



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)

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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.

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Submitted for the University Practical Examination held on

Internal Examiner.

External Examiner

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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 Old books and magazines are removed when they are out of date or poor in condition.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 titles, 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. 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 elucidate the work involved in this process. The system has been carefully verified and validated in order 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 Tomcat 8.5

2.3 Non-functional Requirements

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 behavior 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

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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 of time.
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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. 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.

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- Transitions
- Objects

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Activity diagrams are used to model the dynamic aspects of a system. When you model the dynamic aspects of a system, you will typically use activity diagrams in two ways.

- To model a workflow
- To model an operation

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.

vii. 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

3.1 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 test. Each test type addresses a specific testing .

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 .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 actually 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

Black box testing:

Also called behavioral 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 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 data base access
- ☒ Behavior or performance errors
- ☒ Initialization and termination errors.

3.2 Software 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 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

3.3 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

Issue	Department	Impact (Likelihood x Severity)	Priority
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

PS – Project size risk

BU – Business 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

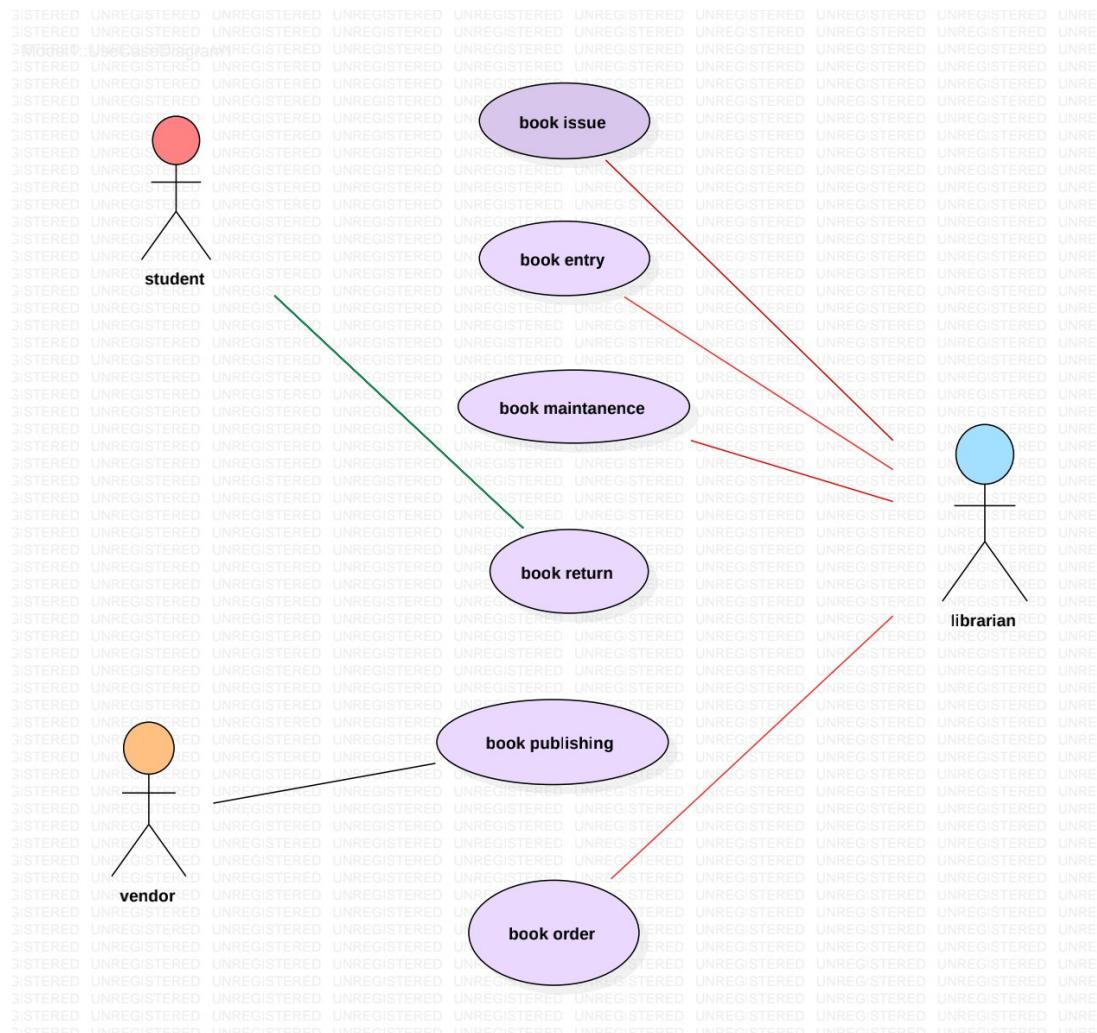
StarUML:

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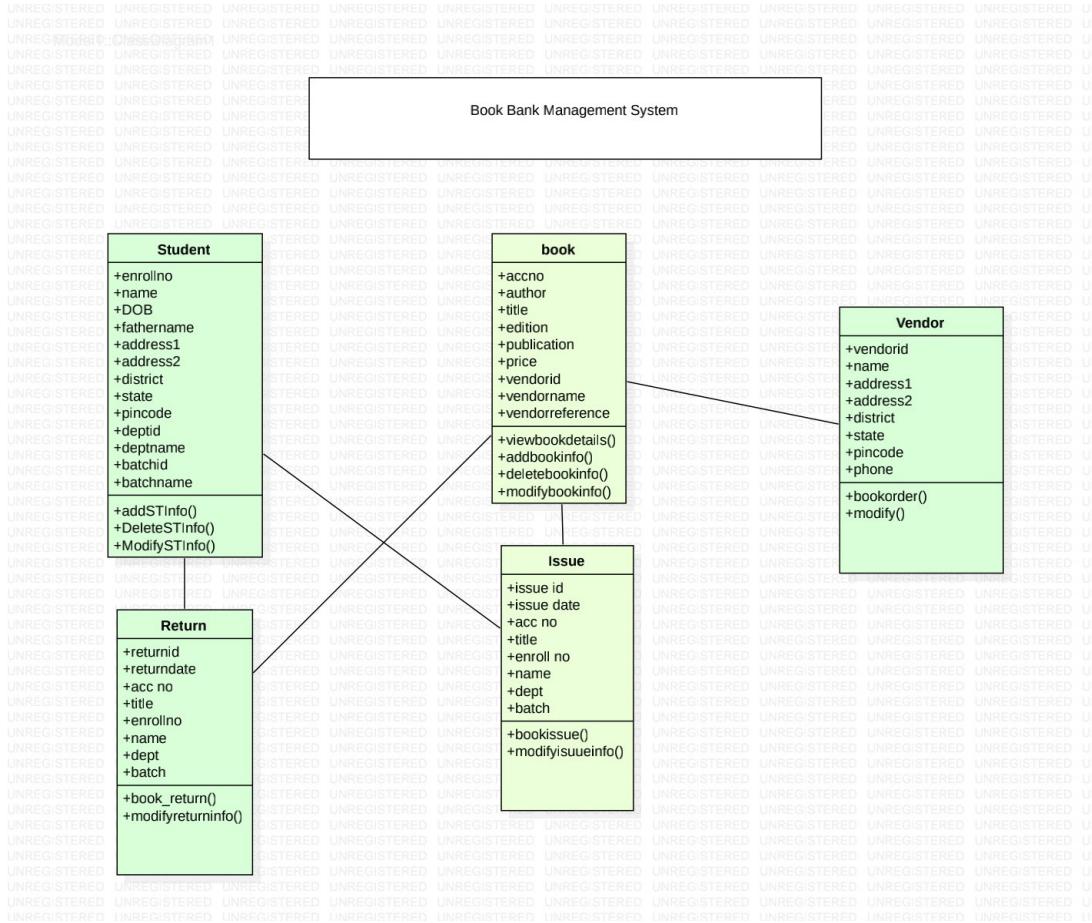
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2. Class Diagram
3. Sequence Diagram
4. Collaboration Diagram
5. Activity Diagram
6. State Chart Diagram
7. Component Diagram

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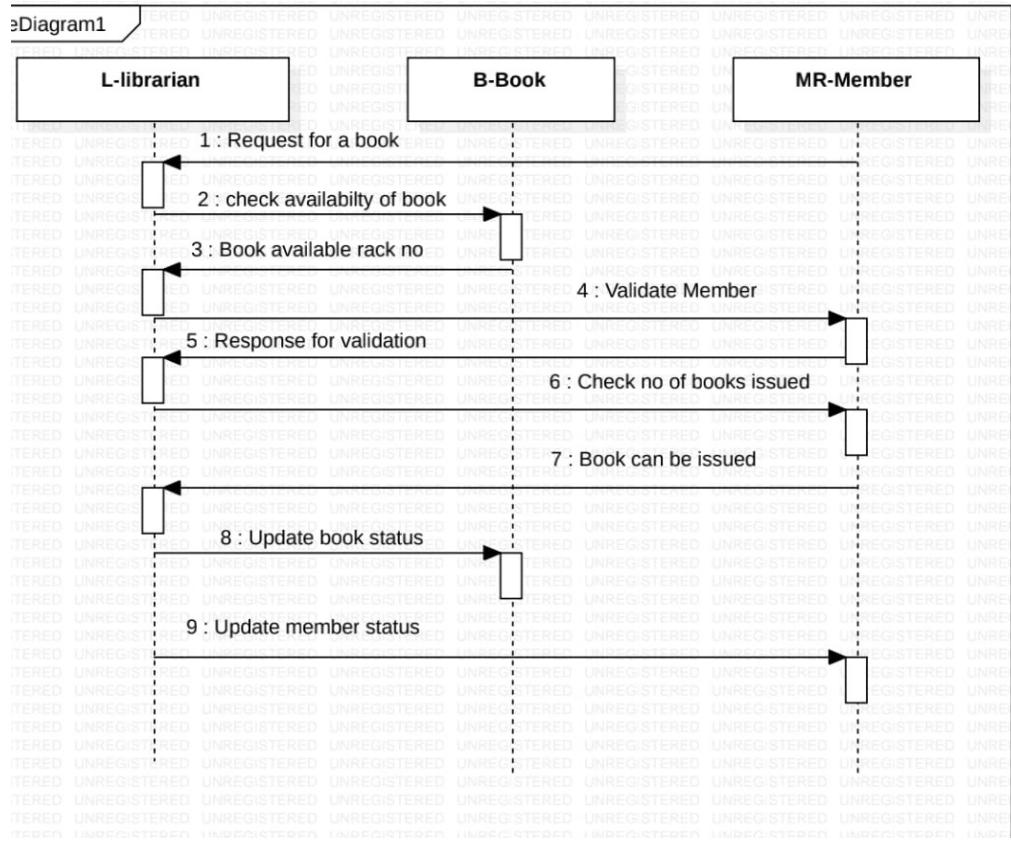
i . USECASE DAIGRAM



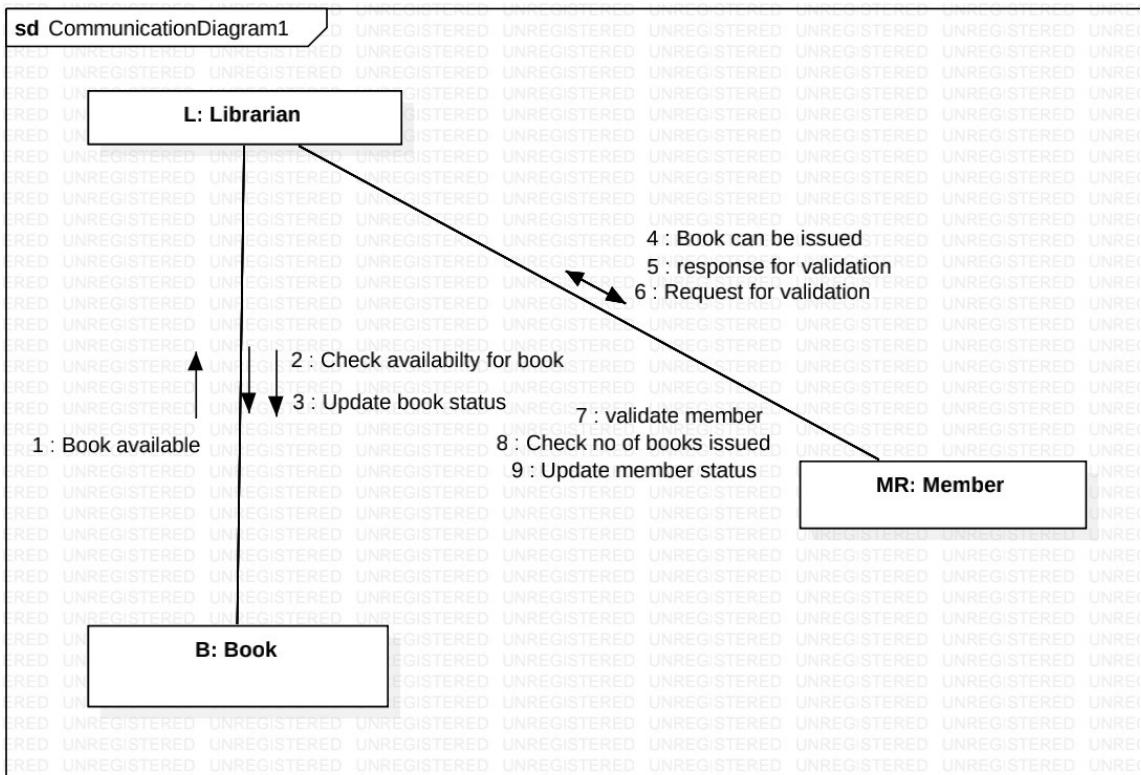
ii . CLASS DIAGRAM



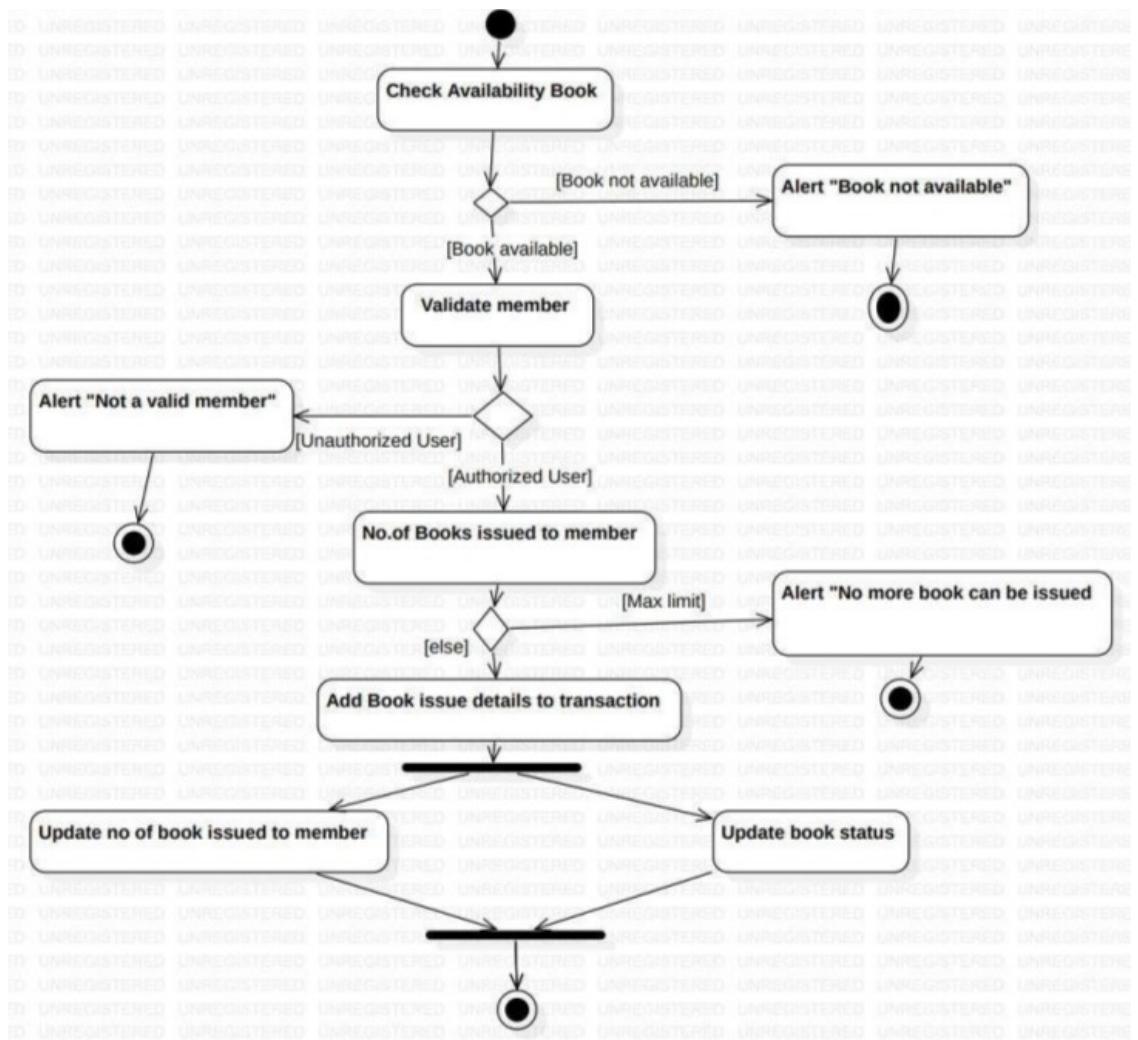
iii.SEQUENCE DIAGRAM



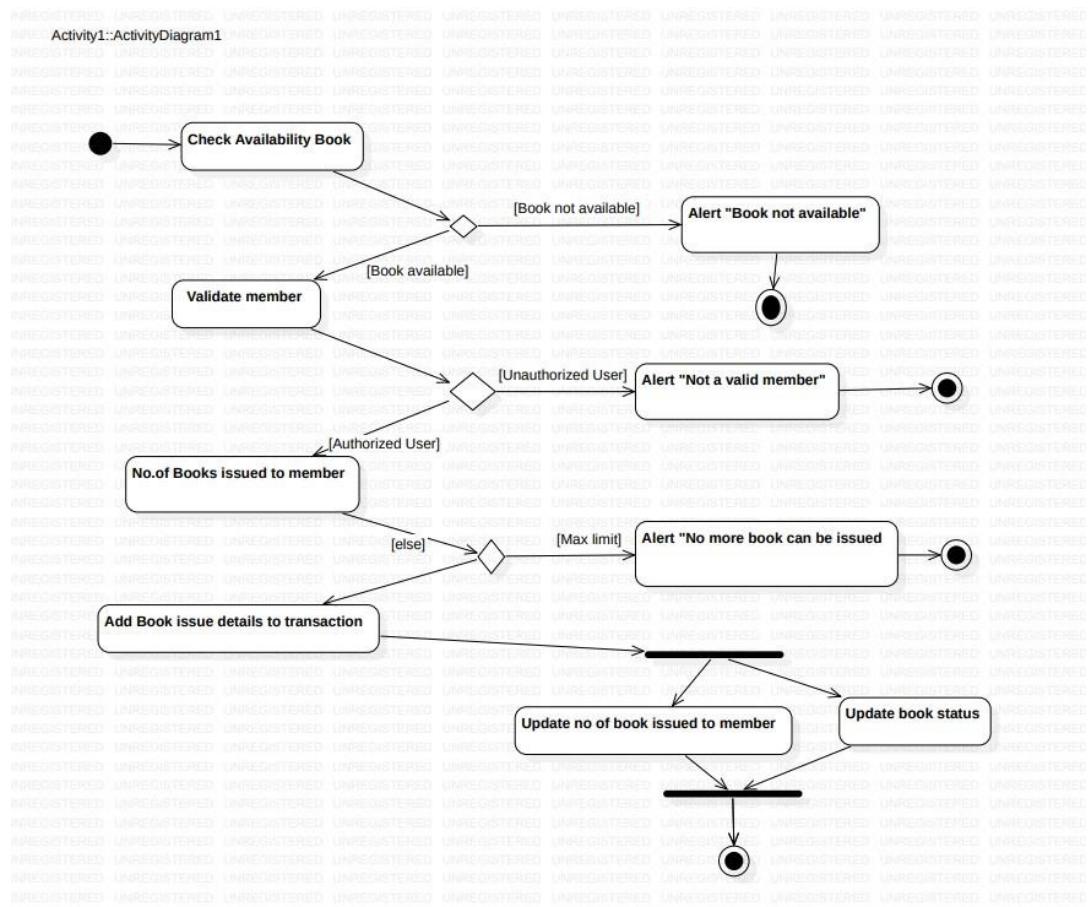
iv. COLLABARATION DIAGRAM



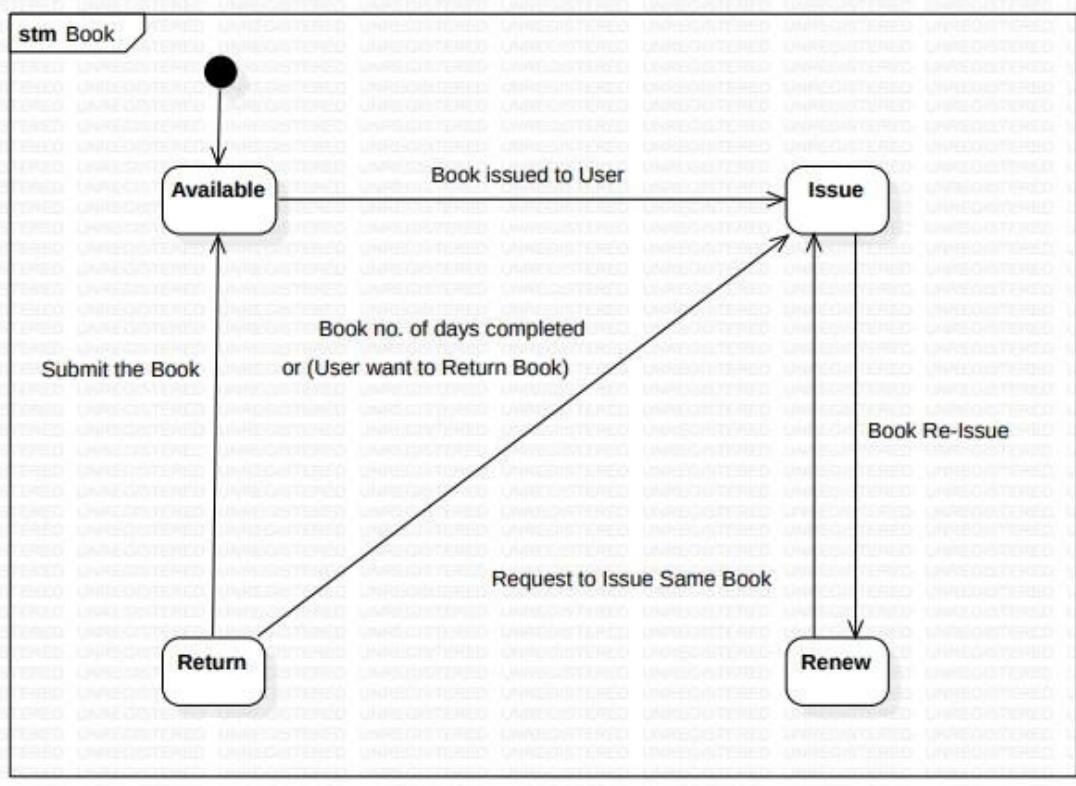
V.ACTIVITY DIAGRAM FOR BOOK ISSUE



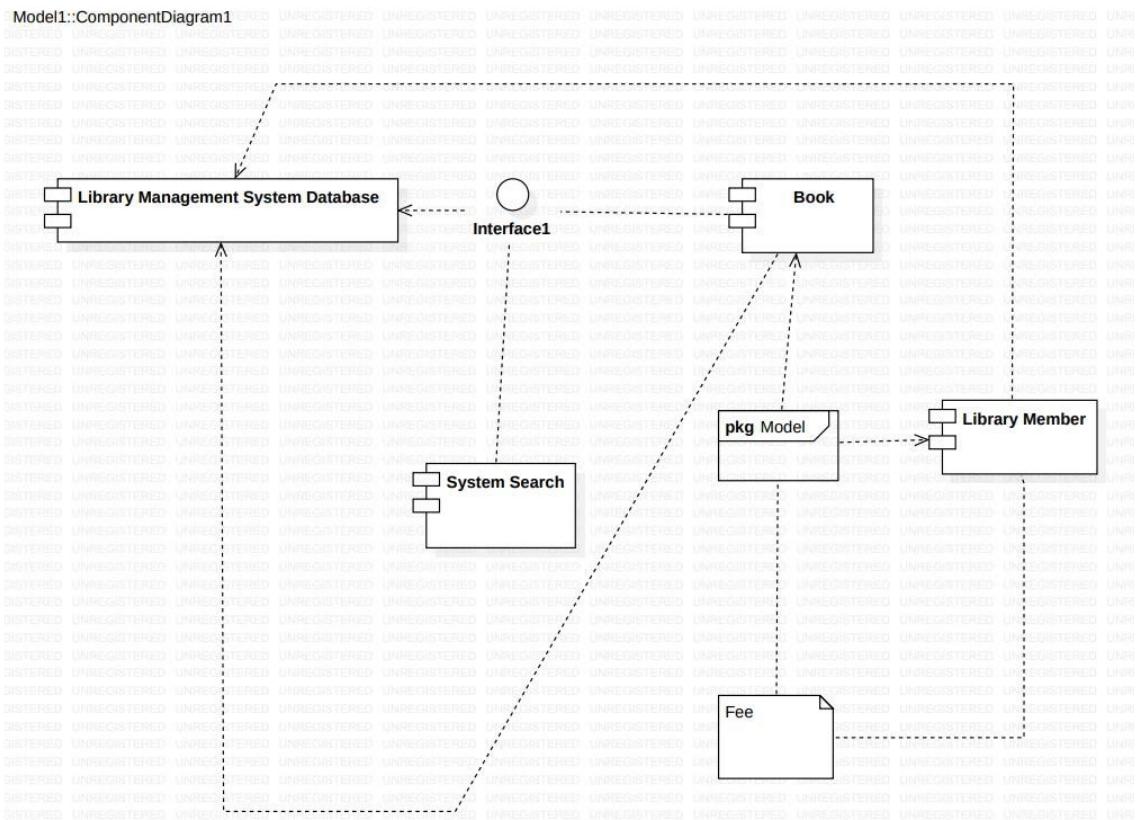
Vi.SWINLANE DIAGRAM FOR BOOK ISSUE



Vii.STATE CHART DIAGRAM



Viii.COMPONENT DIAGRAM



Test Cases :

Test Case	Input	Expected Output	Actual Output	Description
Valid login	Username, Password, Type	Success	Success	Login successful.
Invalid Login	Username, Password, Type	Failed	Failed	Login unsuccessful. Try again.

ONLINE EXAM REGISTRATION

1. Problem statement

Exam Registration System is used in the effective dispatch of registration form to all the students .This system adopts a comprehensive approach to minimize the manual work and schedule resources time in cogent manner .The application is then processed manually based on the report given by the system .The system also provides the student list of exam dates the controller will be provided with fee details to display the current status of application to the student which they can view in their online interface After all the necessary criteria has been met the original information is added to the database and the hall ticket is sent to the student.

2. Software Requirement Specification Document

2.1 Functional Requirements

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- Input and Output Devices : Keyboard, Monitor

Deployment Requirements:

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

2.3 Non-functional Requirements

Usability: Is a quality attribute used to access how easy the interface is to use. Usability is ease of use. It tells how user friendly the interface is. It includes memorability, learnability, and satisfaction. Our software interface has all the above quality. Any kind of user can easily understand the interface.

Reliability: Reliability is how much the system is consistent in different platforms. The ability of an apparatus, system to consistently perform its required function, on demand and without degradation or failure.

Integrity : Integrity means doing the right thing in a reliable way. Data integrity is a fundamental component of security. In its broadcast use, “Data Integrity” refers to the accuracy and consistency of data stored in a database, data mart or another construct. Data integrity is the overall completeness, accuracy and consistency of data.

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- ☒ Technical risks
- ☒ Business risks

Risk Components:

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- ☒ Cost risk
- ☒ Support risk
- ☒ Schedule risk

Risk Drivers:

- ☒ Negligible
- ☒ Marginal
- ☒ Critical
- ☒ Catastrophic

RISK TABLE

Risk Description	Category	Probability(%)	Impact
Inadequate server capacity for high traffic	TE	70	2
Payment gateway failure	BU	40	2
Data security breach	TE	60	1
User authentication issues	TE	50	2
Technical glitches during exams	TE	60	2
Insufficient user support	DE	50	3

- TE - Technology risk
- BU - Business risk
- DE - Delivery risk

The impact levels are rated on a scale from 1 to 4:

1: Catastrophic	3: Marginal
2: Critical	4: Negligible

RISK MANAGEMENT PLAN

RISK	TRIGGER	OWNER	RESPONSE	RESOURCE REQUIRED
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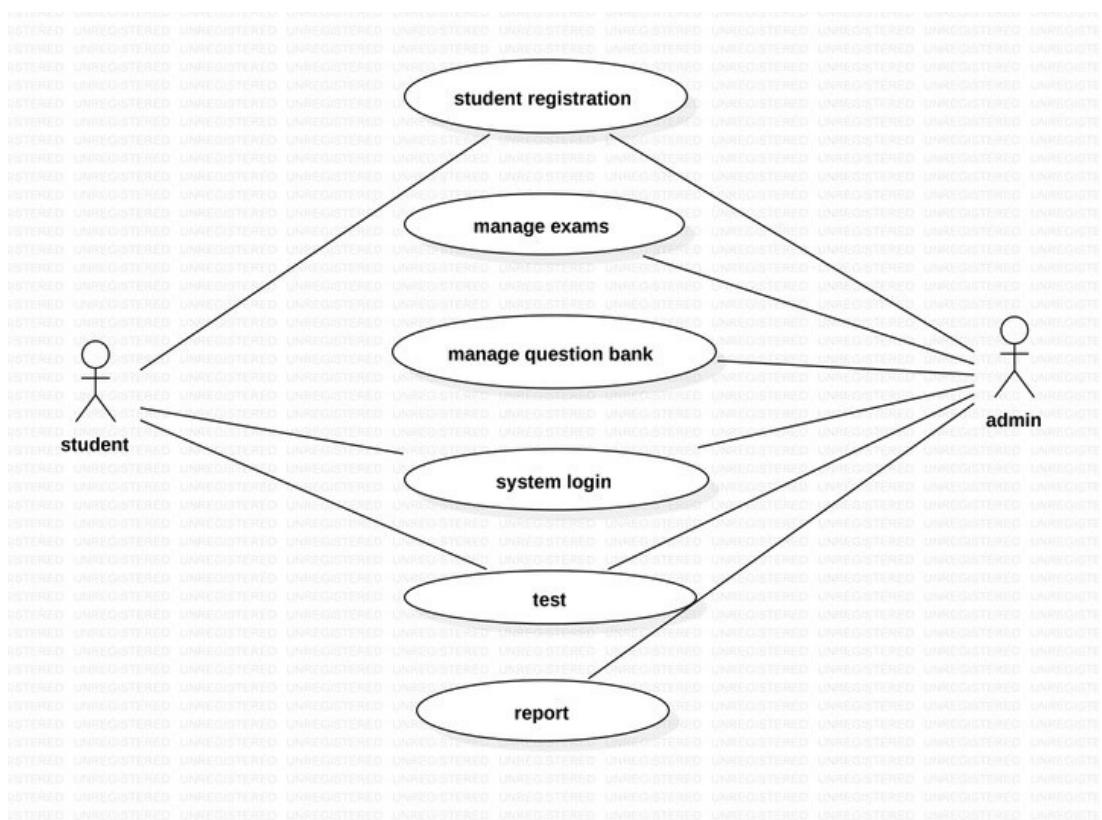
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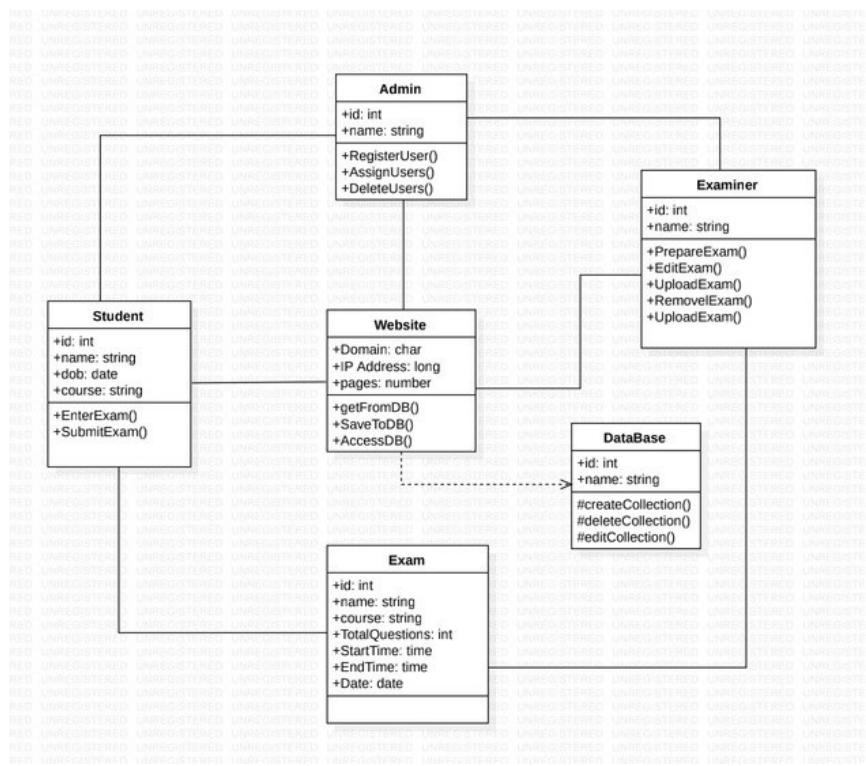
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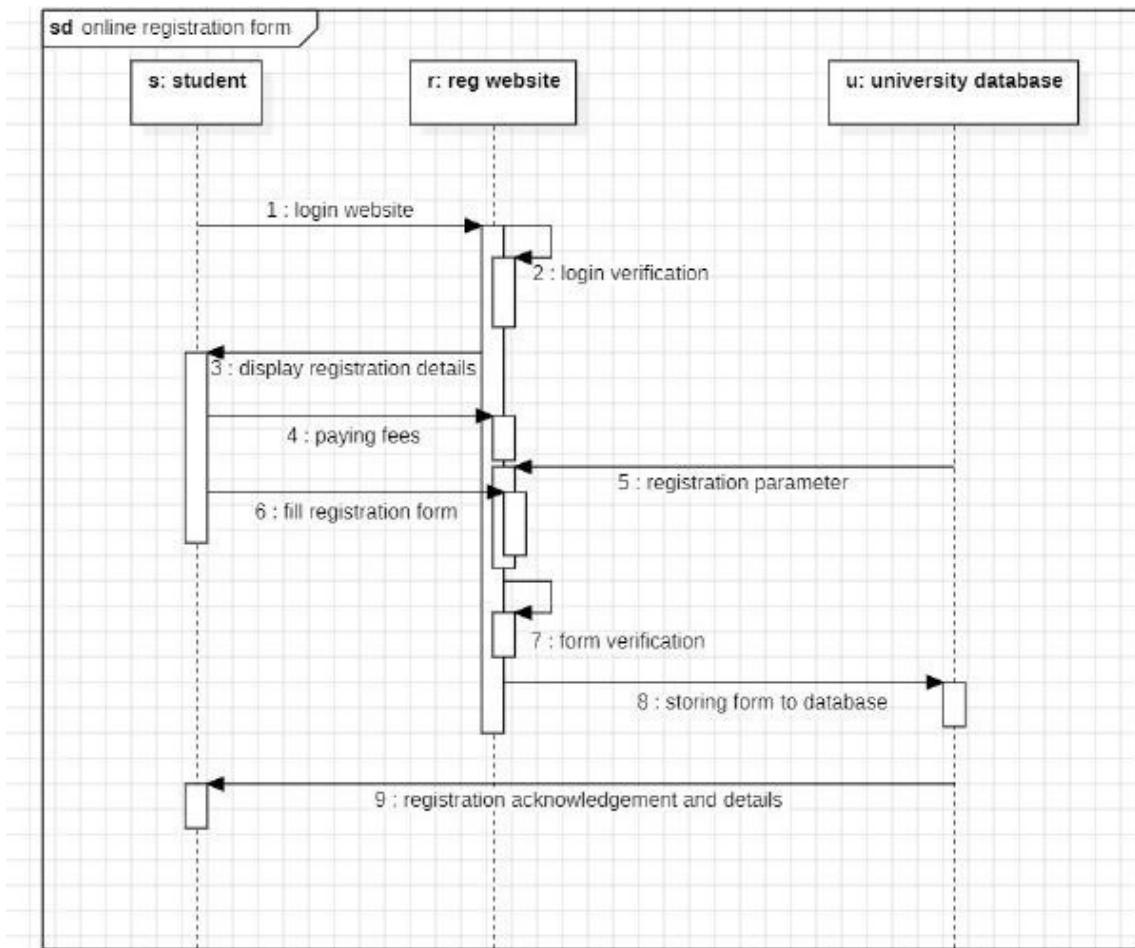
i.USECASE DIAGRAM



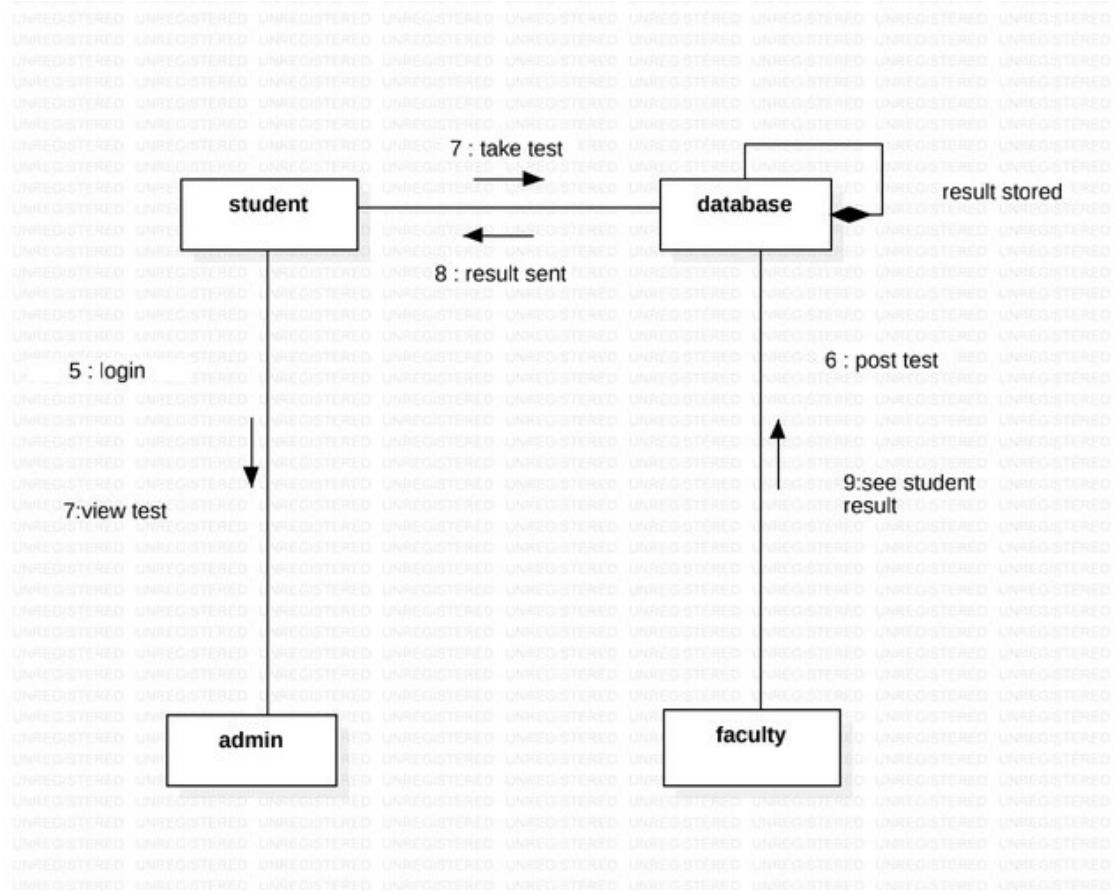
ii.CLASS DIAGRAM



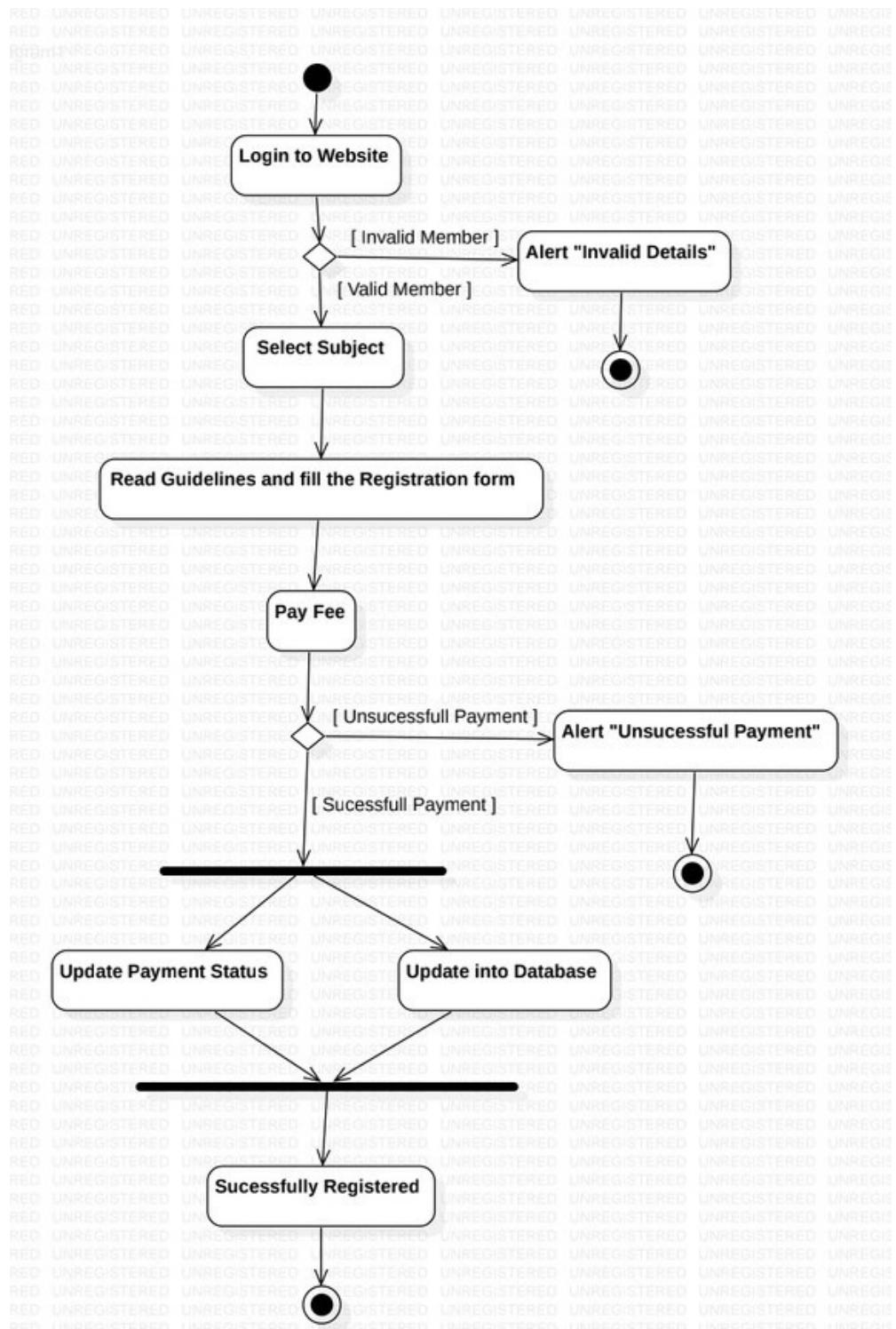
iii.SEQUENCE DIAGRAM



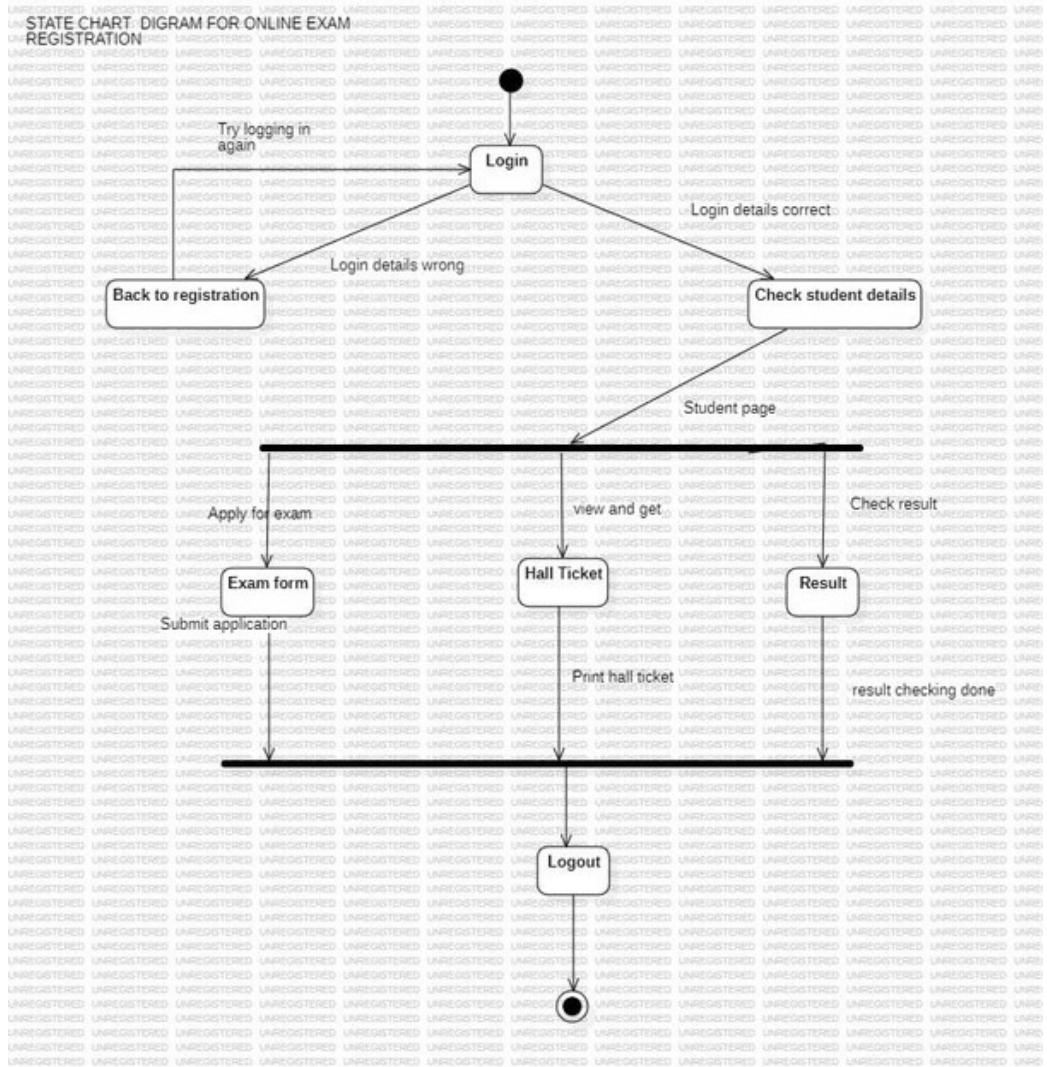
iv.COLLABORATION DIAGRAM



V.ACTIVITY DIAGRAM



Vi.STATECHART DIAGRAM



6.Test Cases:

Test Case	Input	Expected Output	Actual Output	Description
Valid Login	Username, Password, Type	Success	Success	Successful login
Invalid Login	Username, Password, Type	Failure	Failure	Unsuccessful login
Valid Fee	Account Details	Success	Success	Successful fee process
Invalid Fee	Account Details	Failure	Failure	Unsuccessful fee process