College code: 6F
PALLAVI ENGINEERING COLLEGE
(UGC AUTONOMOUS)
Accredited by NBA and NAAC with 'A' grade, Approved by AICTE, New Delhi & Affiliated to JNTUH-Hyderabad
Certified by ISO 9001 : 2015 | ISO 14001 : 2015 | ISO 50001 : 2018
Kuntloor(V), Adbullapurmet(M), Near Hayathanagar, R.R. Dist. Hyd - 501505, (T.S.) India

Department of Computer Science and Engineering (AI&ML)

SOFTWARE ENGINEERING
LAB MANUAL

Regulation
PR24

Class: II B.Tech I Semester

Prepared by

Y.SOWJANYA

Assistant Professor

LAB FACULTY **HOD** **PRINCIPAL**

VISION OF THE INSTITUTE

- To emerge as a global leader in imparting quality technical education emphasizing ethical values for the betterment of the society.

MISSION OF THE INSTITUTE

- To create an excellent teaching learning environment and inculcate the aptitude for research.
- To establish centers of excellence through collaborative initiatives.
- To empower the student community by developing creativity and innovation.

Proposed Vision and Mission of the Department

VISION OF THE DEPARTMENT

- To become a leading centre of excellence in Artificial Intelligence and Machine Learning by fostering innovation, research, and collaboration in diverse areas of computer science. We aim to address global challenges and emerging societal needs through advanced education, cutting-edge technologies, and impactful solutions in AI and ML.

MISSION OF THE DEPARTMENT

- To equip students with the knowledge and skills to solve complex, real-world problems in multidisciplinary fields using AI and ML technologies.
- To foster strong domain expertise and research capabilities, enabling students to pursue challenging careers and advanced education in AI and ML.
- To provide students with a strong sense of ethics, professionalism, and a desire for lifelong learning, enabling them to make significant contributions to both the field and society.

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

The Computer Science and Engineering – Artificial Intelligence and Machine Learning graduate will:

PEO	Statements
PEO1	Graduates will be prepared for a successful career in Computer Science discipline and related industry to meet the needs of the nation and leading industries and also to excel in postgraduate programs.
PEO2	Graduates will continue to learn and apply the acquired knowledge to solve Engineering problems and appreciation of the arts, humanities and social sciences.
PEO3	Graduates will have good and broad scientific and engineering knowledgebase so as to comprehend, analyze, design and create novel products and solutions for real-time applications.
PEO4	Graduates will understand professional and ethical responsibility, develop leadership, utilize membership opportunities, and develop effective communication skills, teamwork skills, multidisciplinary approach and life-long learning required for a successful professional career.

PROGRAM SPECIFIC OUTCOMES (PSOs)

The Computer Science and Engineering – Artificial Intelligence and Machine Learning graduate will be able to:

PSOs	Statements
PSO1	Expertise in different aspects and appropriate models of Data Science and use large data sets to cater for the growing demand for data scientists and engineers in industry.
PSO2	Apply the principles and techniques of database design, administration, and implementation to enhance data collection capabilities and decision-support systems.

Program outcomes:

1. Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

2. Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

3. Design / Development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

4. Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

5. Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

6. The Engineer and Society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

7. Environment and Sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

8. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

9. Individual and Team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

10. Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

11. **Project Management and Finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest.

DEPARTMENT OF CSE (AI&ML)

Sub. Code : **Year / Sem : II-I**

Sub. Name :SOFTWARE ENGINEERING LAB **Batch: 2023-2027**

Course Objectives:

The learning objectives of this course are to

To have hands on experience in developing a software project by using various software engineering principles and methods in each of the phases of software development.

Course Outcomes:

Upon completion of the course, the students will be able to

Cos	Course Outcomes (CO)
CO.1	Ability to translate end-user requirements into system and software requirements
CO.2	Ability to generate a high-level design of the system from the software requirements
CO.3	Will have experience and/or awareness of testing problems and will be able to develop a simple testing report
CO.4	To have hands on experience in developing a software project by using various software engineering principles and methods in each of the phases of Software development

List of Experiments

Do the following 8 exercises for any two projects given in the list of sample projects or any otherprojects:

1) Development of problem statement.
2) Preparation of Software Requirement Specification Document, Design Documents and TestingPhase related documents.
3) Preparation of Software Configuration Management and Risk Management related documents.
4) Study and usage of any Design phase CASE tool
5) Performing the Design by using any Design phase CASE tools.
6) Develop test cases for unit testing and integration testing
7) Develop test cases for various white box and black box testing techniques.

S. No	List of Experiments	Page No.
1	Passport automation System	
2	Book Bank	
3	Online Exam Registration	
4	Stock Maintenance System	
5	Online course reservation system	
6	E-ticketing	
7	Software Personnel Management System	
8	Credit Card Processing	
9	E-book management System	
10	Recruitment system	

FACULTY **HOD, CSE**

EXPERIMENT 1

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. Preparation of Software Requirement Specification Document:

Users Characteristics:

Student: They are the people who desire to obtain the books and submit the information to the database.

Librarian: He has the certain privileges to add the books and to approval of the reservation of books.

System Modules:

Log in: Secure registration of student and librarian by filling online registration form.

Book bank: Book bank contains all the books. New book added to the book bank with bookno, title name, author, edition, publisher name details to the database. Any book is deleted if damaged. Update of the book information also done.

Operations: student and administrator perform their operations like add book, delete book, update information, view book details are implemented in log in WebPages.

Non-functional requirements:

Privacy: privacy maintained for each and every user by providing user credentials username and password.

Portability: installation on multiple platforms and execution of software.

3.Preparation of Software Configuration Management

Software Requirements:

Operating sytem: windows 7/10

Front end : J2EE

Back end : My SQL Server

IDE used : Netbeans

Hardware Requirements:

Processor:i3 or higher

RAM : 4 GB

Hard Disk drive: 500 GB

1. Study and usage of any Design phase CASE tool

CASE Tool: STARUML

How to Install StarUML on Windows 10

Star UML is a UML (**Unified Modeling Language**) tool, introduce by MKLab. It is an open-source modeling tool that supports the UML framework for system and software modeling. StarUML is based on UML version 1.4, it provides 11 different types of diagram and it accepts UML 2.0 notation. Version 2.0 was released for beta testing under a property license.

StarUML is actively supporting the **MDA (Model Driven Architecture).** It approaches by supporting the UML profile concept and allowing it to generate code for multiple languages. It also provides a number of bug fixes and improved compatibility with the modern versions of the Windows Operating System.

StarUML is mostly used by the Agile and small development teams, professional persons and used by the educational institutes

Diagram Types in StarUML

1. Use Case Diagram

2.Class Diagram

3.Sequence Diagram

4.Collaboration Diagram

5.Statechart Diagram

6.Component Diagram

7.Deployment Diagram

8. Composite Structure Diagram

Features of StarUML

1. It supports multi-platform such as macOS, Windows, and Linux.
2. It involves UML 2.x.standard compliant.
3. Includes Entity-Relationship diagram (ERD), Data-flow diagram (DFD), and Flowchart diagram.
4. It creates multiple windows.
5. It has modern UX and dark and light themes.
6. Featured with retina (High-DPI) display support.
7. Includes model-driven development.
8. It has open APIs.
9. Supports various third-party extensions.
10. Asynchronous model validation.

11. It can export to HTML docs.

Steps to Download and Install StarUML

Step 1: Go on the browser, type in the URL "StarUML"

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CASE Tool: StarUML

Use_Case Diagram:

The book bank use cases are:

1. book_issue
2. book_return
3. book_order
4. book_entry
5. search book_details

Actors Involved:

1. Student

2. Librarian

3. Vendor

Usecase Name : Search Book_Details

The librarian initiates this use case when any member returns or request the book and checking if the book is available.

Precondition: The librarian should enter all Book details.

Normal Flow: Build message for librarian who search the book.

Post Condition: Send message to respective member who reserved the book.

Usecase Name : Book_ Issue

Initiated by librarian when any member wants to borrow the desired book. If the book is available, the book is issued.

Precondition: Member should be valid member of library.

Normal Flow: Selected book will be issued to the member.

Alternative Flow: If book is not available then reserved book use case should be initiate. **Post Condition:** Update the catalogue.

Usecase Name : Book_Order

Initiated by librarian when the requested book is not available in the library at that moment. The book is reserved for the future and issued to the person when it is available.

Precondition: Initiated only when book is not available.

Normal Flow: It reserved the book if requested.

Post Condition : Mention the entry in catalogue for reservation.

Usecase Name : Book_Return

Invoked by the librarian when a member returns the book.

Precondition: Member should be valid member of library.

Normal Flow: Librarian enters bookid and system checks for return date of the book. **Alternative**

\

Post Condition: Check the status of reservation.

Usecase Name : Book_Entry

The purchase book use-case when new books invoke it or magazines are added to the library.

Precondition: Not available or more copies are required.

Normal Flow: Enter bookid,author information, publication information, purchased date, prize and number of copies.

Post Condition: Update the information in catalogue.

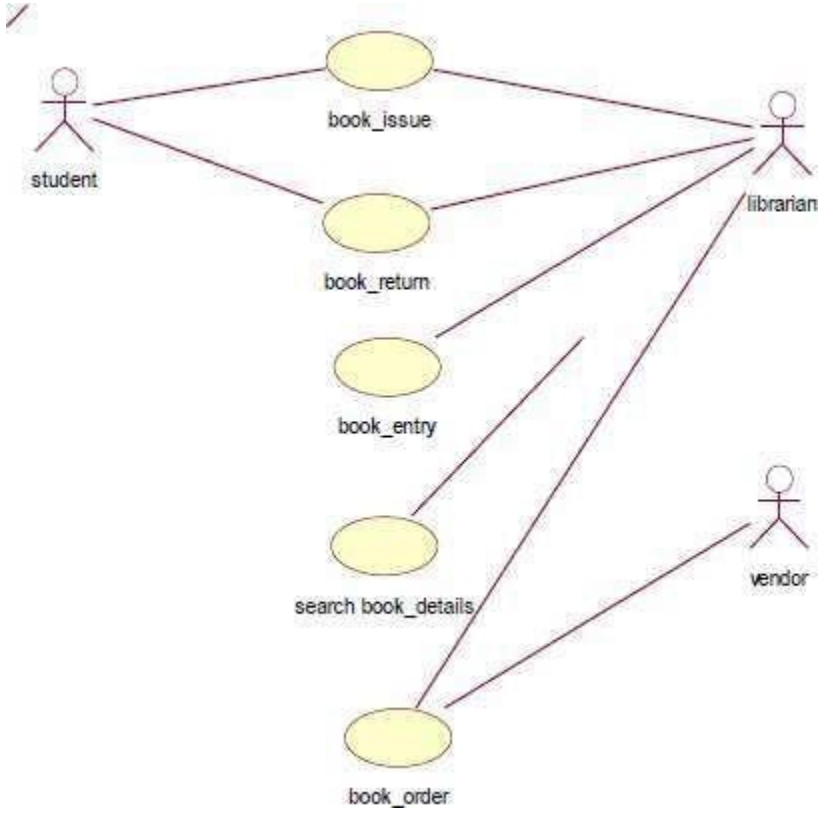

Figure 1. Usecase diagram for Book Bank System

Activity Diagram:

Activity diagrams are graphical representations of workflows of stepwise activities and actions with

support for choice, iteration and concurrency. In the Unified Modeling Language, activity diagrams can be used to describe the business and operational step-by-step workflows of components in a

system. An activity diagram shows the overall flow of control. An activity is shown as an rounded box containing the name of the operation.

This activity diagram describes the behaviour of the system.

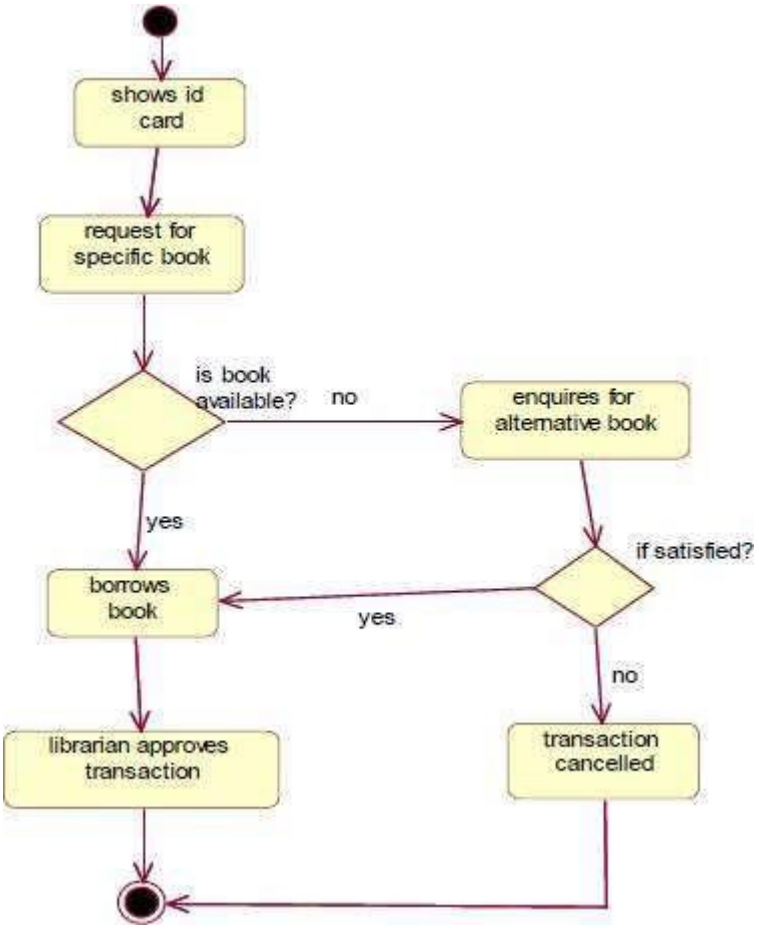

Figure 2. Activity Diagram for Book Bank System [borrow book]

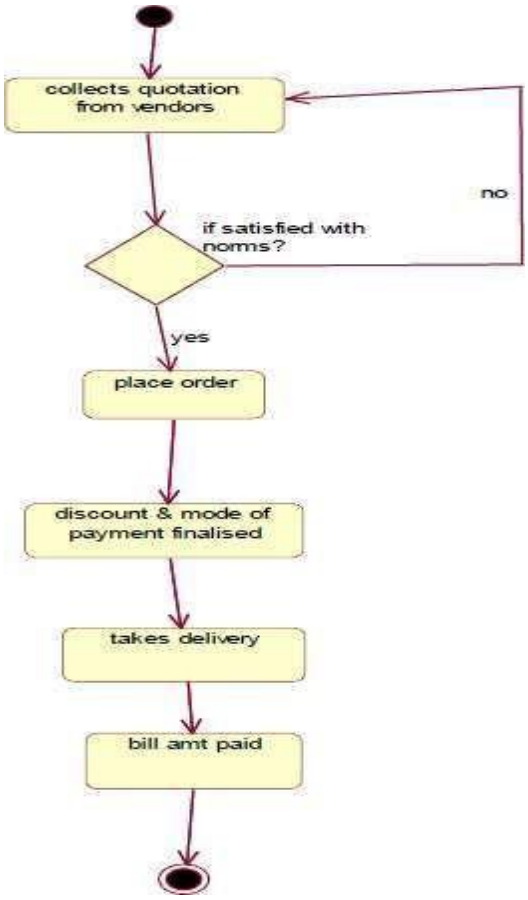

Figure 3. Activity Diagram for Book Bank System [order book]

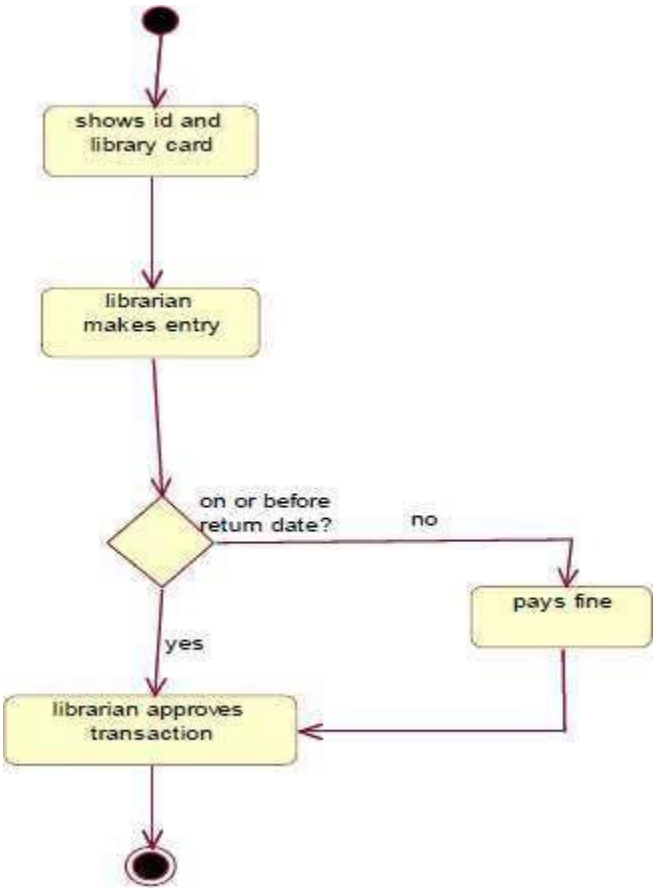

Figure 4. Activity Diagram for Book Bank System [Return book]

Sequence Diagram:

A sequence diagram represents the sequence and interactions of a given USE-CASE or scenario. Sequence diagrams can capture most of the information about the system. Most object to object interactions and operations are considered events and events include signals, inputs, decisions, interrupts, transitions and actions to or from users or external devices.

An event also is considered to be any action by an object that sends information. The event line represents a message sent from one object to another, in which the "form" object is requesting an operation be performed by the "to" object. The "to" object performs the operation using a method that the class contains.

It is also represented by the order in which things occur and how the objects in the system send message to one another.

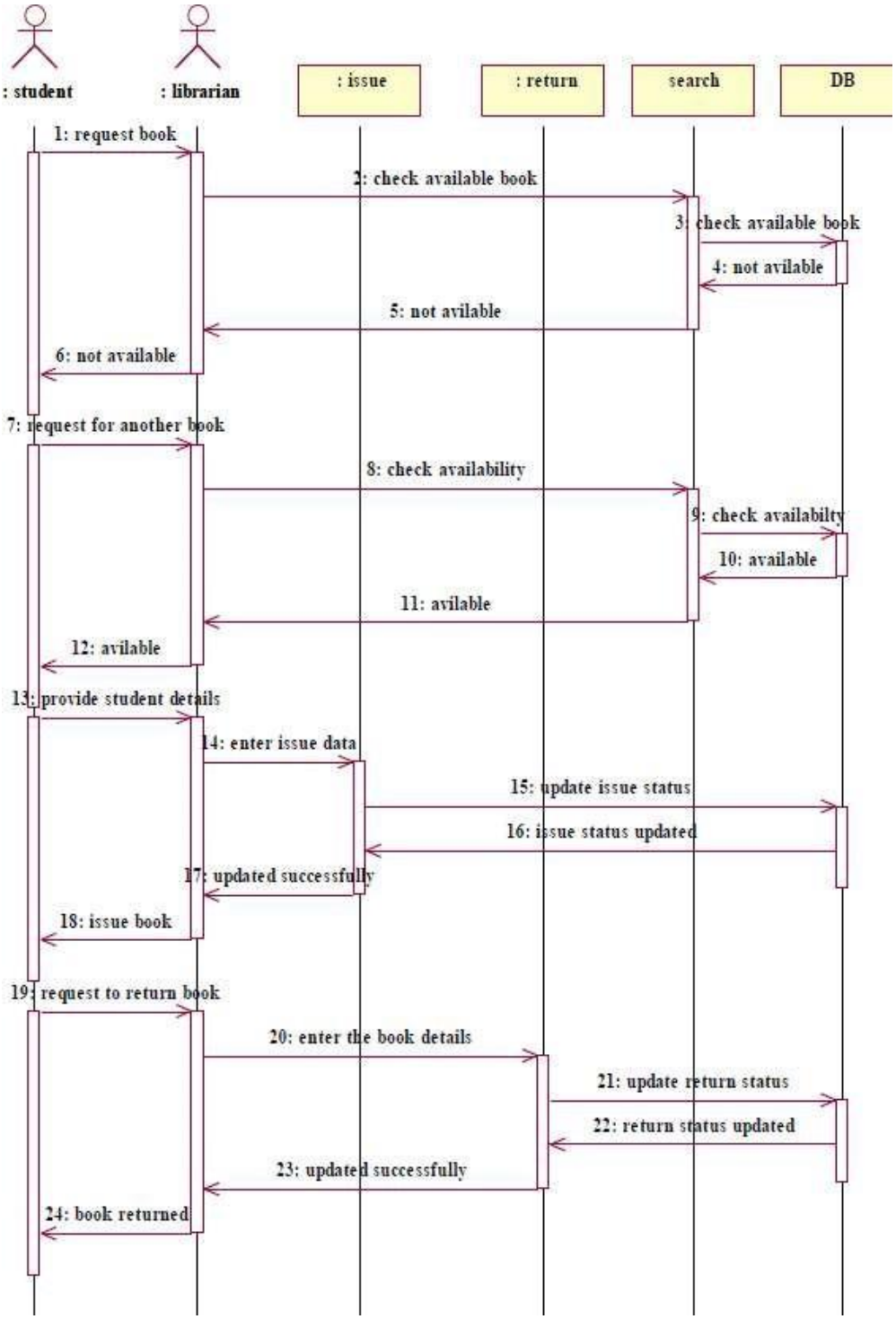

Figure 5. Sequence Diagram For Book Issue & Return

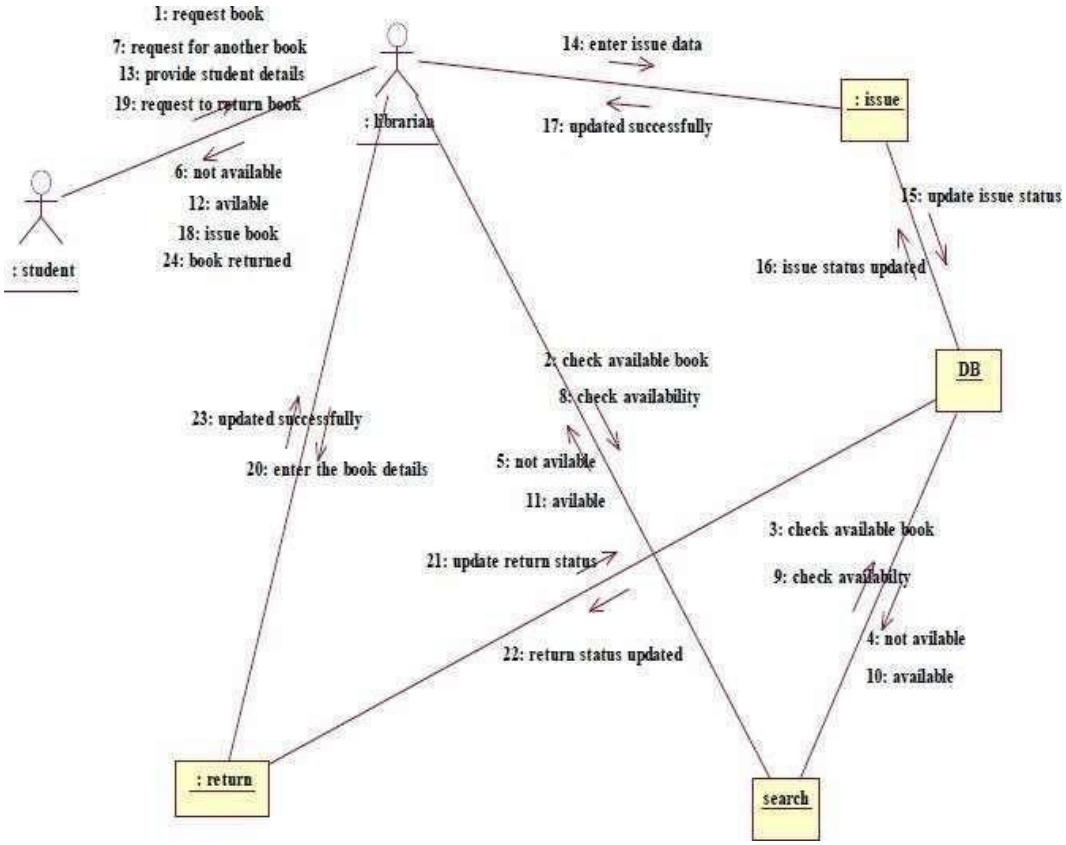

Figure 6. Collaboration Diagram For Book Issue & Return

Class Diagram:

The class diagram, also referred to as object modeling is the main static analysis diagram. The main task of object modeling is to graphically show what each object will do in the problem domain. The problem domain describes the structure and the relationships among objects.

The ATM system class diagram consists of four classes:

1. Student
2. Book
3. Issue
4. Return
5. Vendor
6. Details

1) Student:

It consists of twelve attributes and three operations. The attributes are enrollno, name, DOB, fathername, address, dept name, batch and book limits. The operations of this class are addStInfo(), deleteStInfo(), modifyStInfo().

2) Book:

It consists of ten attributes and four operations. This class is used to keep book information such as author, title, vendor, price, etc

3) Issue:

It consists of eight attributes and two operations to maintain issue details such as, issue date, accno of issued book, name of the student who borrowed book.

4) Return:

It consists of eight attributes and two operations to maintain issue details such as, issue date, accno of issued book, name of the student who borrowed book.

5) Students:

The attributes of this class are name, dept ,year ,bcode no The operation is display students().

6) Detail:

The attributes of this class are book name, author, bcode no The operations are delete details().

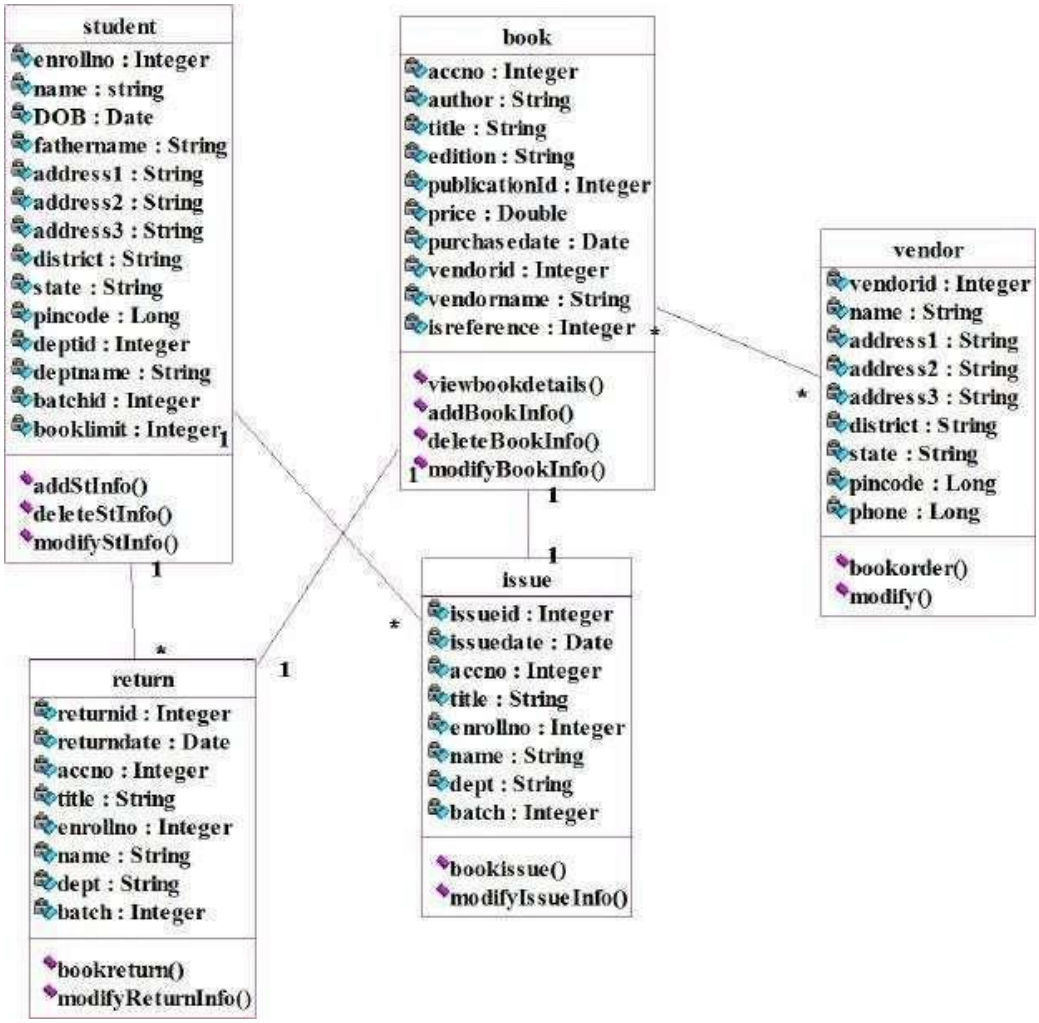

Figure 7. Class Diagram For Book Bank System

State Chart Diagram

It consists of state, events and activities. State diagrams are a familiar technique to describe the behavior of a system. They describe all of the possible states that a particular object can get into and how the object's state changes as a result of events that reach the object.

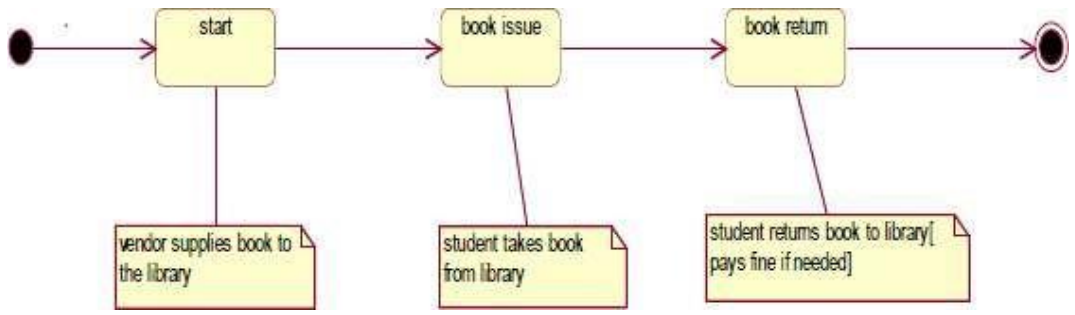

Figure 8. State Chart Diagram for BookBank System

Deployment Diagram and Component Diagram

Deployment diagrams are used to visualize the topology of the physical components of a system where the software components are deployed.

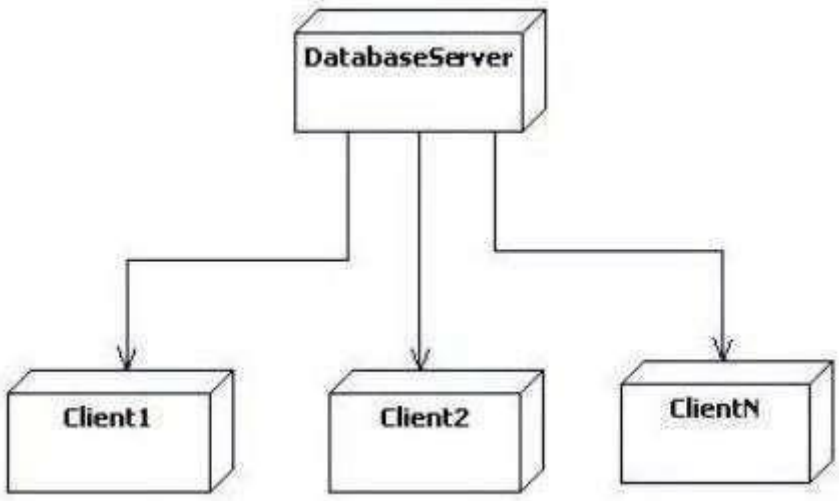

Figure 9: Deployment Diagram for Book Bank System

3. Develop test cases for unit testing and integration testing

4. Develop test cases for various white box and black box testing techniques.

LOGIN FORM:

SL.No	Test Case	Excepted Result	Test Result
1	Enter valid name and password & click on login button	Software should display main window	Successful
2	Enter invalid	Software should not display main window	successful

BOOK ENTRY FORM:

SL.No	Test Case	Excepted Result	Test Result
1	On the click of ADD button	At first user have to fill all fields with proper data , if any Error like entering text data instead of number or entering number instead of text..is found then it gives proper message otherwise Adds Record To the Database	successful
2.	On the Click of DELETE Button	This deletes the details of book by using Accession no.	Successful
3.	On the Click of UPDATE Button	Modified records are Updated in database by clicking UPDATE button.	Successful
4.	On the Click of SEARCH Button	Displays the Details of book for entered Accession no. Otherwise gives proper Error message.	Successful
5.	On the Click of CLEAR Button	Clears all fields	Successful
6.	On the Click of EXIT button	Exit the current book details form	successful
7.	On the Click of NEXT button	Display the next form	successful

USER ACCOUNT FORM:

SL.No	Test Case	Excepted Result	Test Result
1	On the click of ADD button	At first user have to fill all fields with proper data , if any Error like entering text data instead of number or entering number instead of text..is found then it gives proper message otherwise Adds Record To the Database	successful
2.	On the Click of DELETE Button	This deletes the details of student by using Register no.	Successful
3.	On the Click of UPDATE Button	Modified records are Updated in database by clicking UPDATE button.	Successful
4.	On the Click of SEARCH Button	Displays the Details of book for entered Register no. Otherwise gives proper Error message.	Successful
5.	On the Click of CLEAR Button	Clears all fields	Successful
6.	On the Click of EXIT button	Exit the current book details form	successful
7.	On the Click of NEXT button	Display the next form	successful

BOOK ISSUE FORM:

SL.No	Test Case	Excepted Result	Test Result
1	On the click of ADD button	At first user have to fill all fields with proper data ,if the accession number book is already issued then it will giving proper msg.	successful
2.	On the Click of DELETE Button	This deletes the details of book by using Register no.	Successful
3.	On the Click of UPDATE Button	Modified records are Updated in database by clicking UPDATE button.	Successful
4.	On the Click of SEARCH Button	Displays the Details of issued book..Otherwise gives proper Error message.	Successful
5.	On the Click of CLEAR Button	Clears all fields	Successful
6.	On the Click of EXIT button	Exit the current book details form	successful
7.	On the Click of NEXT button	Display the next form	successful

BOOK RETURN FORM:

SL.No	Test Case	Excepted Result	Test Result
1	On the click of ADD button	At first user have to fill all fields with proper data , if any Error like entering text data instead of number or entering number instead of text..is found then it gives proper message otherwise Adds Record To the Database	successful
2.	On the Click of DELETE Button	Which deletes the details of book by using Register no.	Successful
3.	On the Click of UPDATE Button	Modified records are Updated in database by clicking UPDATE button.	Successful

4.	On the Click of SEARCH Button	Displays the Details of returned book … Otherwise gives proper Error message.	Successful
5.	On the Click of CLEAR Button	Clears all fields	Successful
6.	On the Click of EXIT button	Exit the current book details form	successful
7.	On the Click of NEXT button	Display the next form	successful

5. Preparation of Software Requirement Specification Document:

2.1 Users Characteristics:

Student: They are the people who desire to obtain the books and submit the information to the database.

Librarian: He has the certain privileges to add the books and to approval of the reservation of books.

System Modules:

Log in: Secure registration of student and librarian by filling online registration form.

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3.Preparation of Software Configuration Management

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Front end : J2EE

Back end : My SQL Server

IDE used : Netbeans

Hardware Requirements:

Processor:i3 or higher

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6. Study and usage of any Design phase CASE tool

CASE Tool: STARUML

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Diagram Types in StarUML

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2. Class Diagram
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7. Performing the Design by using any Design phase CASE tools

CASE Tool: StarUML

Use_Case Diagram:

The book bank use cases are:

1. book_issue
2. book_return
3. book_order
4. book_entry
5. search book_details

Actors Involved:

1. Student
2. Librarian
3. Vendor

Usecase Name : Search Book_Details

The librarian initiates this use case when any member returns or request the book and checking if the book is available.

Precondition: The librarian should enter all Book details.

Normal Flow: Build message for librarian who search the book.

Post Condition: Send message to respective member who reserved the book.

Usecase Name : Book_Issue

Initiated by librarian when any member wants to borrow the desired book. If the book is available, the book is issued.

Precondition: Member should be valid member of library.

Normal Flow: Selected book will be issued to the member.

Alternative Flow: If book is not available then reserved book use case should be initiate. **Post Condition:** Update the catalogue.

Usecase Name : Book_Order

Initiated by librarian when the requested book is not available in the library at that moment. The book is reserved for the future and issued to the person when it is available.

Precondition: Initiated only when book is not available.

Normal Flow: It reserved the book if requested.

Post Condition : Mention the entry in catalogue for reservation.

Usecase Name : Book_Return

Invoked by the librarian when a member returns the book.

Precondition: Member should be valid member of library.

Normal Flow: Librarian enters bookid and system checks for return date of the book. **Alternative Flow:** System checks for return date and if it returned late fine message will be displayed.

Post Condition: Check the status of reservation.

Usecase Name : Book_Entry

The purchase book use-case when new books invoke it or magazines are added to the library.

Precondition: Not available or more copies are required.

Normal Flow: Enter bookid,author information, publication information, purchased date, prize and number of copies.

Post Condition: Update the information in catalogue.

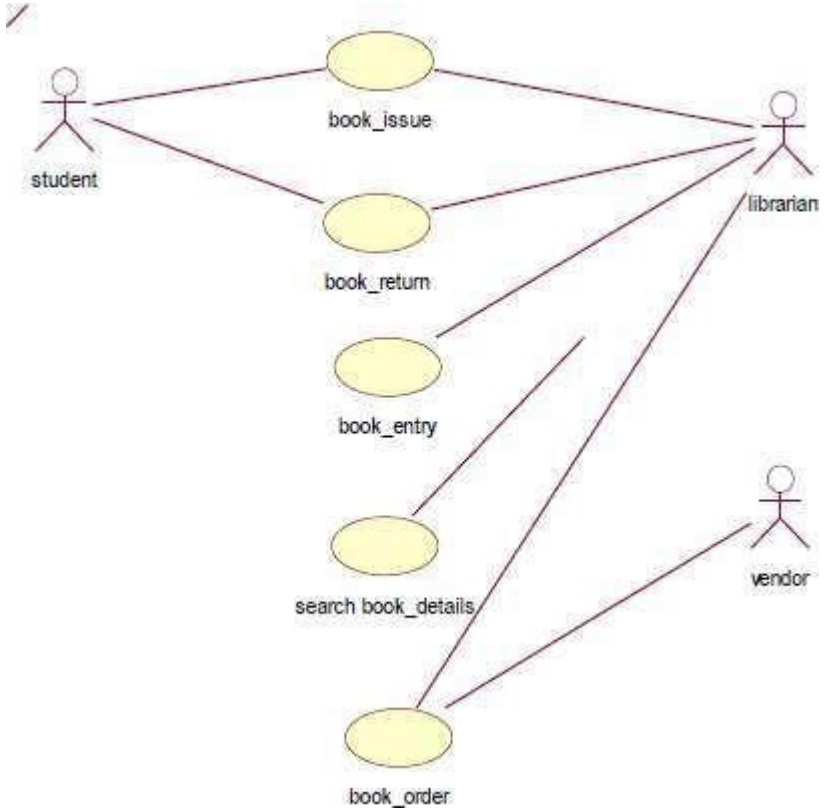

Figure 1. Usecase diagram for Book Bank System

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This activity diagram describes the behaviour of the system.

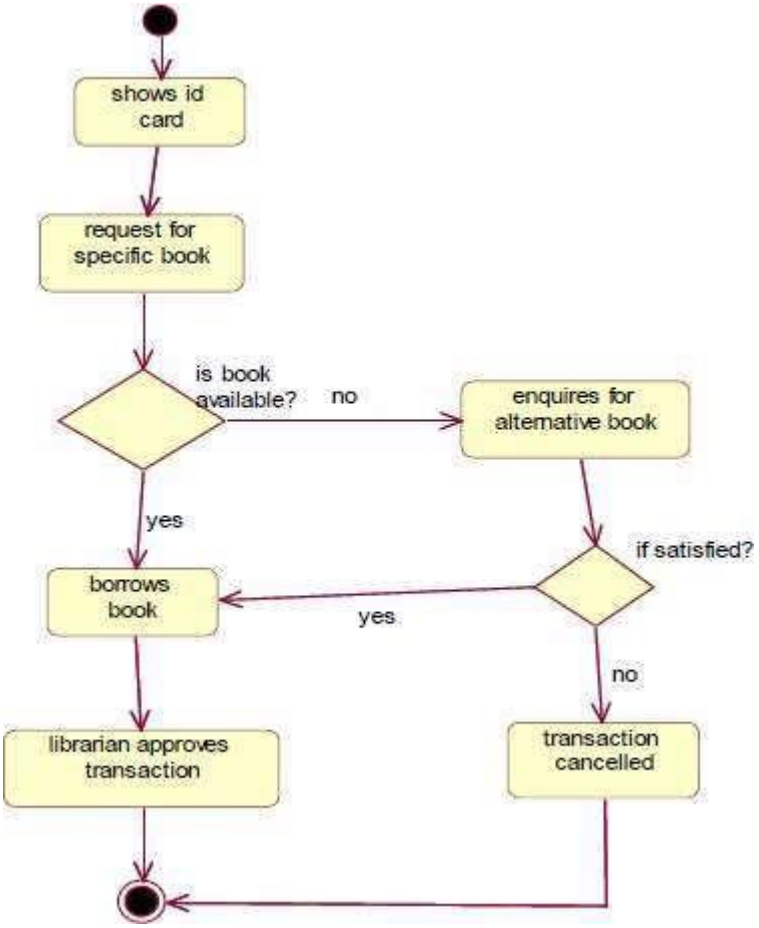


Figure 2. Activity Diagram for Book Bank System [borrow book]

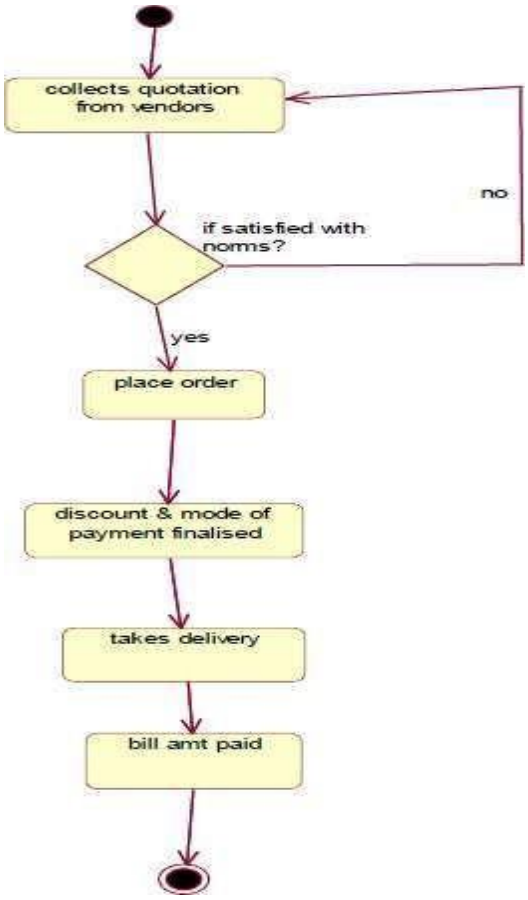


Figure 3. Activity Diagram for Book Bank System [order book]

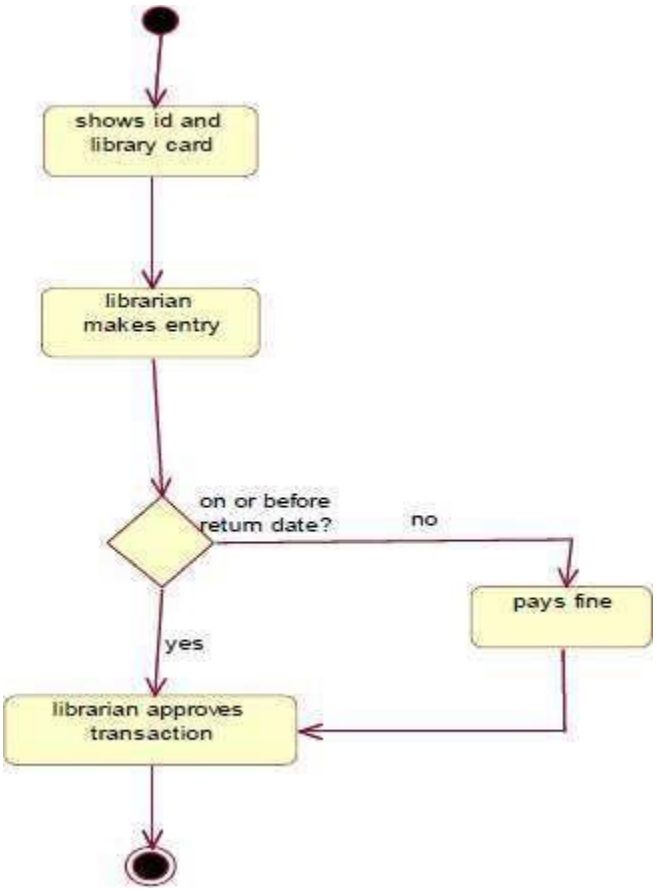


Figure 4. Activity Diagram for Book Bank System [Return book]

Sequence Diagram:

A sequence diagram represents the sequence and interactions of a given USE-CASE or scenario. Sequence diagrams can capture most of the information about the system. Most object to object interactions and operations are considered events and events include signals, inputs, decisions, interrupts, transitions and actions to or from users or external devices.

An event also is considered to be any action by an object that sends information. The event line represents a message sent from one object to another, in which the "form" object is requesting an operation be performed by the "to" object. The "to" object performs the operation using a method that

the class contains.

It is also represented by the order in which things occur and how the objects in the system send message to one another.

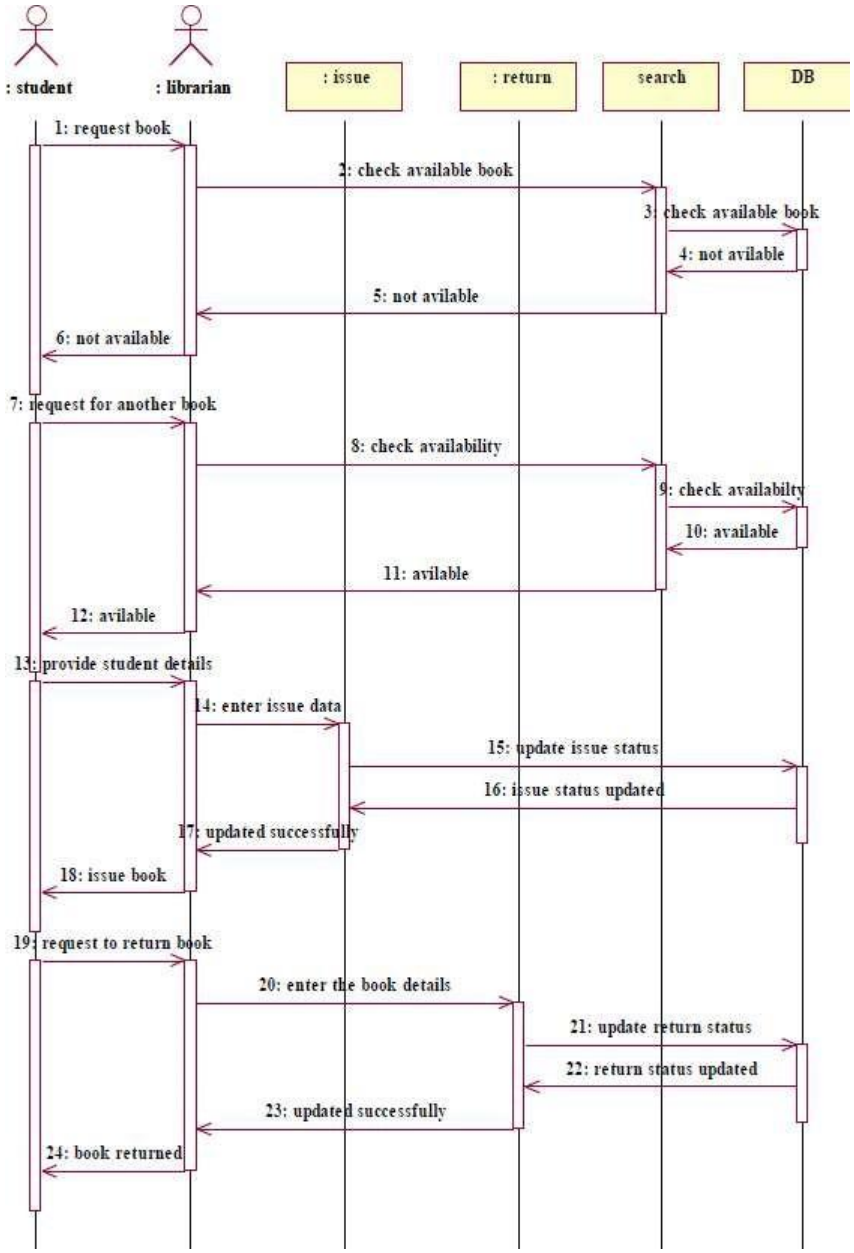


Figure 5. Sequence Diagram For Book Issue & Return

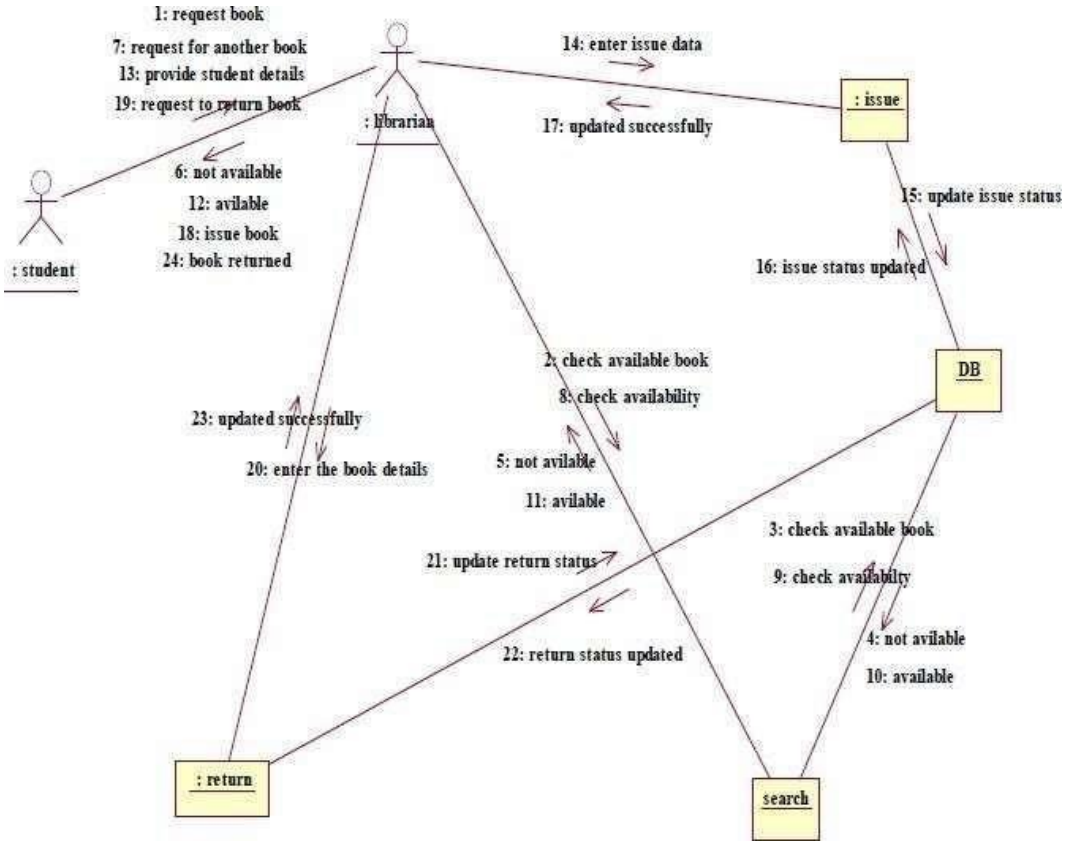


Figure 6. Collaboration Diagram For Book Issue & Return

Class Diagram:

The class diagram, also referred to as object modeling is the main static analysis diagram. The main task of object modeling is to graphically show what each object will do in the problem domain. The problem domain describes the structure and the relationships among objects.

The ATM system class diagram consists of four classes:

1. Student
2. Book
3. Issue
4. Return
5. Vendor
6. Details

1) Student:

It consists of twelve attributes and three operations. The attributes are enrollno, name, DOB, fathername, address, dept name, batch and book limits. The operations of this class are addStInfo(), deleteStInfo(), modifyStInfo().

2) Book:

It consists of ten attributes and four operations. This class is used to keep book information such as author, title, vendor, price, etc

3) Issue:

It consists of eight attributes and two operations to maintain issue details such as, issue date, accno of issued book, name of the student who borrowed book.

4) Return:

It consists of eight attributes and two operations to maintain issue details such as, issue date, accno of issued book, name of the student who borrowed book.

5) Students:

The attributes of this class are name, dept ,year ,bcode no The operation is display students().

6) Detail:

The attributes of this class are book name, author, bcode no The operations are delete details().

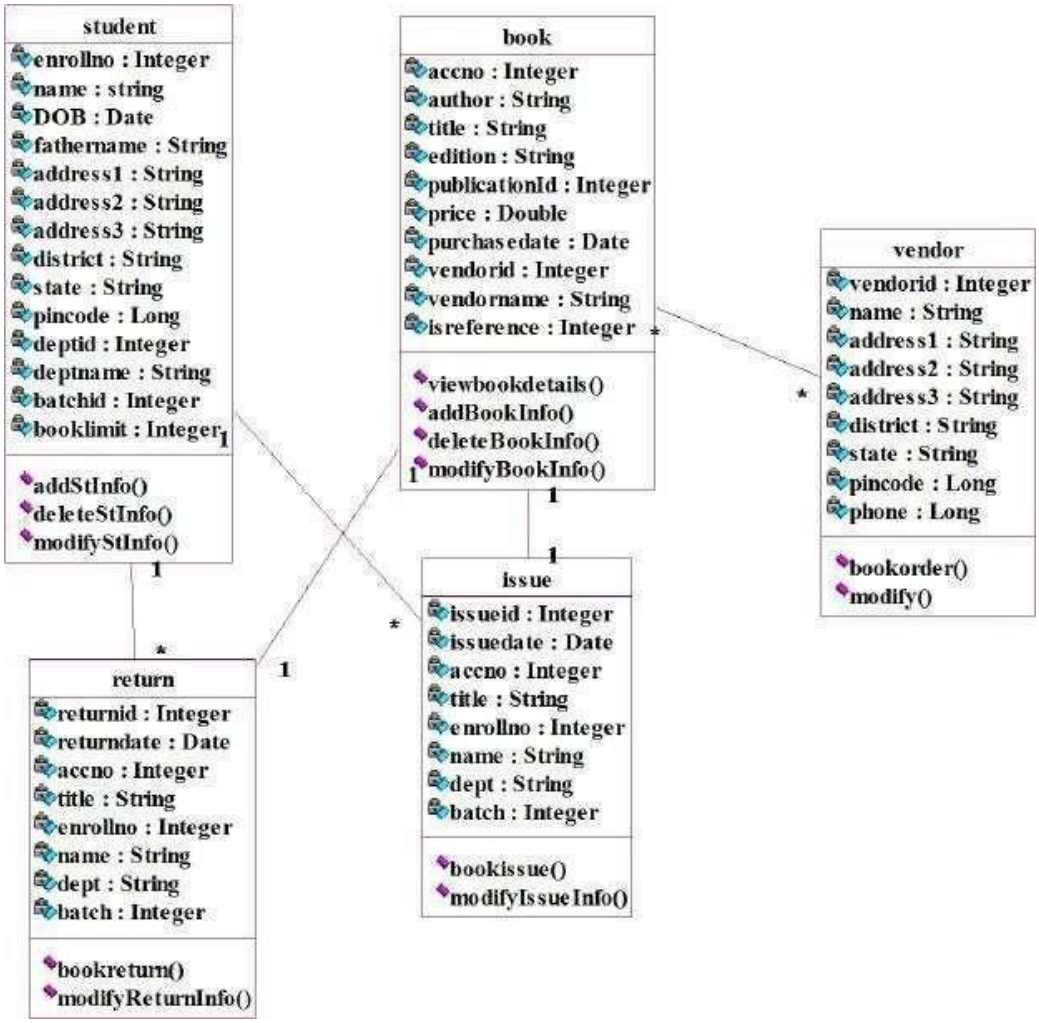


Figure 7. Class Diagram For Book Bank System

State Chart Diagram

It consists of state, events and activities. State diagrams are a familiar technique to describe the behavior of a system. They describe all of the possible states that a particular object can get into and how the object's state changes as a result of events that reach the object.

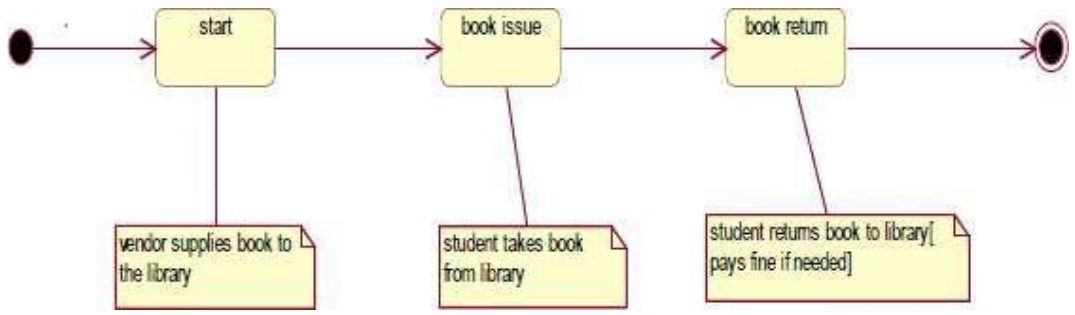


Figure 8. State Chart Diagram for BookBank System

Deployment Diagram and Component Diagram

Deployment diagrams are used to visualize the topology of the physical components of a system where the software components are deployed.

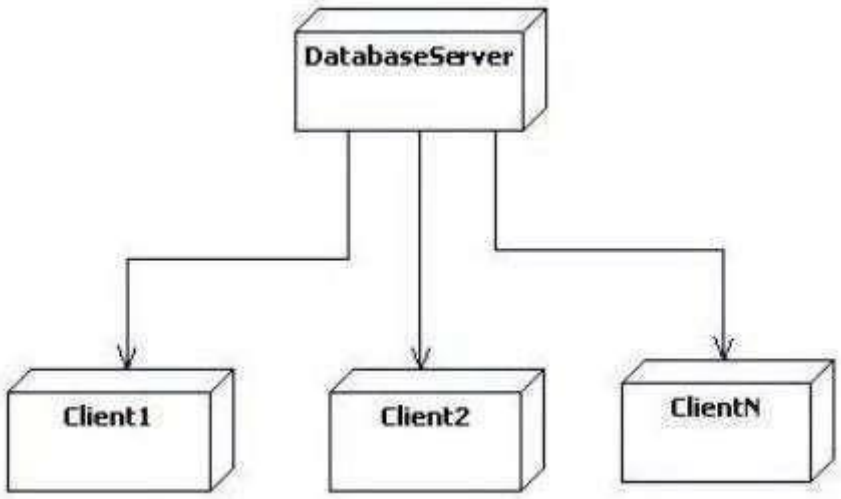


Figure 9: Deployment Diagram for Book Bank System

8. **Develop test cases for unit testing and integration testing**

9. **Develop test cases for various white box and black box testing techniques.**

LOGIN FORM:

SL.No	Test Case	Excepted Result	Test Result
1	Enter valid name and password & click on login button	Software should display main window	Successful
2	Enter invalid	Software should not display main window	successful

BOOK ENTRY FORM:

SL.No	Test Case	Excepted Result	Test Result
1	On the click of ADD button	At first user have to fill all fields with proper data , if any Error like entering text data instead of number or entering number instead of text..is found then it gives proper message otherwise Adds Record To the Database	successful
2.	On the Click of DELETE Button	This deletes the details of book by using Accession no.	Successful
3.	On the Click of UPDATE Button	Modified records are Updated in database by clicking UPDATE button.	Successful
4.	On the Click of SEARCH Button	Displays the Details of book for entered Accession no. Otherwise gives proper Error message.	Successful
5.	On the Click of CLEAR Button	Clears all fields	Successful
6.	On the Click of EXIT button	Exit the current book details form	successful
7.	On the Click of NEXT button	Display the next form	successful

USER ACCOUNT FORM:

SL.No	Test Case	Excepted Result	Test Result
1	On the click of ADD button	At first user have to fill all fields with proper data , if any Error like entering text data instead of number or entering number instead of text..is found then it gives proper message otherwise Adds Record To the Database	successful
2.	On the Click of DELETE Button	This deletes the details of student by using Register no.	Successful
3.	On the Click of UPDATE Button	Modified records are Updated in database by clicking UPDATE button.	Successful
4.	On the Click of SEARCH Button	Displays the Details of book for entered Register no. Otherwise gives proper Error message.	Successful
5.	On the Click of CLEAR Button	Clears all fields	Successful
6.	On the Click of EXIT button	Exit the current book details form	successful
7.	On the Click of NEXT button	Display the next form	successful

BOOK ISSUE FORM:

SL.No	Test Case	Excepted Result	Test Result
1	On the click of ADD button	At first user have to fill all fields with proper data ,if the accession number book is already issued then it will giving proper msg.	successful
2.	On the Click of DELETE Button	This deletes the details of book by using Register no.	Successful
3.	On the Click of UPDATE Button	Modified records are Updated in database by clicking UPDATE button.	Successful
4.	On the Click of SEARCH Button	Displays the Details of issued book..Otherwise gives proper Error message.	Successful
5.	On the Click of CLEAR Button	Clears all fields	Successful
6.	On the Click of EXIT button	Exit the current book details form	successful
7.	On the Click of NEXT button	Display the next form	successful

BOOK RETURN FORM:

SL.No	Test Case	Excepted Result	Test Result
1	On the click of ADD button	At first user have to fill all fields with proper data , if any Error like entering text data instead of number or entering number instead of text..is found then it gives proper message otherwise Adds Record To the Database	successful
2.	On the Click of DELETE Button	Which deletes the details of book by using Register no.	Successful
3.	On the Click of UPDATE Button	Modified records are Updated in database by clicking UPDATE button.	Successful

4.	On the Click of SEARCH Button	Displays the Details of returned book … Otherwise gives proper Error message.	Successful
5.	On the Click of CLEAR Button	Clears all fields	Successful
6.	On the Click of EXIT button	Exit the current book details form	successful
7.	On the Click of NEXT button	Display the next form	successful

AIM:

To Analyze the Problems, Gather the **SRS**(Software Requirements Specification) and Model the UML or OOAD diagrams for "**Passport Automation System**" using Rational Rose Software in CS1403 - CASE Tools Laboratory.

PROBLEM STATEMENTS:

Passport Automation System is used in the effective dispatch of passport to all of the applicants. This system adopts a comprehensive approach to minimize the manual work and schedule resources, time in a cogent manner. The core of the system is to get the online registration form (with details such as name, address etc.,) filled by the applicant whose testament is verified for its genuineness by the Passport Automation System with respect to the already existing information in the database. This forms the first and foremost step in the processing of passport application. After the first round of verification done by the system, the information is in turn forwarded to the regional administrator's (Ministry of External Affairs) office. The application is then processed manually based on the report given by the system, and any forfeiting identified can make the applicant liable to penalty as per the law. The system also provides the applicant the list of available dates for appointment to 'document verification' in the administrator's office, from which they can select one. The system forwards the necessary details to the police for its separate verification whose report is then presented to the administrator. The administrator will be provided with an option to display the current status of application to the applicant, 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 passport is sent to the applicant.

SOFTWARE REQUIREMENTS SPECIFICATION:

1.0 Introduction

Passport Automation System is an interface between the Applicant and the Authority responsible for the Issue of Passport. It aims at improving the efficiency in the Issue of Passport and reduce the complexities involved in it to the maximum possible extent.

1.1 Purpose

If the entire process of 'Issue of Passport' is done in a manual manner then it would take several months for the passport to reach the applicant. Considering the fact that the number of applicants for passport 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. As this is a matter of National Security, the system has been carefully verified and validated in order to satisfy it.

1.2 Scope

- 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 passport can use this system to reduce his workload and process the application in a speedy manner.
- Provide a communication platform between the applicant and the administrator.

• Transfer of data between the Passport Issuing Authority and the Local Police for verification of applicant's information.
• Users/Applicants will come to know their status of application and the date in which they must subject themselves for manual document verification.

1.3 Definitions, Acronyms and the Abbreviations

• Administrator - Refers to the super user who is the Central Authority who has been vested with the privilege to manage the entire system. It can be any higher official in the Regional Passport Office of Ministry of External Affairs.
• Applicant - One who wishes to obtain the Passport.
• PAS - Refers to this Passport Automation System.
• HTML - Markup Language used for creating web pages.
• J2EE – Java 2 Enterprise Edition is a programming platform and it is the partof the java platform for developing and running distributed java applications.
• HTTP - Hyper Text Transfer Protocol.
• TCP/IP – Transmission Control Protocol/Internet Protocol is the communication protocol used to connect hosts on the Internet.

1.4 References

IEEE Software Requirement Specification format.

1.5 Technologies to be used

• HTML
• JSP
• Javascript
• Java
• XML
• AJAX

1.6 Tools to be Used

• Eclipse IDE (Integrated Development Enivronment)
• Rational Rose tool (for developing UML Patterns)

1.7 Overview

SRS includes two sections overall description and specific requirements - Overall description will describe major role of the system components and inter-connections. Specific requirements will describe roles & functions of the actors.

2.0 Overall Description

2.1 Product Perspective

The PAS acts as an interface between the 'applicant' and the 'administrator'. This system tries to make the interface as simple as possible and at the same time not risking the security of data stored in.This minimizes the time duration in which the user receives the passport.

2.2 Software Interface

• Front End Client - The applicant and Administrator online interface is built using JSP and HTML.

The Administrators's local interface is built using Java.
• Web Server - Glassfish application server(Oracle Corporation).
• Back End - Oracle database.

2.3 Hardware Interface

The server is directly connected to the client systems. The client systems have access to the database in the server.

2.4 System Functions

• Secure Registration of information by the Applicants.
• Schedule the applicants an appointment for manual verification of original documents.
• Panel for Passport Application Status Display by the Administrator.
• SMS and Mail updates to the applicants by the administrator.
• Administrator can generate reports from the information and is the only authorized personnel to add the eligible application information to the database.

2.5 User Characteristics

• Applicant - They are the people who desires to obtain the passport and submit the information to the database.
• Administrator - He has the certain privileges to add the passport status and to approve the issue of passport. He may contain a group of persons under him to verify
the documents and give suggestion whether or not to approve the dispatch of passport.
• Police - He is the person who upon receiving intimation from the PAS, perform a personal verification of the applicant and see if he has any criminal case against him before or at present. He has been vetoed with the power to decline an application by suggesting it to the Administrator if he finds any discrepancy with the applicant. He communicates via this PAS.

2.6 Constraints

• The applicants require a computer to submit their information.
• Although the security is given high importance, there is always a chance of intrusion in the web world which requires constant monitoring.
• The user has to be careful while submitting the information. Much care is required.

2.7 Use Case Model Description

Use Case diagrams identify the functionality provided by the system (use cases), the users who interact with the system (actors), and the association between the users and the functionality. Use Cases are used in the Analysis phase of software development to articulate the high-level requirements of the system. The primary goals of Use Case diagrams include:

- Providing a high-level view of what the system does.
- Identifying the users ("actors") of the system.
- Determining areas needing human-computer interfaces.

2.8 Assumptions and Dependencies

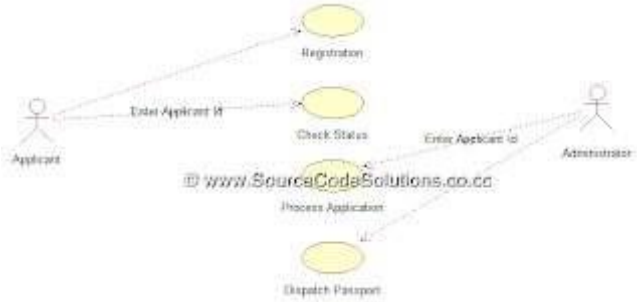
• The Applicants and Administrator must have basic knowledge of computers and English Language.

• The applicants may be required to scan the documents and send.

UML DIAGRAMS:

USE CASE DIAGRAM:

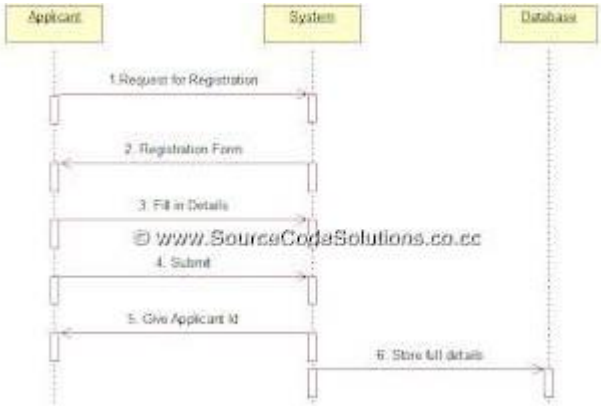
The UML provides the use case diagram notation to illustrates the name of the use case actors and relationship between them.



SEQUENCE DIAGRAM:

- A sequence diagram illustrates in a kind of format in which each object interact via messages. It is generalization between two or more specification diagram.
- Sequence diagram is an interaction over view diagram. It provides a big picture over view of now a set of interaction is related in terms of logic and process flow.

New Registration:



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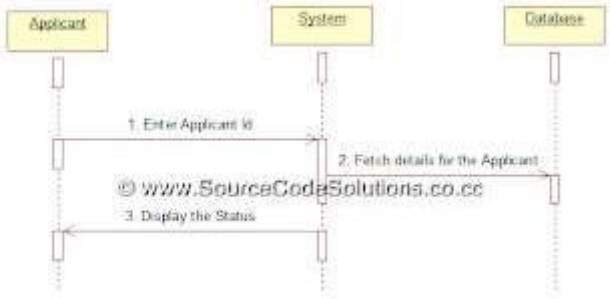
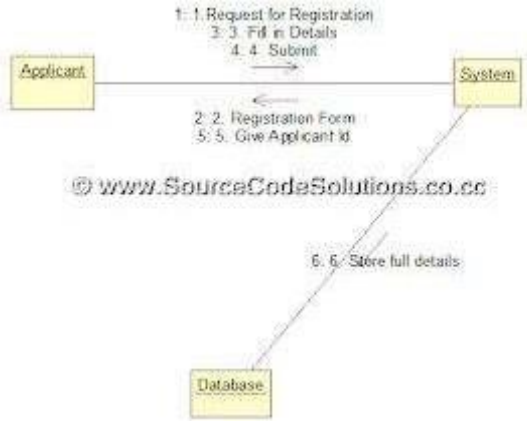


Admin Panel:

COLLABORATION DIAGRAM:

- It illustrates that object interaction in a graph or network format in which object can be placed any where on the diagram.
- In collaboration diagram the relationship between applicant, system admin and authority. The people must fill the application form according to detailed furnished. The system admin verifies the all details and forward details to authority. He is enquiry the person and then issue the passport to applicant.

New Registration:



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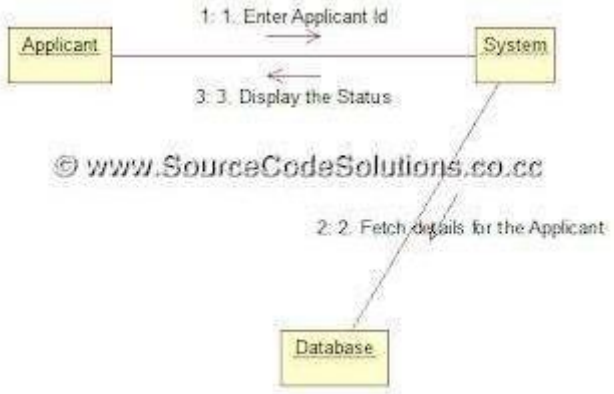


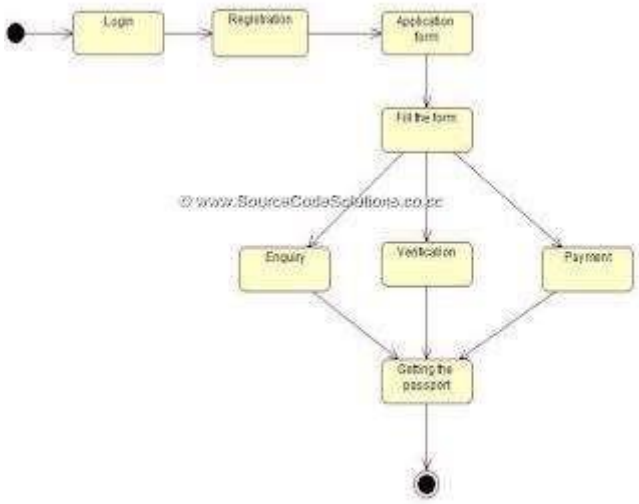
Admin Panel:

CLASS DIAGRAM:

- The UML include the class diagram, to illustrate and their association. They are used for static object modeling.

STATE CHART DIAGRAM:

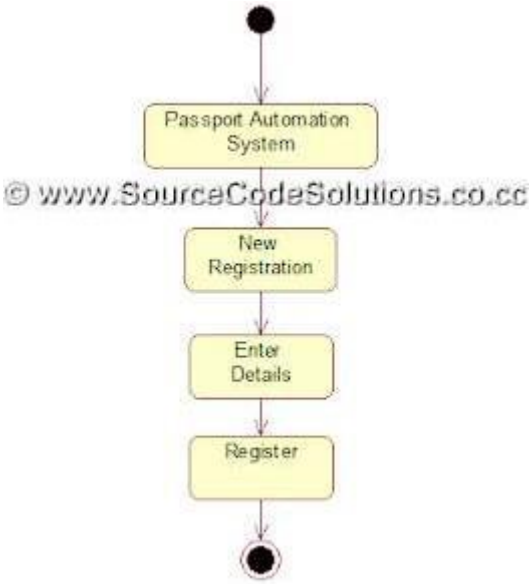
- It illustrates the intrusting events and state of an object and behaviors of an object is reaction to an event. Transaction shows as allows labeled with theirs event. It is included with initial pseudo state and final end state.
- The state chart diagram of passport automation system that the service of authority, who is issues the passport received by the applicant and getting the passport.



ACTIVITY DIAGRAM:

- Activity diagram shows sequential and parallel activities in a process. They are useful for modeling business, workflows, the data flows and complex algorithm.
- A UML activity diagram offers rich notation to flows a sequential of activities. It may be including parallel activities. It may be applied to any purpose, but it is popular for visualization of business workflows and use case.

New Registration:



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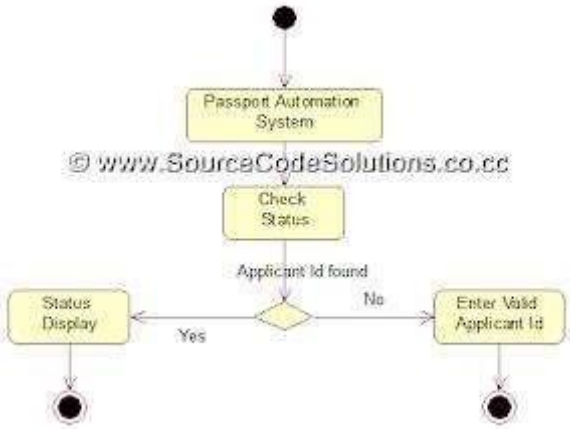
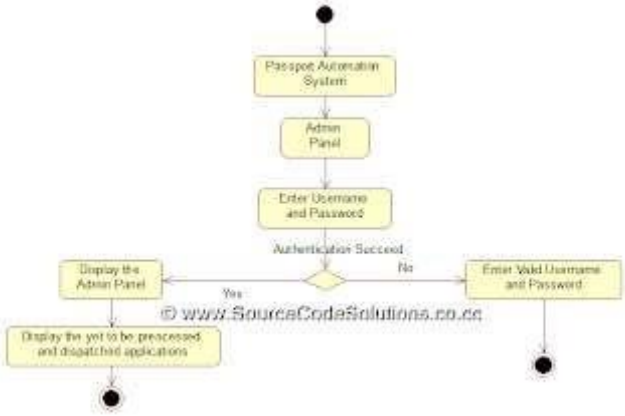
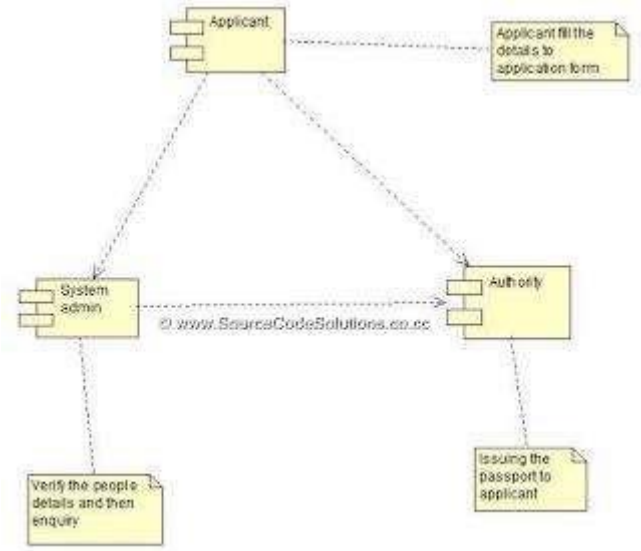


Admin Panel:



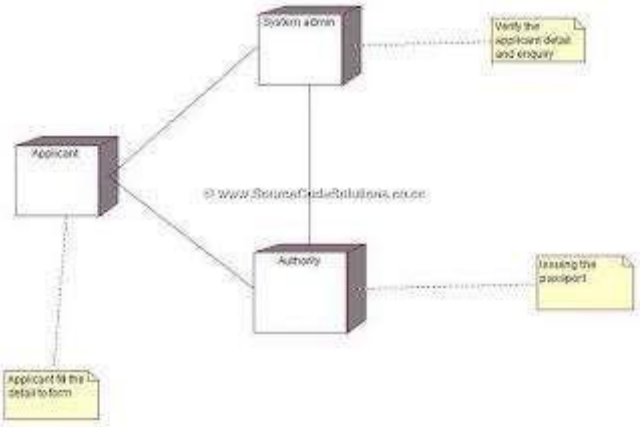
COMPONENT DIAGRAM:

- A component represent a modular part of a system, that encapsulates it contents and whose manifestation is replaced with in its environment. A component define its behaviors in terms of provide and required interfaces.
- Here the three components are applicant, system admin and authority.
- The interface between people and system admin, from people to authority.



DEPLOYMENT DIAGRAM:

- A deployment shows the assignment of concrete artifacts to computational nodes. It shows the deployment of software elements to the physical architecture, and the communication. Deployment diagrams are useful to communicate the physical and deployment architecture.
- In the deployment diagram the object reference in component diagram is also included the deployment diagram. In this authority and system admin, interface through the people.
- It is the process of installing the program.



RESULT:

Thus the "**Passport Automation System**" application was successfully designed and the output was verified using star UML Laboratory..