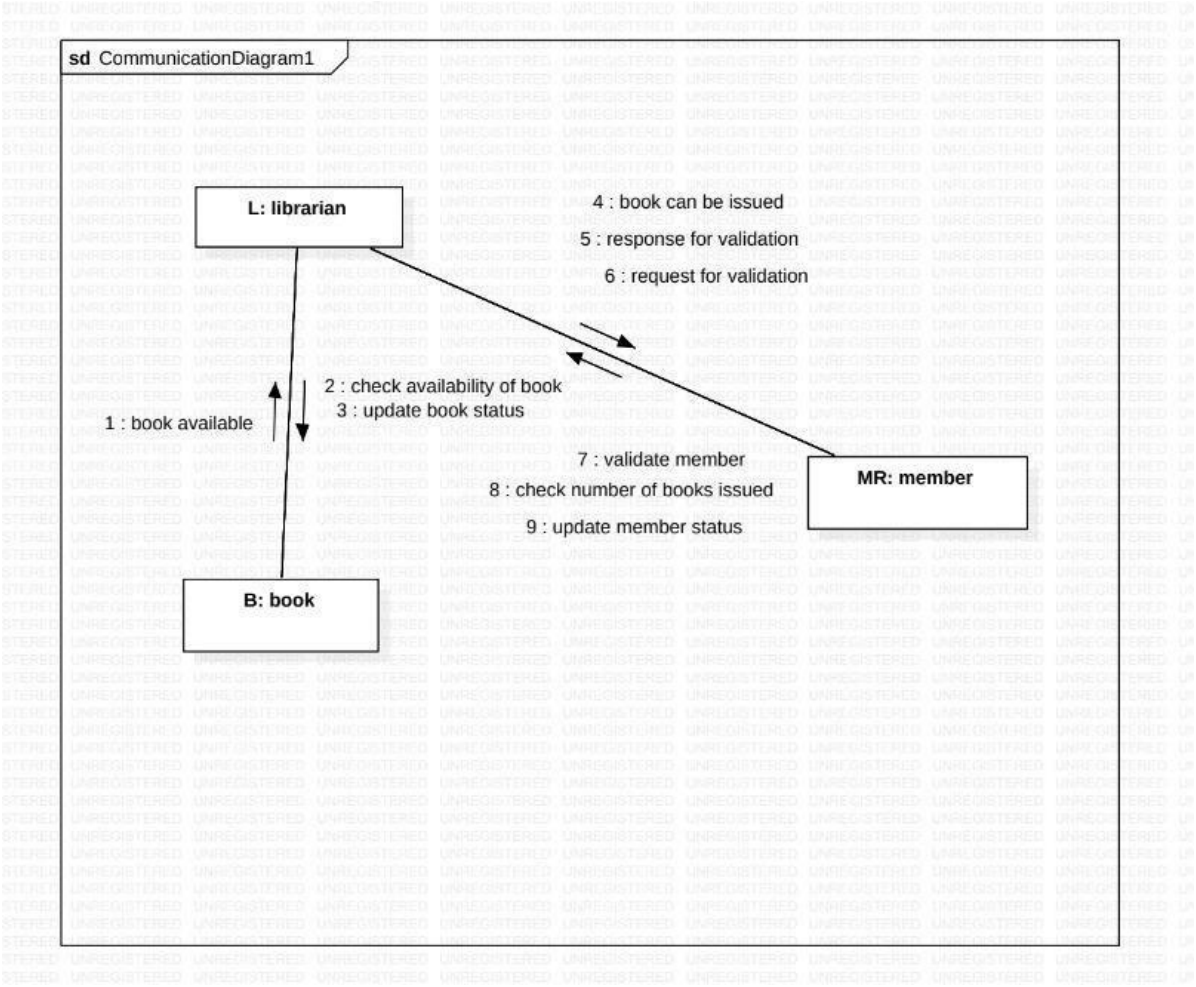
CLASS DIAGRAM:



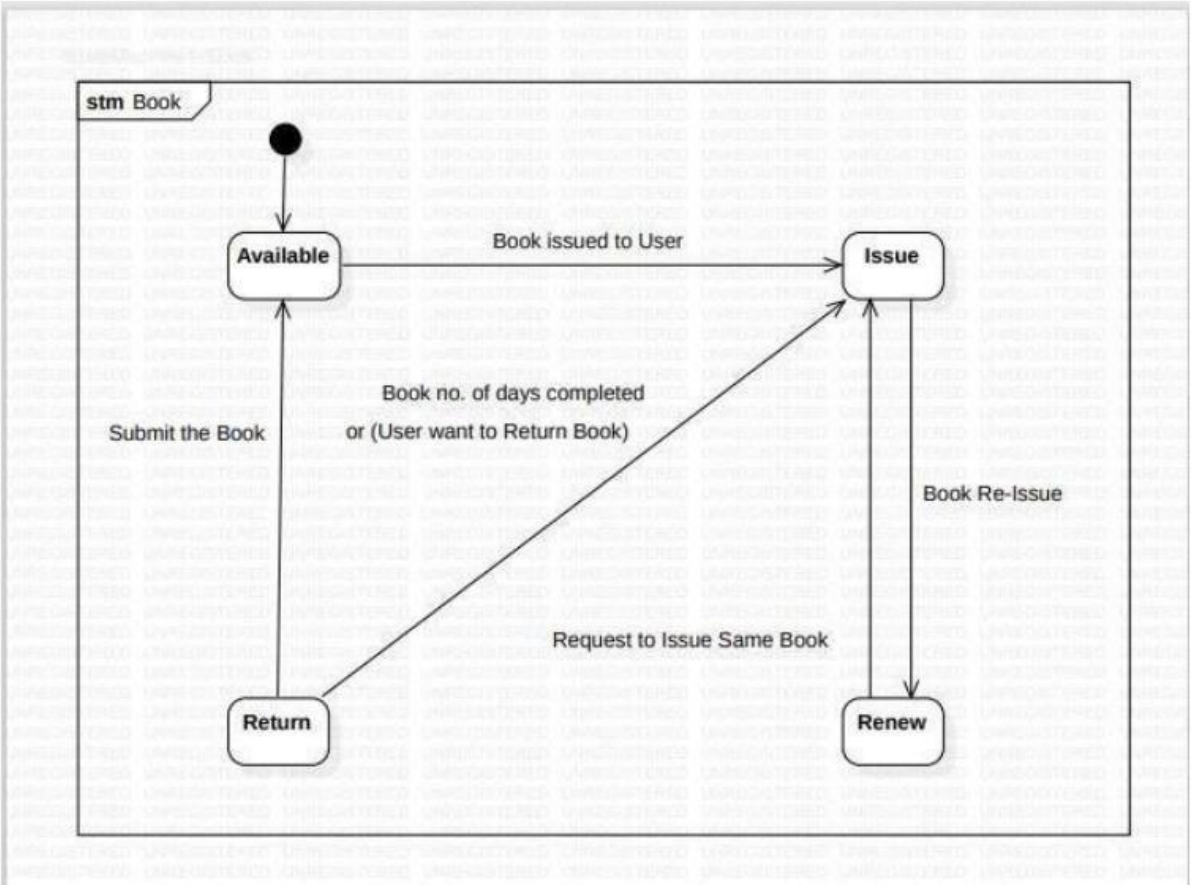
SEQUENCE DIAGRAM:



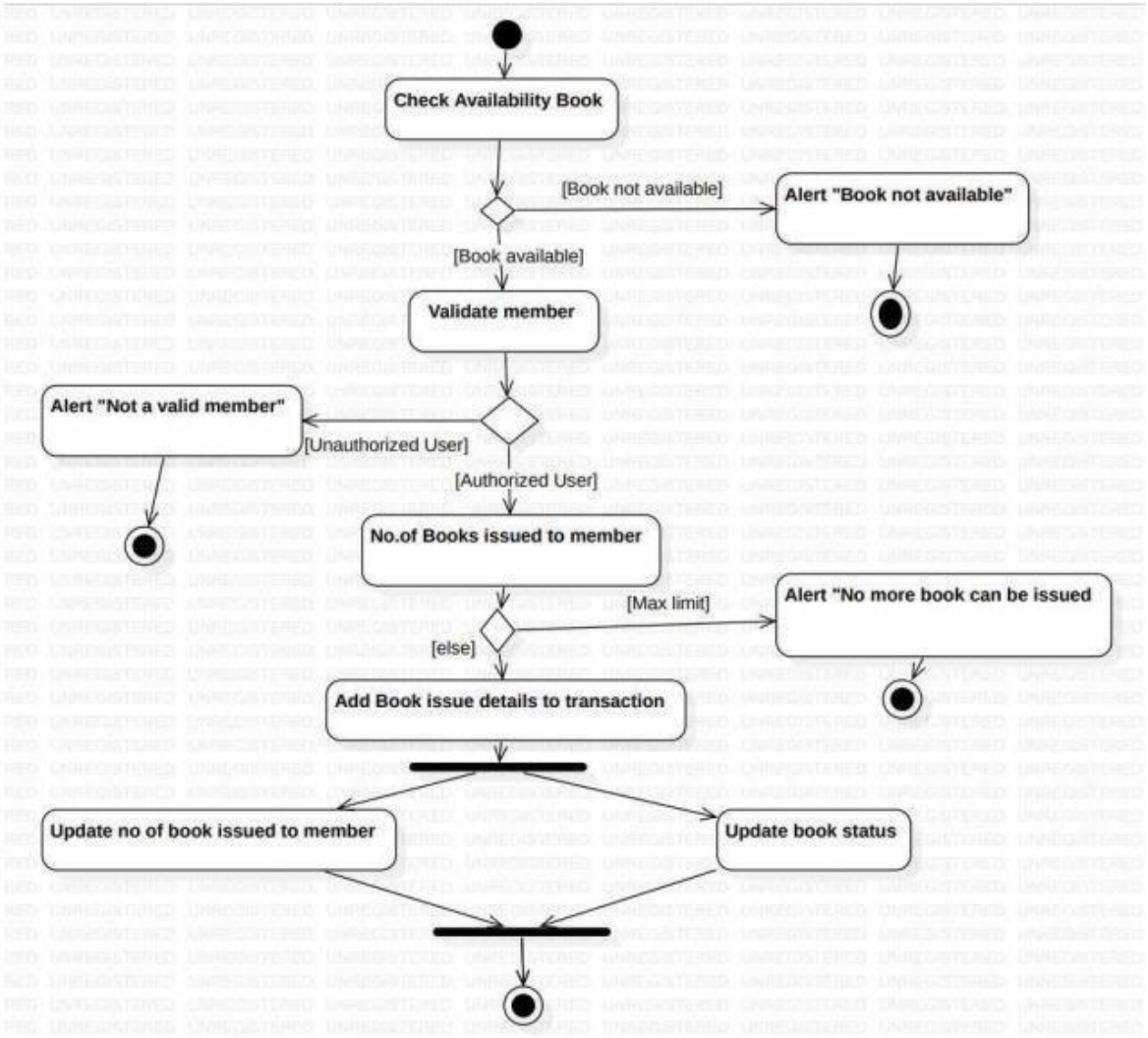
COLLABORATION DIAGRAM:



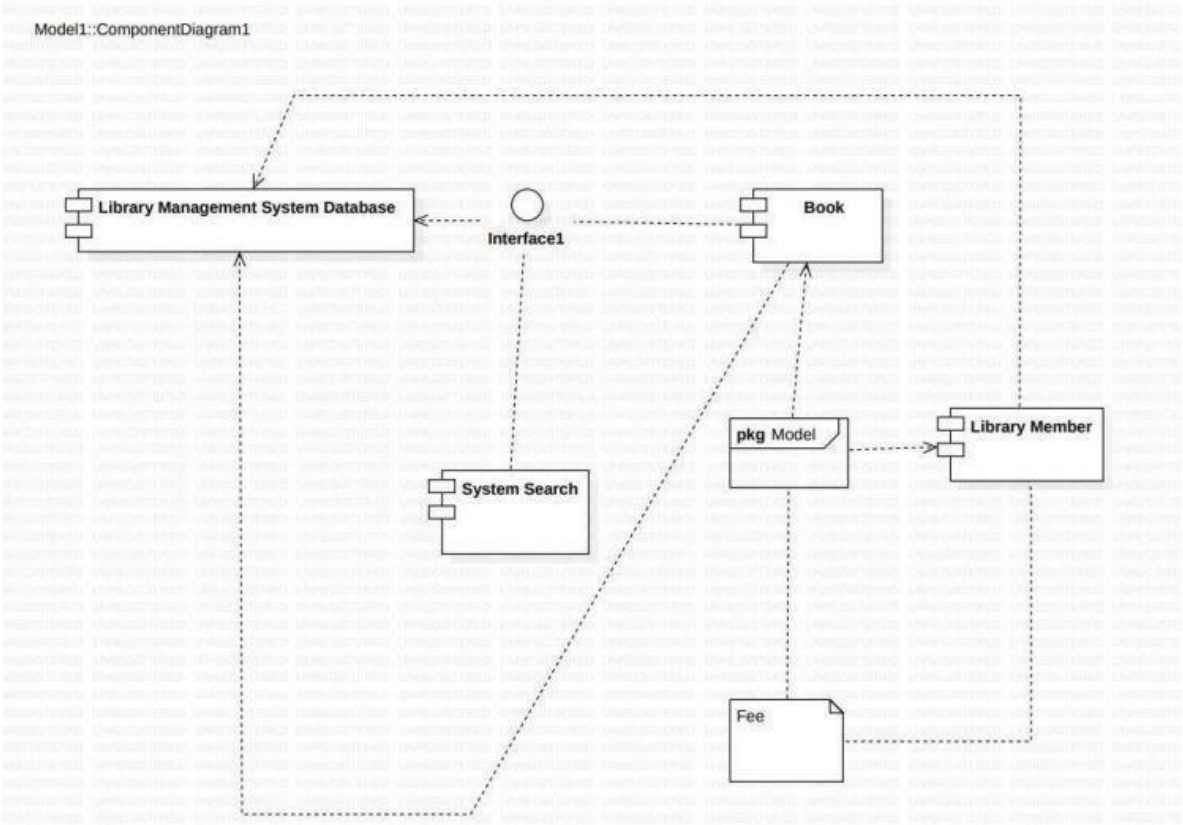
STATE CHART DIAGRAM:



VI.ACTIVITY DIAGRAM:



VI. COMPONENT DIAGRAM



6. Testcases

Test Case	Input	Expected output	Actual output
Valid Login	Username and Password	Success	Success
Invalid Login	Username and Password	Success	Failure
Ticket Booking	Select destination and choose date	Success	Success
Tickets Not Available	Select destination and choose date	Success	Failure
Payment Valid	Payment Information	Success	Success
Payment Invalid	Payment Information	Success	Failure

2
E-Ticketing System

1.Problem statement

E-ticketing is the process of booking the tickets for train/bus/flight online. E-ticketing involves the following process: the user who wants to book a ticket has to log into the website using their ID and password. if they are a new user, they need to create a new account. after logging into the website, the system displays the form in which the user is allowed to select a destination and source place. the user can also select the date. then the system displays the available trains. from that, the user can select the required one and select number of tickets, class and symbol checks for the availability. If it is available, then book the ticket by filling details about individuals such as name, age, gender, etc. then make the payment either by card or net banking. after booking the ticket, print the ticket.

2. Software Requirement Specification Document

2.1 Functional Requirements

If the entire process of 'Issue of Books or Magazines' is done in a manual manner then it

would take several months for the books or magazines to reach the applicant. Considering the fact
that the number of students for Book Bank is increasing every year, an Automated System becomes
essential to meet the demand. So this system uses several programming and database techniques to
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order to satisfy it.
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2.2 Tools and Technology Requirements

The following are the list of software requirements we are using to implement this application.

- Client Side Technologies : HTML, CSS
- Scripting Language : JavaScript
- Business Logic Development Language : JSP
- Database Connectivity : JDBC
- Database : MYSQL
- Operating System : Windows 10
- Documentation : MS-Office

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The following are the hardware requirements with minimum configuration to get better performance of our application.

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- Front end : Java 1.8
- Technologies : JSP and JDBC
- Database : MYSQL server
- Web Server : Apache Tomact 8.5

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A class diagram is a diagram that shows a set of classes, interfaces, and collaborations and their relationships.

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Class diagrams are used to model the static design view of a system. While modelling the static design view of a system, class diagrams are used in one of the three ways:

- To model the vocabulary of a system
- To model simple collaborations
- To model a logical database schema

iii. Sequence Diagrams

A sequence diagram emphasizes the time ordering of messages. Sequence diagram is formed by first placing the objects that participate in the interaction at the top of your diagram, across the X axis. Typically, you place the object that initiates the interaction at the left, and increasingly

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subordinate objects to the right. Next, you place the messages that these objects send and receive
along the Y axis, in order of increasing time from top to bottom. This gives the reader a clear visual
cue to the flow of control over time.
Sequence diagrams have two features that distinguish them from collaboration diagrams.

- First, there is the object lifeline. An object lifeline is the vertical dashed line that represents the existence of an object over a period of time.
- Second, there is the focus of control. The focus of control is a tall, thin rectangle that shows the period of time during which an object is performing an action, either directly or through a subordinate procedure.

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- Links
- Messages

Common Use:
Modeling Flows of Control by Time Ordering.

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An activity diagram shows the flow from activity to activity. An activity is an ongoing non atomic
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- Transitions
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- To model an operation

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i. Overview of Testing

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Unit testing:

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Types of testing:

White-box testing: White-box testing, sometimes called glass-box testing, is a test case design
method that uses the control structure of the procedural design to derive test cases.
These test cases

- Guarantee that all independent paths within a module have been exercised at least once
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- Errors in data structures or external data base access
- Behavior or performance errors
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- Changes in user requirement, policy, budget, schedule need to be accommodated.
- Software should able to run on various machines and Operating Systems
- Helps to develop coordination among stakeholders
- SCM process is also beneficial to control the costs involved in making changes to a system

3.4 Risk Management

Risk management assists a project team in identifying risks, assessing their impact and probability

and tracking risks throughout a software project.

Categories of risks:

- Project risks
- Technical risks
- Business risks

Risk Components:

- Performance risk
- Cost risk
- Support risk
- Schedule risk

Risk Drivers:

- Negligible
- Marginal
- Critical
- Catastrophic

Risk Table:

Risks	Category	Probability (%)	Impact
Size estimate may be significantly low	PS	60	2

Delivery deadline will be tightened	BU	50	2
Customer will change requirements	PS	80	2
Technology will not meet expectations	TE	30	1
Lack of training on tools	DE	80	3
Inexperienced staff	ST	30	2

ST- Staff size and experience risk
BU – Business risk
PS – Project size risk
TE- Technology risk
1- Catastrophic
2- Critical
3- Marginal
4- Negligible

4. Design Phase tool

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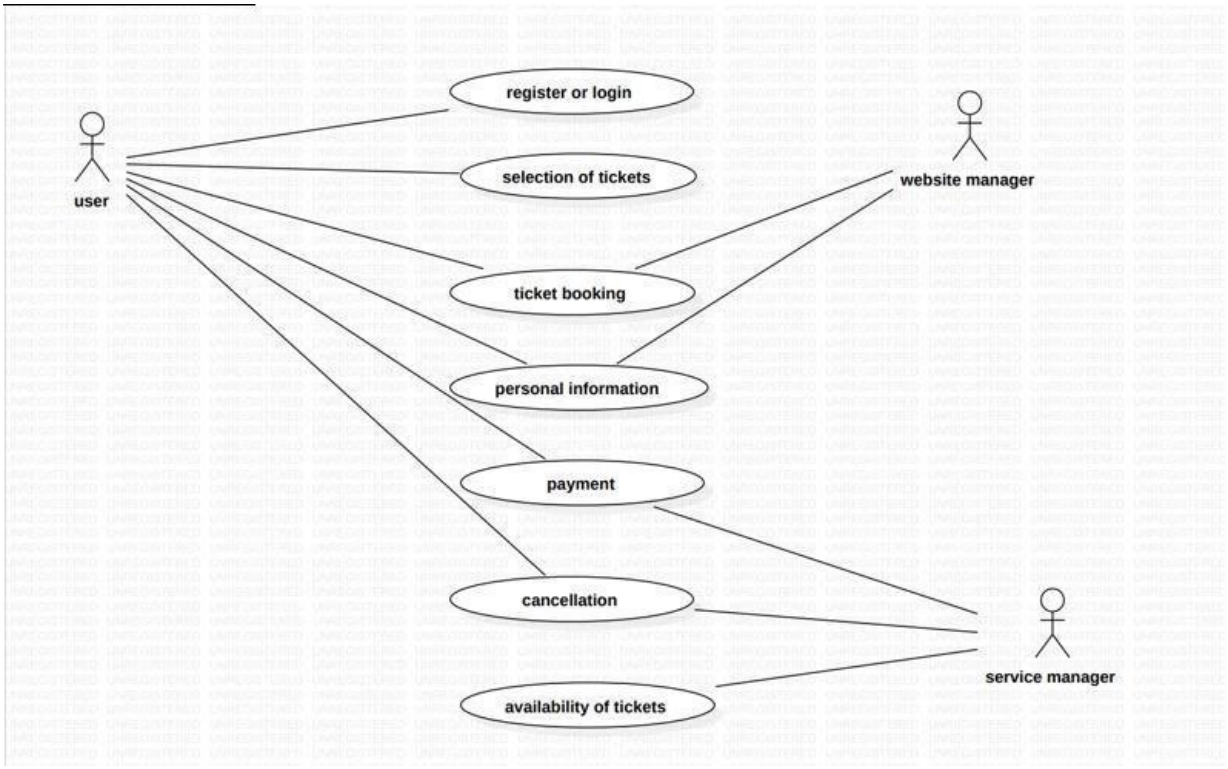
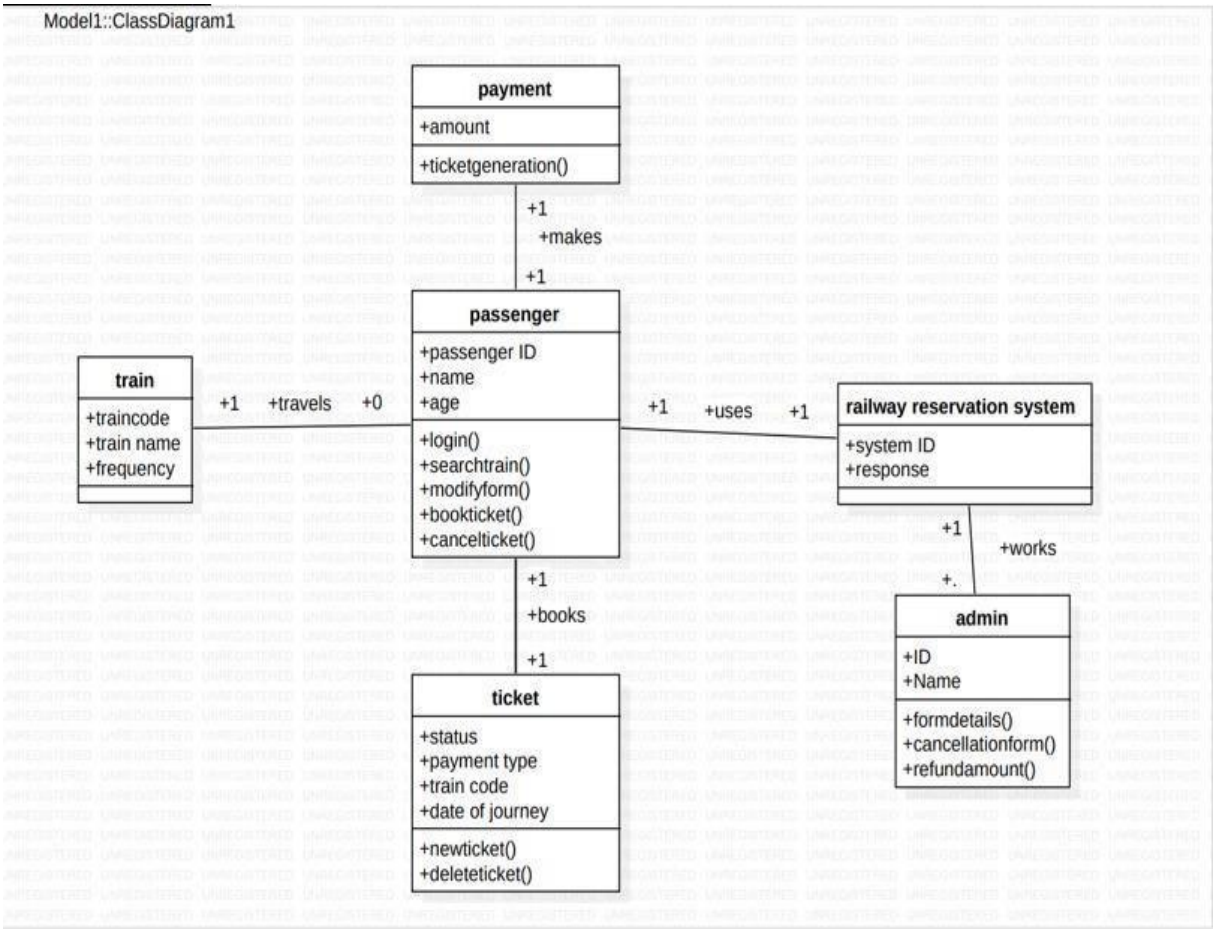
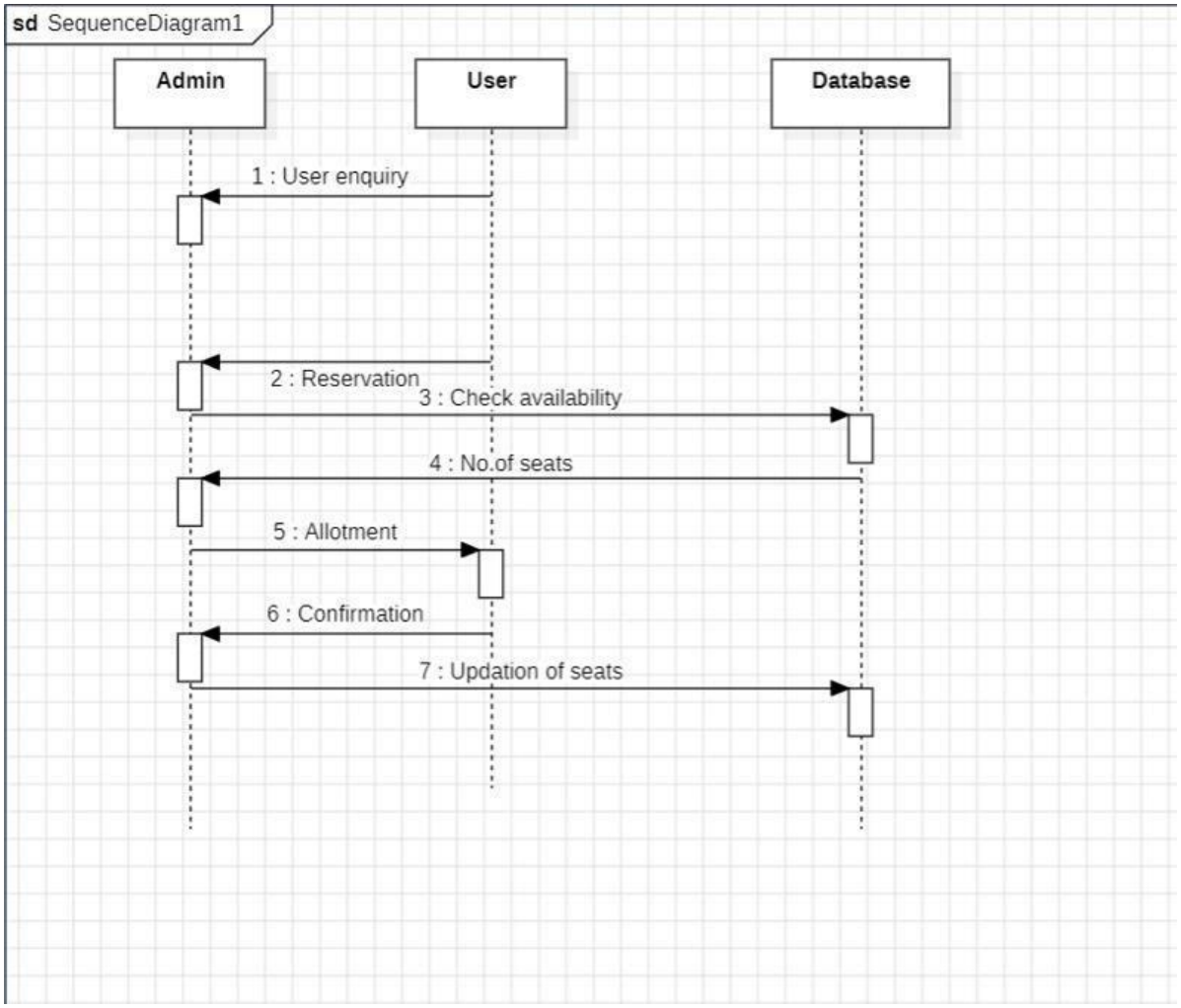
USE CASE :



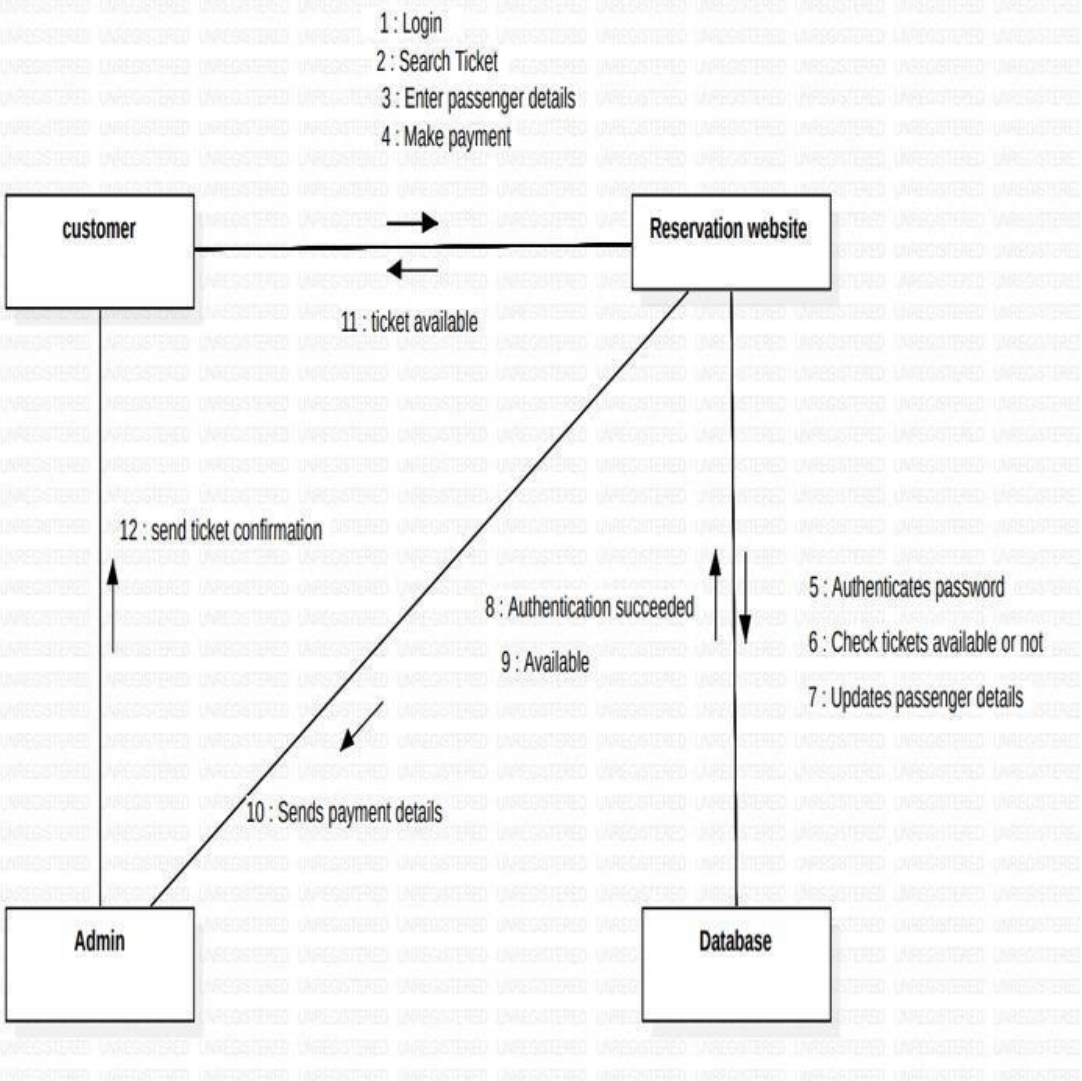
CLASS DIAGRAM:



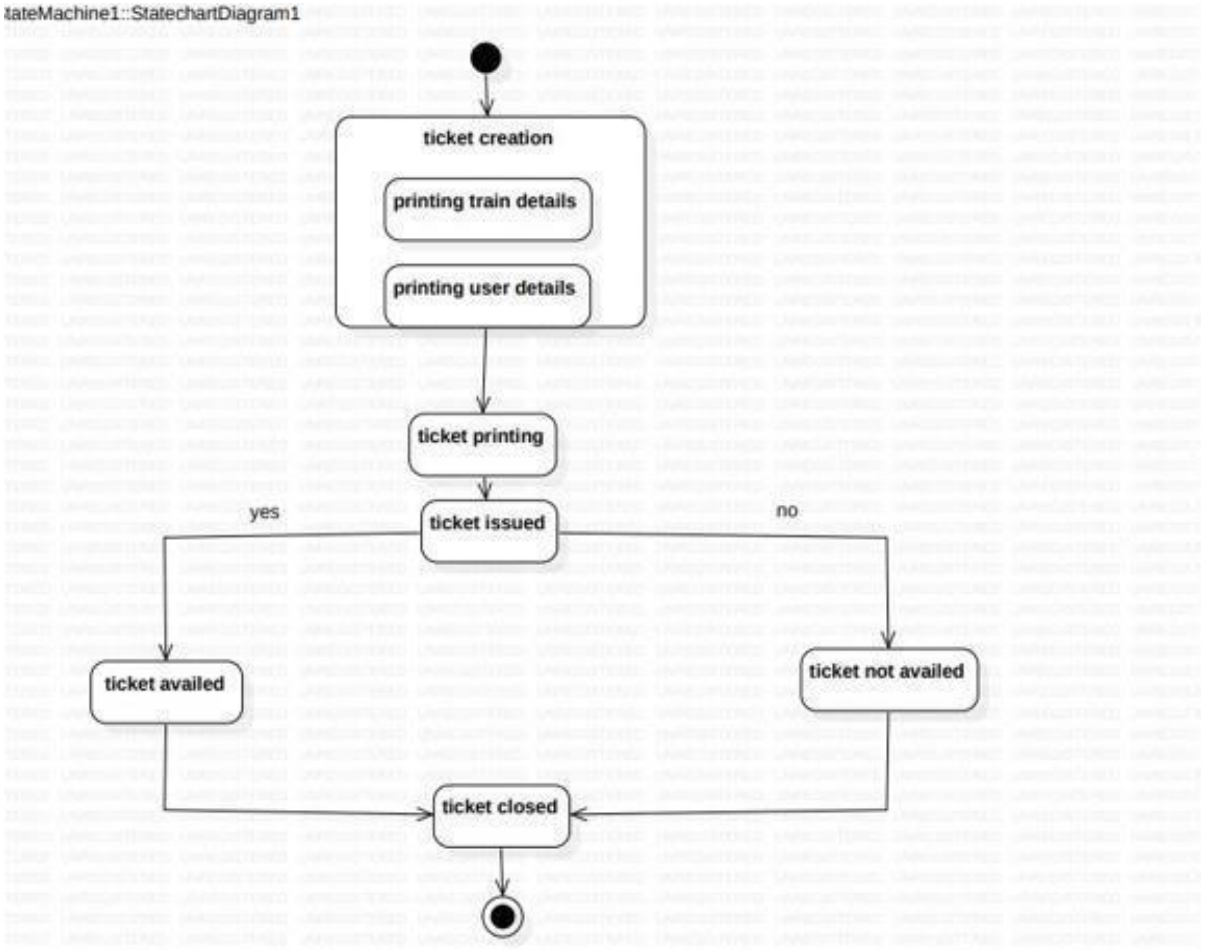
SEQUENCE DIAGRAM:


sd SequenceDiagram1
Admin
User
Database
1 : User enquiry
2 : Reservation
3 : Check availability
4 : No.of seats
5 : Allotment
6 : Confirmation
7 : Updation of seats

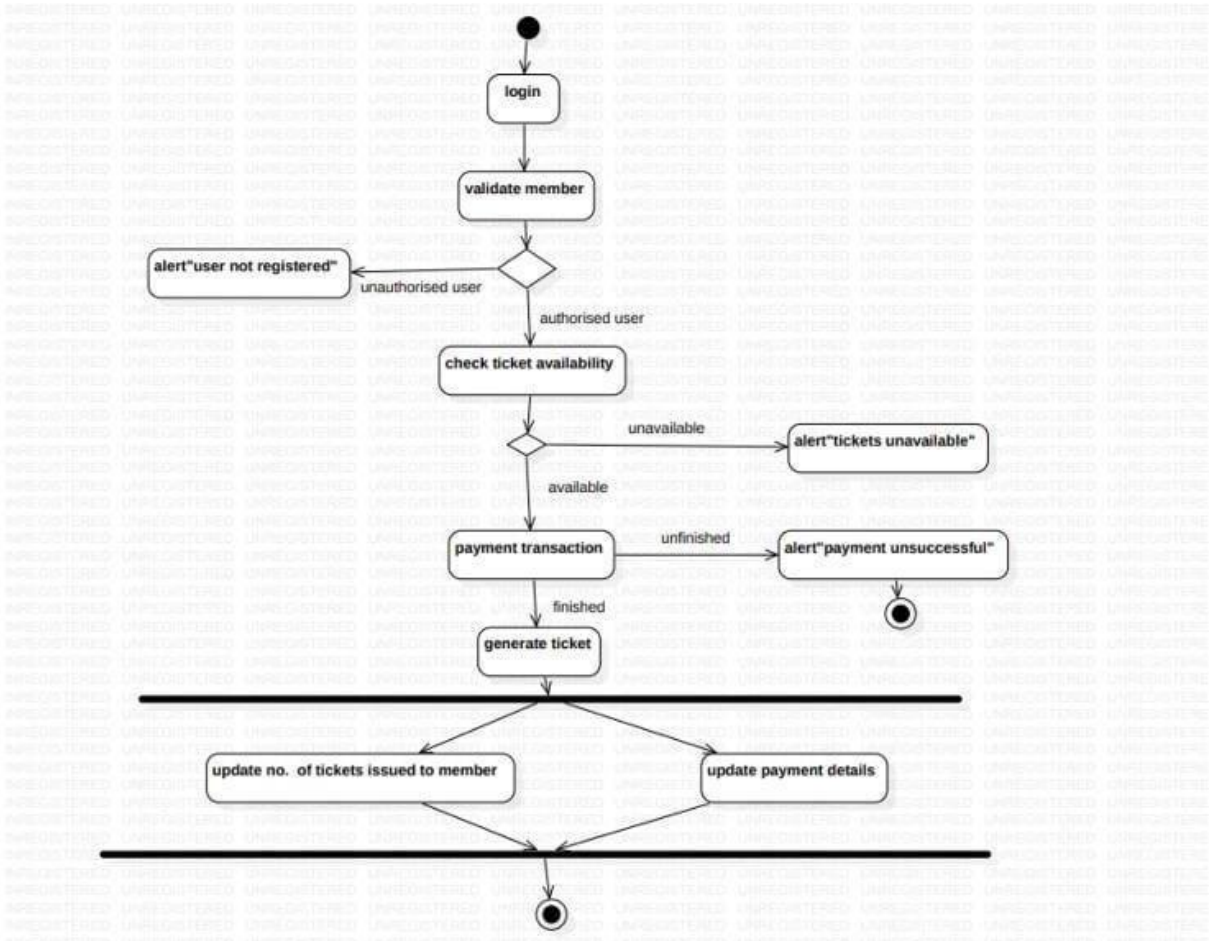
COLLABORATION DIAGRAM:



STATE CHART DIAGRAM:



ACTIVITY DIAGRAM:



6. Testcases

Test Case	Input	ExpOutput	ActOutput	Desc
Valid login	username, password, type	Success	Success	Login successful.
Invalid Login	username, password, type	Failed	Failed	Login unsuccessful. Try again.