LAB MANUAL

OBJECT ORIENTED ANALYSIS AND DESIGN LABORATORY

Academic Year	**:**	**2019 - 2020**
Course Code	**:**	**ACS108**
Regulations	**:**	**IARE - R16**
Semester	**:**	**VI**
Branch	**:**	**CSE**

Prepared by

Ms. N Shalini
Assistant Professor

COMPUTER SCIENCE AND ENGINEERING

INSTITUTE OF AERONAUTICAL ENGINEERING
(Autonomous)
Dundigal, Hyderabad - 500 043

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(Autonomous)

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Vision

To bring forth professionally competent and socially sensitive engineers, capable of working across cultures meeting the global standards ethically.

Mission

To provide students with an extensive and exceptional education that prepares them to excel in their profession, guided by dynamic intellectual community and be able to face the technically complex world with creative leadership qualities.

Further, be instrumental in emanating new knowledge through innovative research that emboldens entrepreneurship and economic development for the benefit of wide spread community.

Quality Policy

Our policy is to nurture and build diligent and dedicated community of engineers providing a professional and unprejudiced environment, thus justifying the purpose of teaching and satisfying the stake holders.

A team of well qualified and experienced professionals ensure quality education with its practical application in all areas of the Institute.

Philosophy

The essence of learning lies in pursuing the truth that liberates one from the darkness of ignorance and Institute of Aeronautical Engineering firmly believes that education is for liberation.

Contained therein is the notion that engineering education includes all fields of science that plays a pivotal role in the development of world-wide community contributing to the progress of civilization. This institute, adhering to the above understanding, is committed to the development of science and technology in congruence with the natural environs. It lays great emphasis on intensive research and education that blends professional skills and high moral standards with a sense of individuality and humanity. We thus promote ties with local communities and encourage transnational interactions in order to be socially accountable. This accelerates the process of transfiguring the students into complete human beings making the learning process relevant to life, instilling in them a sense of courtesy and responsibility.

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Program Outcomes	
PO1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineeringfundamentals, and an engineering specialization to the solution of complex engineering problems.
PO2	**Problem analysis**: Identify, formulate, review research literature, and analyze complexengineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO3	**Design/development of solutions**: Design solutions for complex engineering problems anddesign 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.
PO4	**Conduct investigations of complex problems**: Use research-based knowledge and researchmethods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modernengineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
PO6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assesssocietal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO7	**Environment and sustainability**: Understand the impact of the professional engineering solutionsin societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO8	**Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms ofthe engineering practice.
PO9	**Individual and team work**: Function effectively as an individual, and as a member or leader indiverse teams, and in multidisciplinary settings.
PO10	**Communication**: Communicate effectively on complex engineering activities with the engineeringcommunity 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.
PO11	**Project management and finance**: Demonstrate knowledge and understanding of theengineering 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.
PO12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage inindependent and life-long learning in the broadest context of technological change.

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Program Specific Outcomes	
PSO1	**Professional Skills:** The ability to understand, analyze and develop computer programs in the areas related to algorithms, system software, multimedia, web design, big data analytics, and networking for efficient design of computer-based systems of varying complexity.
PSO2	**Problem-Solving Skills:** The ability to apply standard practices and strategies in software project development using open-ended programming environments to deliver a quality product for business success.
PSO3	**Successful Career and Entrepreneurship:** The ability to employ modern computer languages, environments, and platforms in creating innovative career paths to be an entrepreneur, and a zest for higher studies.

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ATTAINMENT OF PROGRAM OUTCOMES & PROGRAM SPECIFIC OUTCOMES

EXPT.No.	COMPUTER SCIENCE AND ENGINEERING	
	Program Outcomes Attained	Program Specific Outcomes Attained
I	PO1, PO2, PO3	PSO2, PSO3
II	PO1, PO2, PO3	PSO2, PSO3
III	PO1, PO2, PO3	PSO2, PSO3
IV	PO1, PO2, PO3	PSO2, PSO3
V	PO1, PO2, PO3	PSO2, PSO3
VI	PO1, PO2, PO3	PSO2, PSO3
VII	PO1, PO2, PO3, PO5	PSO2, PSO3
VIII	PO1, PO2, PO3	PSO2, PSO3
IX	PO1, PO2, PO3, PO5	PSO2, PSO3
X	PO1, PO2, PO3, PO5	PSO2, PSO3
XI	PO1, PO2, PO3, PO5	PSO2, PSO3
XII	PO1, PO2, PO3, PO5	PSO2, PSO3

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Certificate

This is to certify that it is a bonafide record of Practical work done by Sri/Kum. _____ bearing the Roll No. _____ of _____ class _____ branch in the _____ laboratory during the academic year _____ under our supervision.

Head of the Department

Lecture In-Charge

External Examiner

Internal Examiner

Index

S. No.	List of Experiments	Page No.	Date	Remarks
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Week-5	**SCENARIOS**
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Week-8	**ARCHITECTURE DIAGRAM**
Identify the User Interface, Domain objects, and Technical services	
Week-9	**ARCHITECTURE DIAGRAM**
Draw the partial layered, logical architecture diagram with UML package diagram notation	
Week-10	**COMPONENT DIAGRAM**
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Week-11	**COMPONENT DIAGRAM**

Draw a Component diagram for a. Foreign trading system b. Conference Management System c. BPO Management System	
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Draw a Component diagram for a. Passport Automation System b. Book bank management system c. Online course reservation system	

WEEK-l

SOFTWARE REQUIREMENTS SPECIFICATION

INTRODUCTION TO UML DIAGRAMS. CREATE SRS FOR RECRUITMENT SYSTEM.

ANALYSIS AND DESIGN

The applications method recommends the use of static and dynamic views of a logical model and a physical model to capture the in-process products of object-oriented analysis and design. Using the notation, the application enables you to create and refine these views within an overall model representing your problem domain and software system.

This overall model contains classes, use cases, objects, packages, operations, component packages, components, processors, devices and the relationships between them. Each of these model elements possesses model properties that identify and characterize them. The notation provides graphical icons to represent each kind of model element and relationship.

A model also contains diagrams and specifications, which provide a means of visualizing and manipulating the models elements and their model properties. Since diagrams are used to illustrate multiple views of a model, icons representing a model element can appear in none, one, or several of models diagrams. The application therefore enables you to control, which element, relationship, and property icons appear on each diagram, using facilities provided by its application window. Within its application window, it displays each diagram in a diagram window, and each specification in a specification window.

USE CASE VIEW

- Contains the use case models, flow of events and supplementary documentation.
- It is a contract between customer and developer.
- It is essential for analysis, design and test activities.
- It also contains activity diagrams.
- It contains the use case diagrams.
- It is the heart of the other views that represent the required behaviour of the system.

LOGICAL VIEW

- It supports the functional requirements of the system.
- It includes the use case realization, class diagram, interaction diagram, state chart and activity diagram.

PROCESS VIEW

- It addresses the performance, scalability and throughput of the system.
- It includes the threads and the processes that found the system concurrency and synchronization mechanism.

It is not necessary for single processing environment.

COMPONENT VIEW

- The component view addresses the ease of development management of software assets, reuse, subcontracting and of the shelf components.
- Describes the organization of static software, like source call data files components in terms of packaging, layering and configuration management.

DEPLOYMENT VIEW

- It addresses the issue like deployment installation and performance.
- The deployment view is used for distributed systems only.
- It shows the various executables like a runtime components and computing modes.
- It contains deployment diagrams.

A Software Requirements Specification (SRS) is a document that describes the nature of a project, software or application. In simple words, SRS document is a manual of a project provided it is prepared before you kick-start a project/application. This document is also known by the names SRS report, software document. A software document is primarily prepared for a project, software or any kind of application.

There are a set of guidelines to be followed while preparing the software requirement specification document. This includes the purpose, scope, functional and nonfunctional requirements, software and hardware requirements of the project. In addition to this, it also contains the information about environmental conditions required, safety and security requirements, software quality attributes of the project etc.

1. Software Requirements Specification document

A Software requirements specification document describes the intended purpose, requirements and nature of a software to be developed. It also includes the yield and cost of the software.

In this document, flight management project is used as an example to explain few points.

1.1 PURPOSE

The purpose of this document is to build an online system to manage flights and passengers to ease the flight management.

1.2 DOCUMENT CONVENTIONS

This document uses the following conventions. <<Include the conventions as per your application >>

DB Database

DDB Distributed Database

ER Entity Relationship

1.3 INTENDED AUDIENCE AND READING SUGGESTIONS

This project is a prototype for the flight management system and it is restricted within the college premises. This has been implemented under the guidance of college professors. This project is useful for the flight management team and as well as to the passengers.

1.4 PROJECT SCOPE

The purpose of the online flight management system is to ease flight management and to create a convenient and easy-to-use application for passengers, trying to buy airline tickets. The system is based on a relational database with its flight management and reservation functions.

2. OVERALL DESCRIPTION

2.1 PRODUCT PERSPECTIVE

A distributed airline database system stores the following information.

Flight details:

It includes the originating flight terminal and destination terminal, along with the stops in between, the number of seats booked/available seats between two destinations etc.

Customer description:

It includes customer code, name, address and phone number. This information may be used for keeping the records of the customer for any emergency or for any other kind of information.

Reservation description:

It includes customer details, code number, flight number, date of booking, date of travel.

WEEK-2

USE CASE DIAGRAM

1. ANALYSIS

Identifying the Actors Identifying the Use Cases

2. REQUIREMENTS

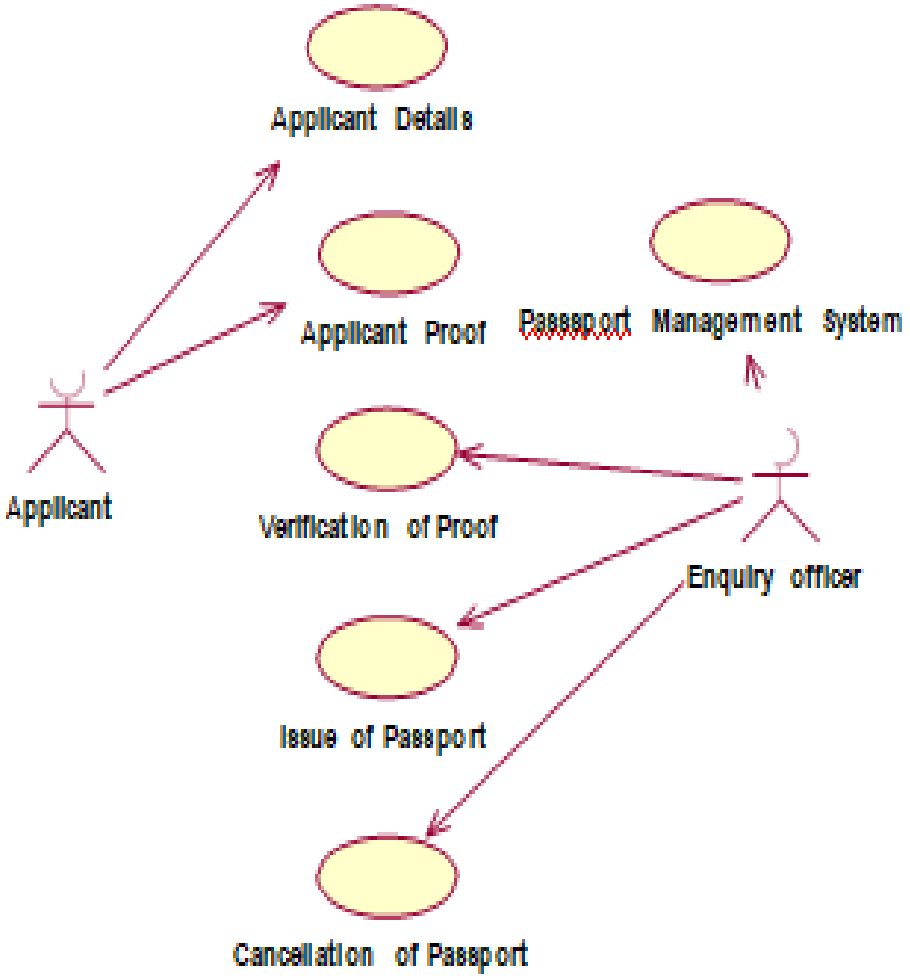
System Requirements

Software Requirements

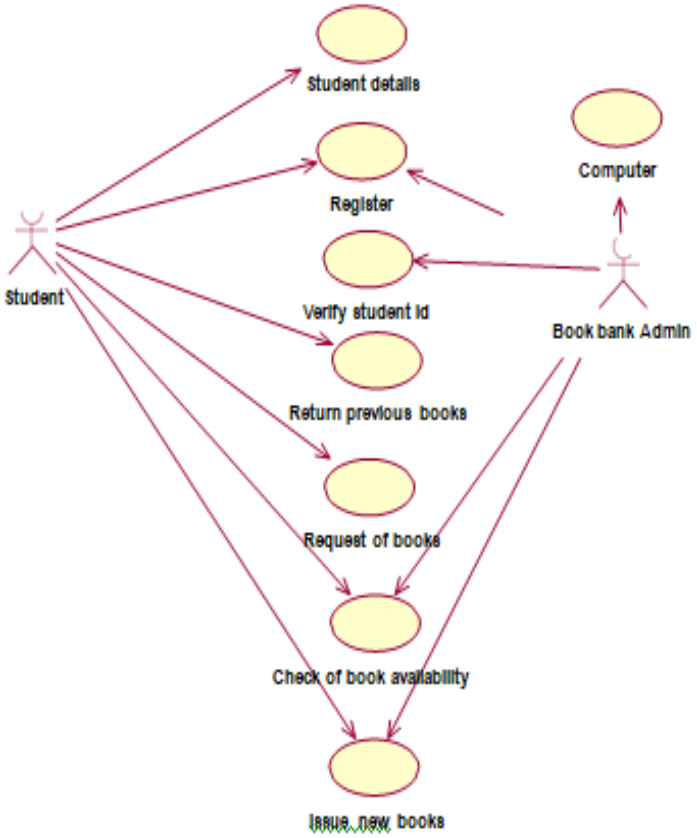
3. DESIGN

- Passport Automation System
- Book bank management system
- Online course reservation system
- Foreign trading system
- Conference Management System
- BPO Management System

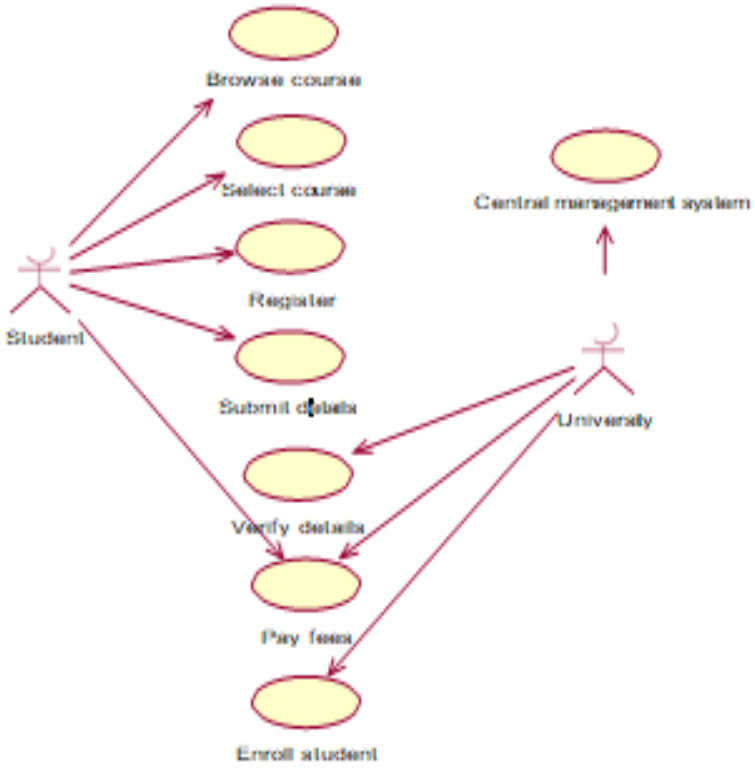
PASSPORT AUTOMATION SYSTEM



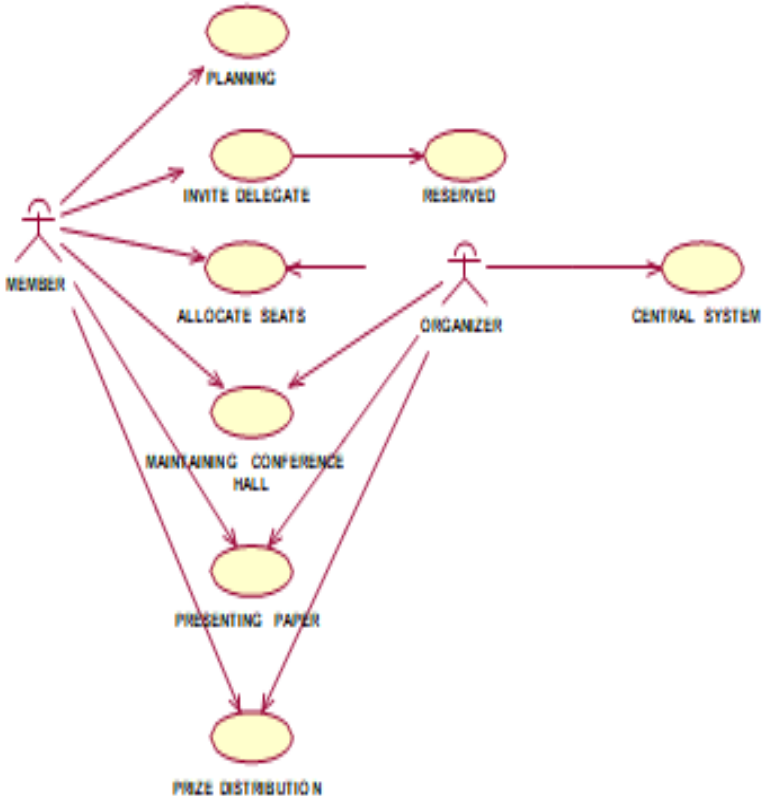
BOOK BANK REGISTRATION



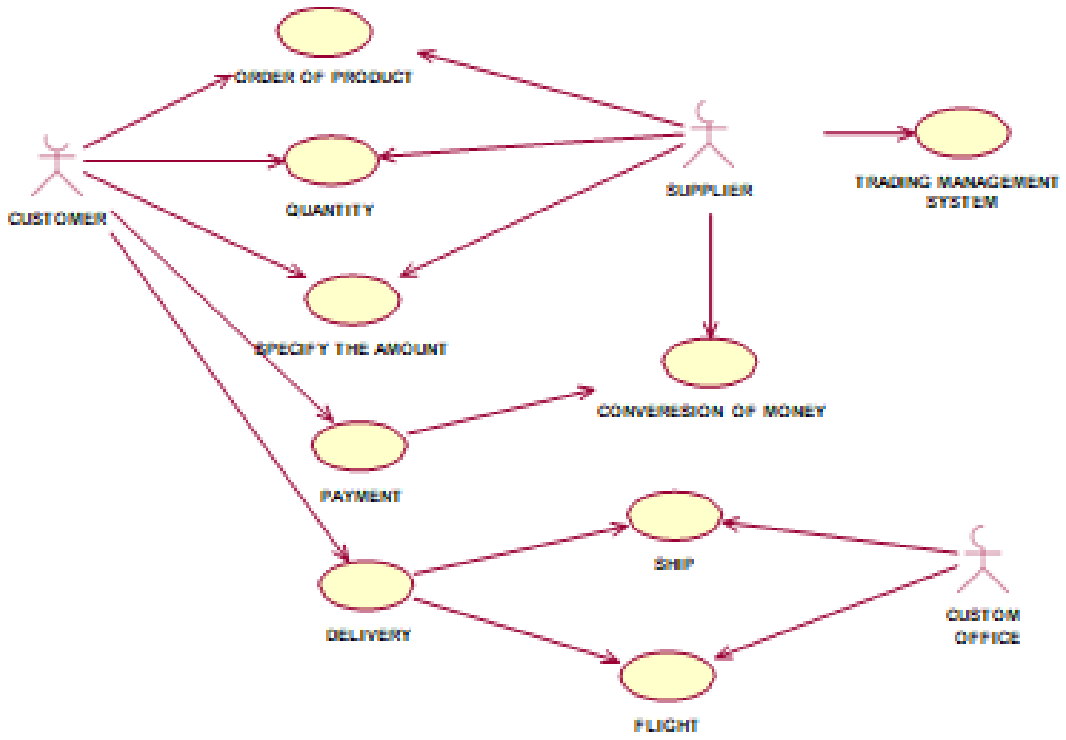
ONLINE COURSE RESERVATION SYSTEM



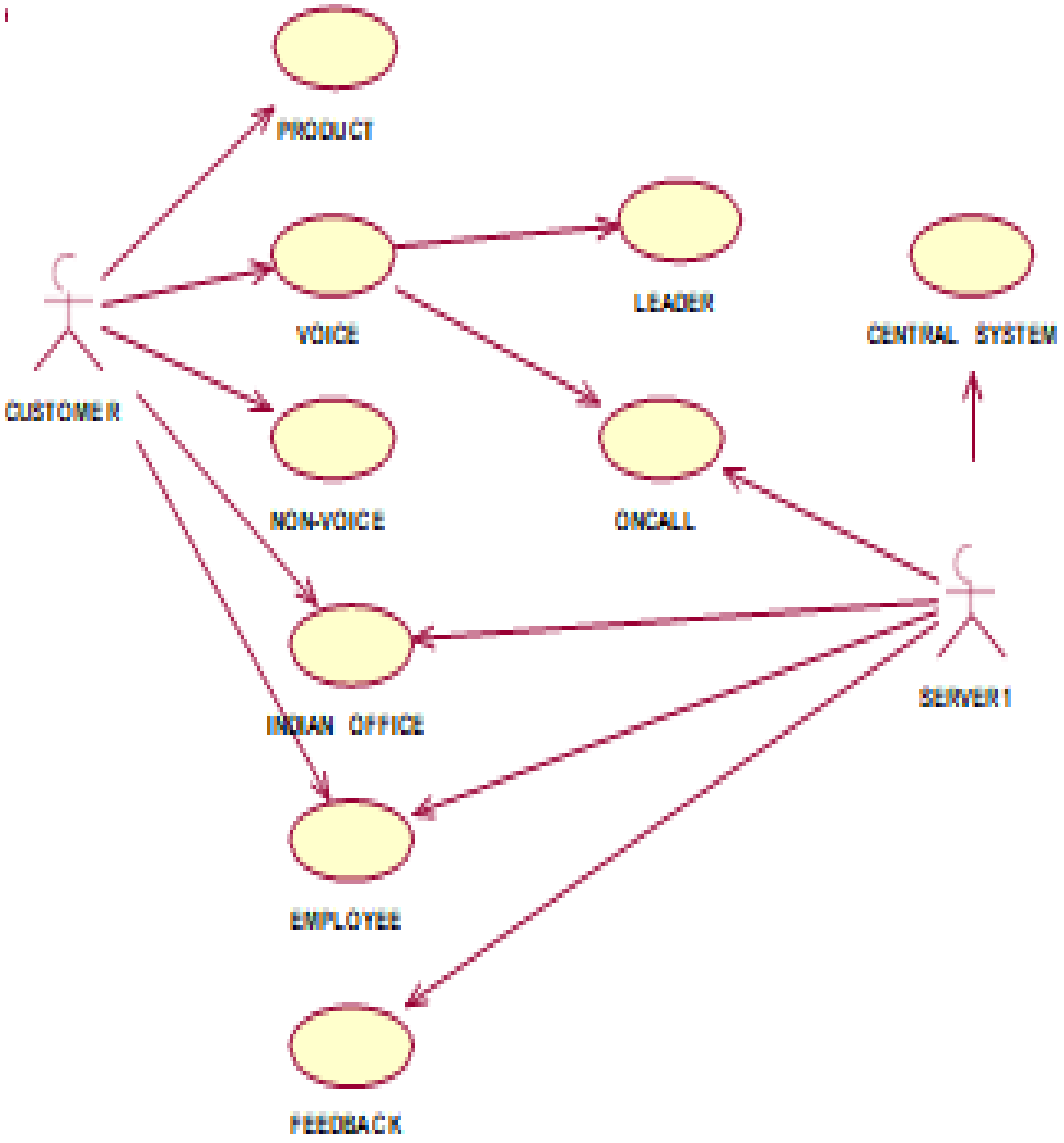
CONFERENCE MANAGEMENT SYSTEM



FOREIGN TRADING SYSTEM



BPO MANAGEMENT SYSTEM


PRODUCT
VOICE
LEADER
CENTRAL SYSTEM
CUSTOMER
NON-VOICE
ONCALL
SERVER
INDIAN OFFICE
EMPLOYEE
FEEDBACK

WEEK-3

ACTIVITY DIAGRAM

1. ANALYSIS

Identifying the Activities Identifying the Events

2. REQUIREMENTS

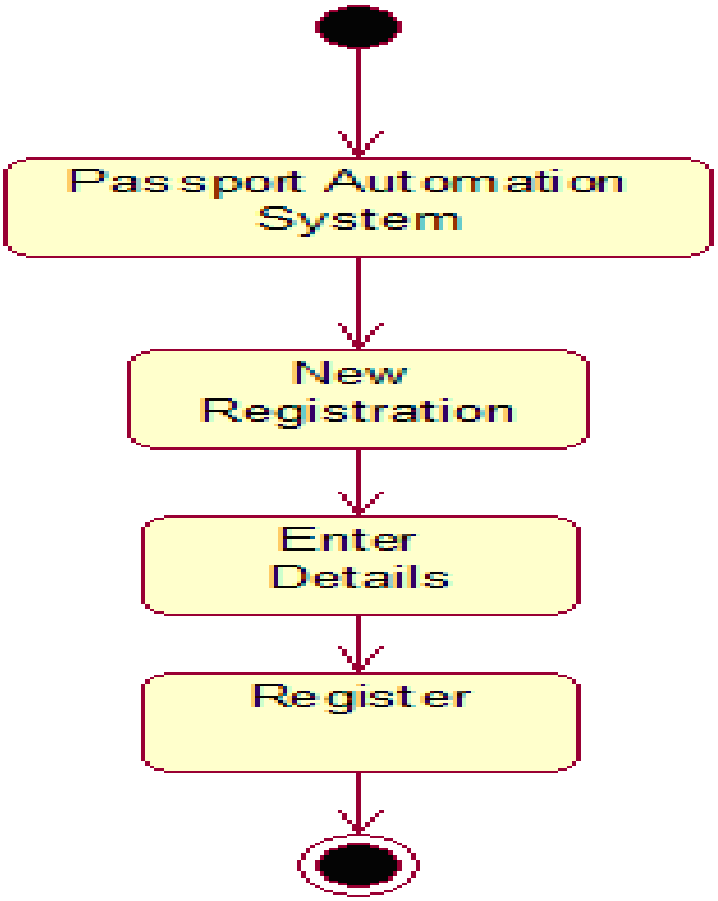
System Requirements

Software Requirements

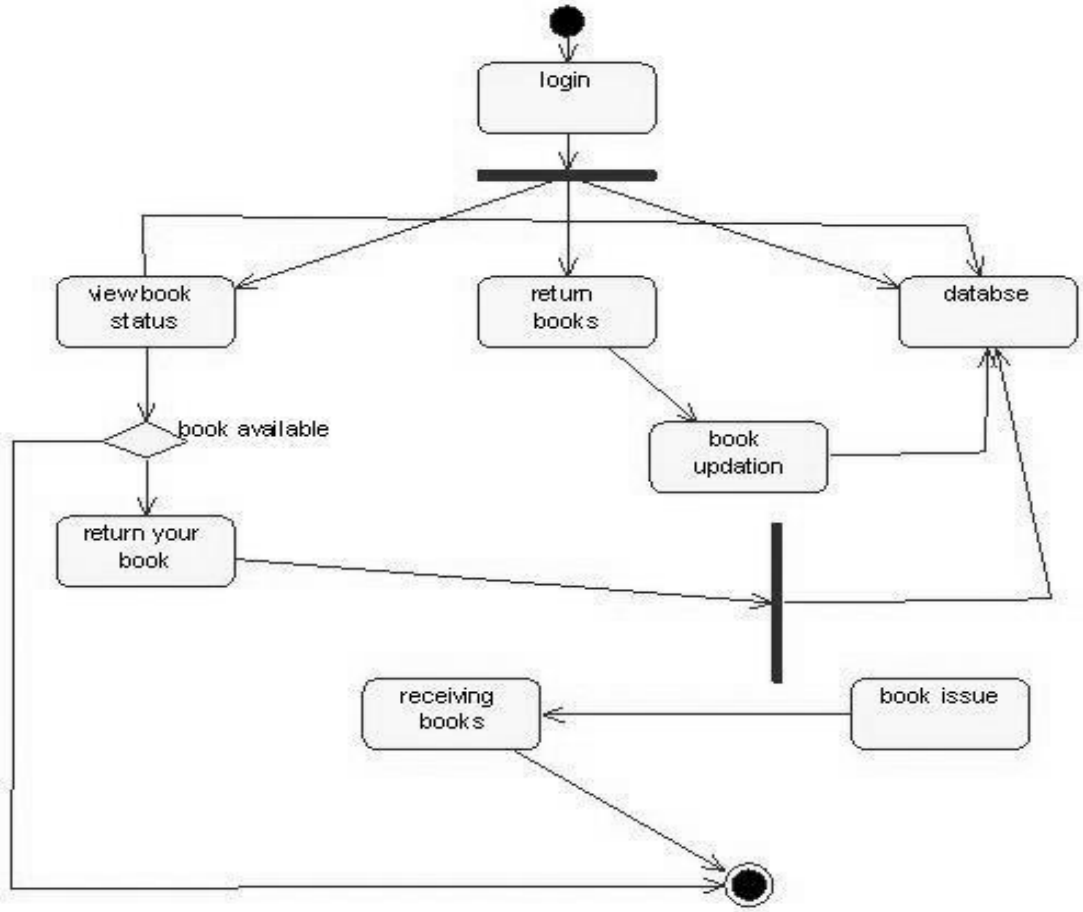
3. DESIGN

- Passport Automation System
- Book bank management system
- Online course reservation system
- Foreign trading system
- Conference Management System
- BPO Management System

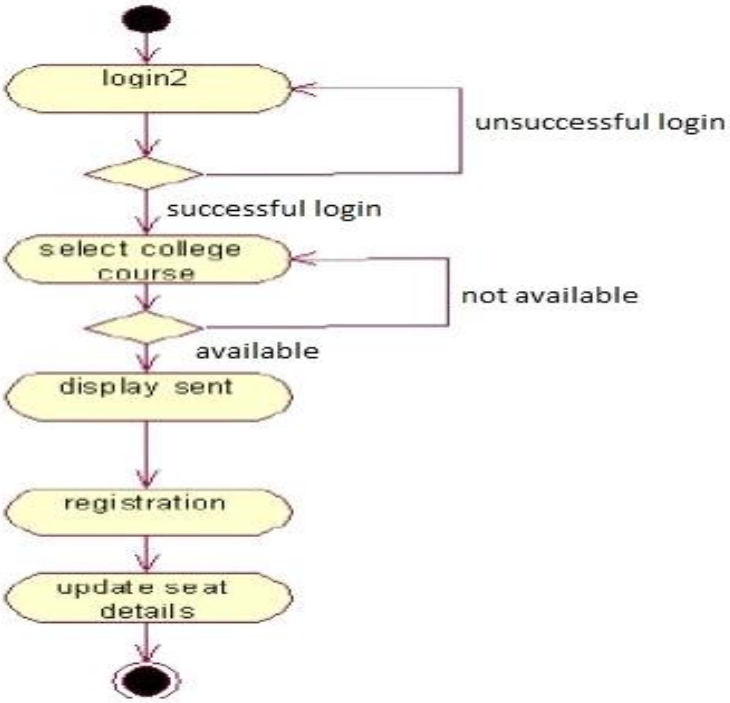
PASSPORT AUTOMATION SYSTEM:



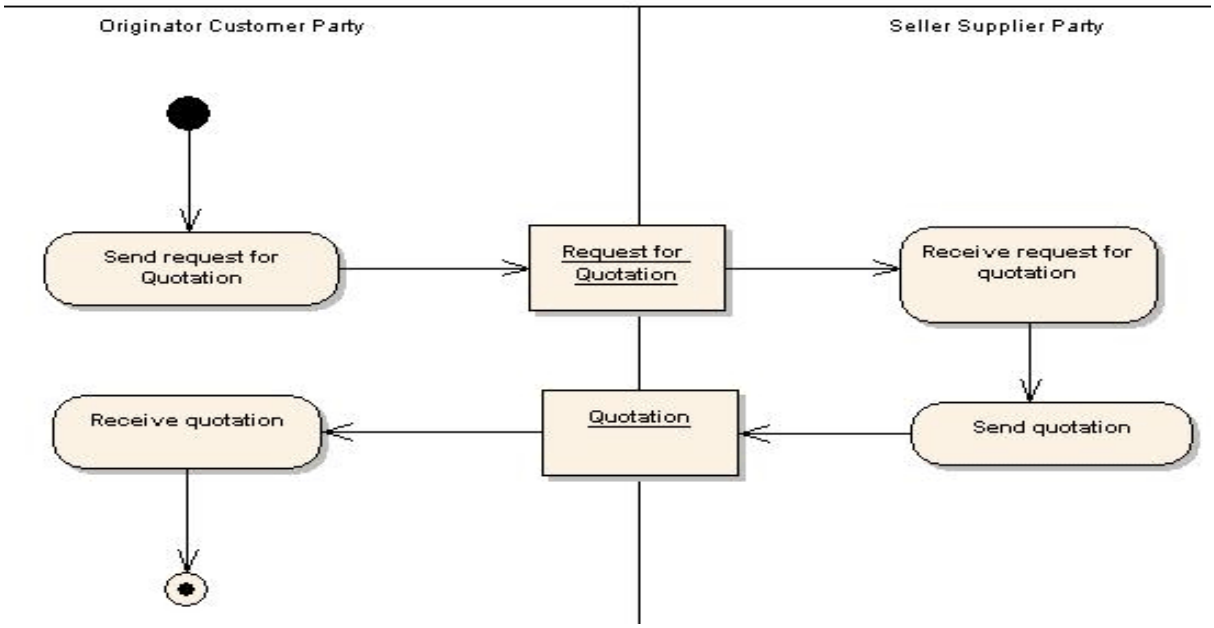
BOOK BANK MANAGEMENT SYSTEM:



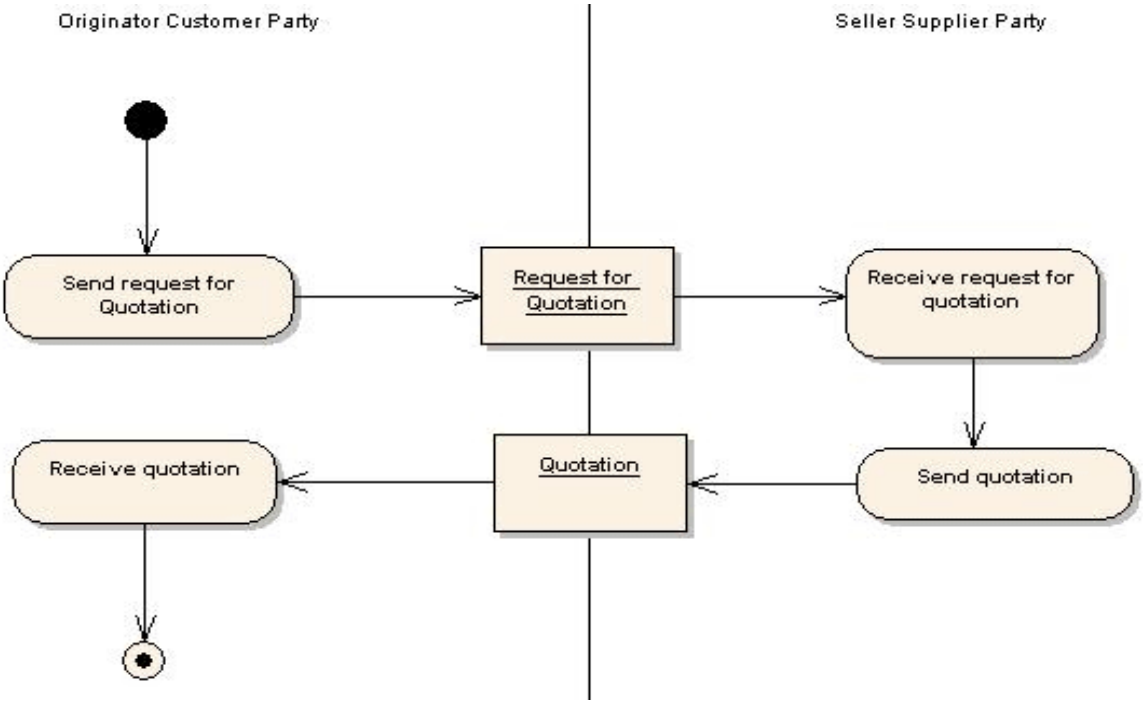
Online course reservation system



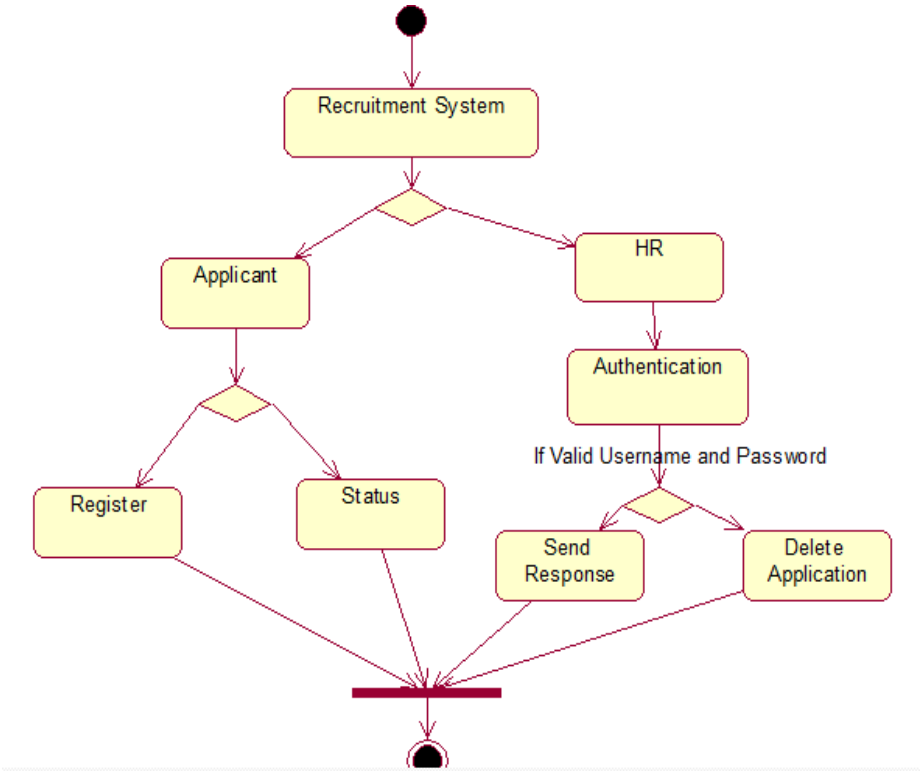
FOREIGN TRADING SYSTEM



CONFERENCE MANAGEMENT SYSTEM



BPO MANAGEMENT SYSTEM



WEEK-4

DOMAIN MODEL

1. ANALYSIS

Identifying the Classes Identifying the Objects

2. REQUIREMENTS

System Requirements Software Requirements

3. DESIGN

Identity the conceptual classes and Develop a domain model with UML Class diagram for passport automation system

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 reduces the complexities involved in it to the maximum possible extent.

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.

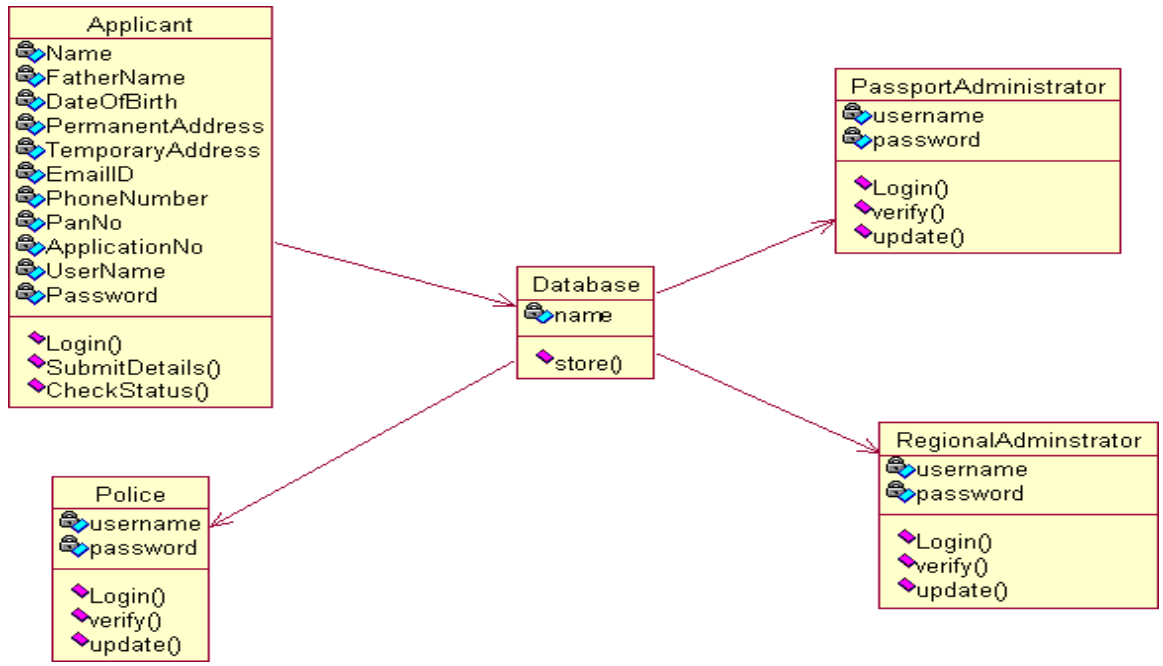
SCOPE

- The System provides an online interface to the user where they can fill in their personal details
- 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.

CLASS DIAGRAM

A class is drawn as rectangle box with three compartments or components separated by horizontal lines. The top compartment holds the class name and middle compartment holds the attribute and bottom compartment holds list of operations.

CLASS DIAGRAM FOR PASSPORT AUTOMATION SYSTEM



Documentation of Class Diagram:

Applicant-The applicant has attribute such as name and password and operations are login, givedetails and logout. The applicant login and fill the details that are required for applying the passport .After applying the person can view the status of the passport verification process.

The Database-The database has attributed such as name and operation is store. The purpose is to store the data.

Regional Administrator- The regional administrator has attribute such as name and operation are get details, verify details and send. The regional administrator get the details form database and verify with their database

Passport Administrator-The passport administrator has attributed such as name and operation are get details, verify details and issue. The passport administrator get the details form database and verify with their database, update the verification and issue the passport

The Police-The police has attribute such as name and operation are get details, verify details and send. The police get the details form database and verify with their database, update the verification in the database

WEEK-5

SCENARIOS

Using the identified scenarios find the interaction between objects and represent them using UML Interaction diagrams.

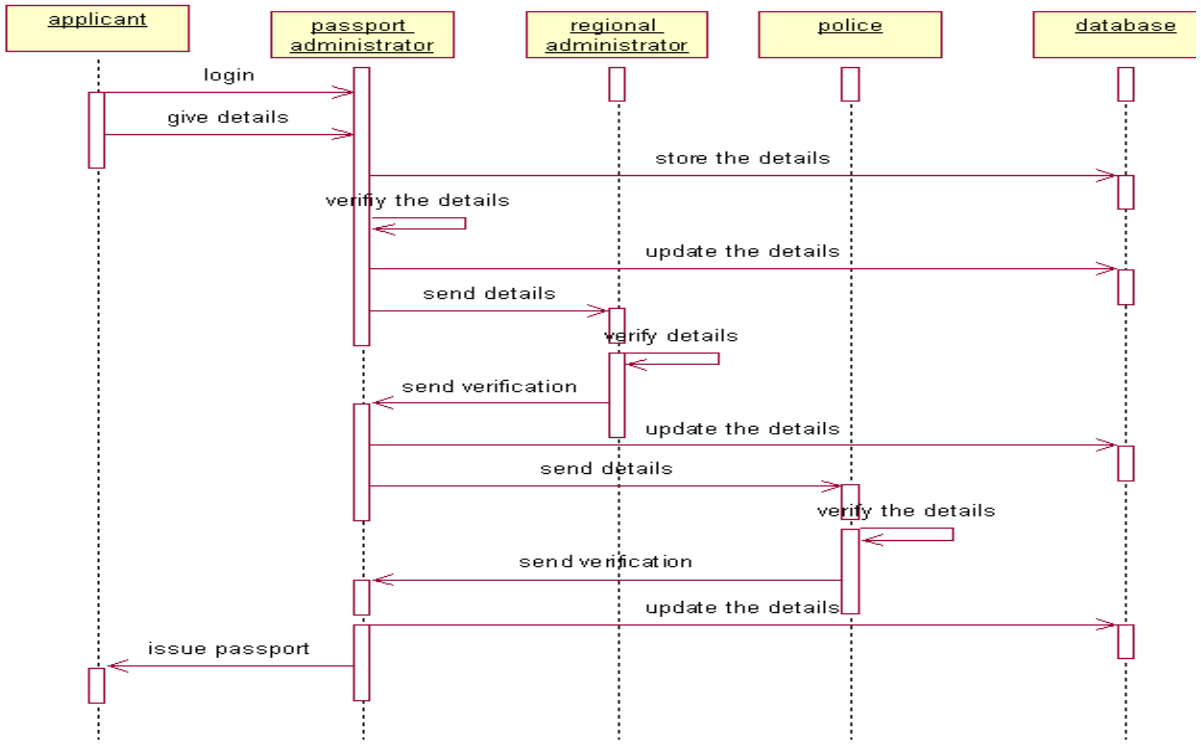
Both sequence diagrams and collaboration diagrams are kinds of interaction diagrams. Interaction diagrams address the dynamic view of a system. A sequence diagram is an interaction diagram that emphasizes the time-ordering of messages. It depicts the objects and classes involved in the scenario and the sequence of messages exchanged between the objects needed to carry out the functionality of the scenario. Typically, you'll use one sequence diagram to specify a use case's main flow, and variations of that diagram to specify a use case's exceptional flows.

Sequence Diagram

A sequence diagram shows an interaction arranged in time sequence,

It shows object participating in interaction by their lifeline by the message they exchange arranged in time sequence. Vertical dimension represent time and horizontal dimension represent object.

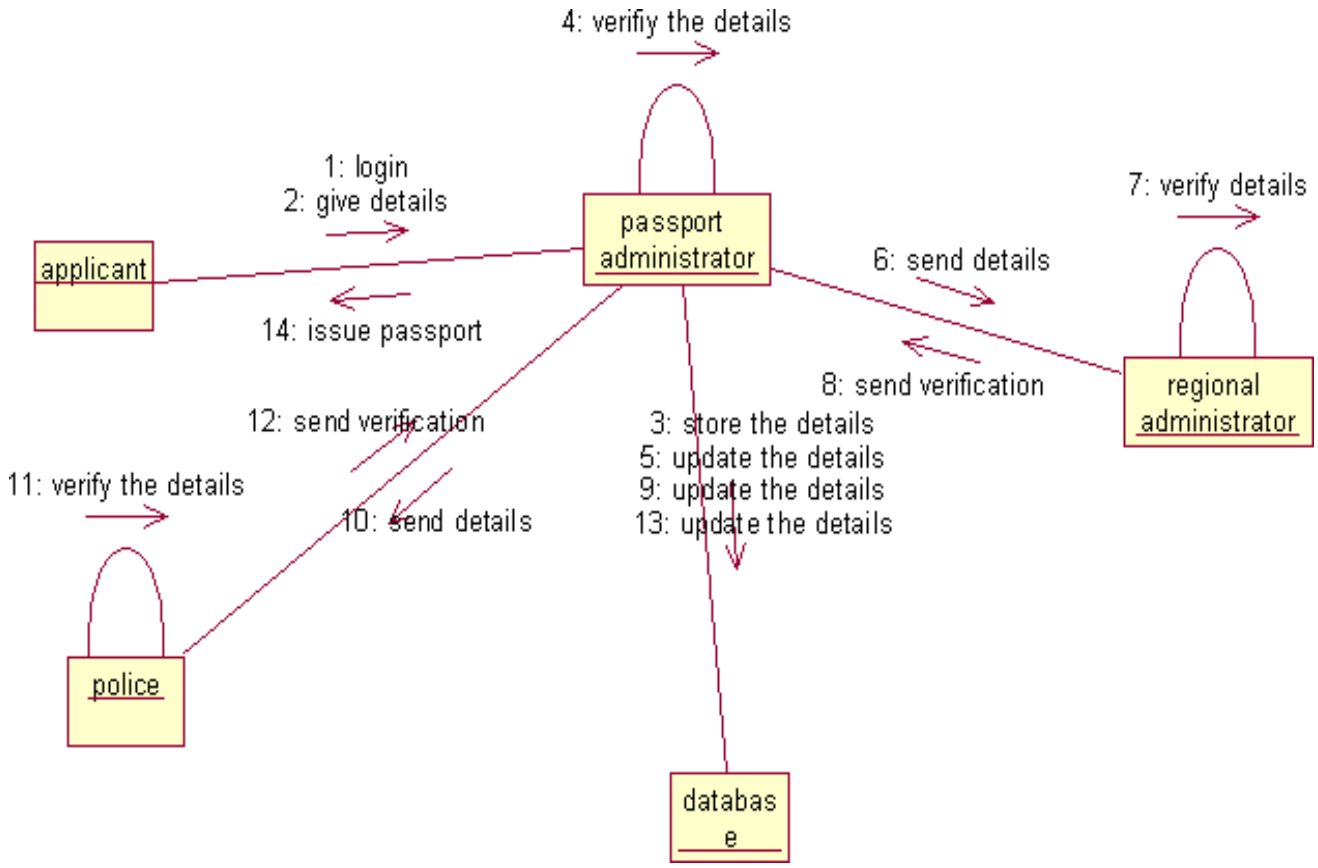
Example: Sequence Diagram for Passport automation system



COLLABORATION DIAGRAM

A collaboration diagram is similar to sequence diagram but the message in number format. In a collaboration diagram sequence diagram is indicated by the numbering the message. A collaboration diagram, also called a communication diagram or interaction diagram, A sophisticated modeling tool can easily convert a collaboration diagram into a sequence diagram and the vice versa. A collaboration diagram resembles a flowchart that portrays the roles, functionality and behavior of individual objects as well as the overall operation of the system in real time.

Example: Collaboration Diagram for Passport automation system



WEEK-6

STATE CHART DIAGRAMS

1. ANALYSIS

Identifying the States

Identifying the

2. REQUIREMENTS

System Requirements

Software Requirements

3. DESIGN

- Passport Automation System
- Book bank management system
- Online course reservation system

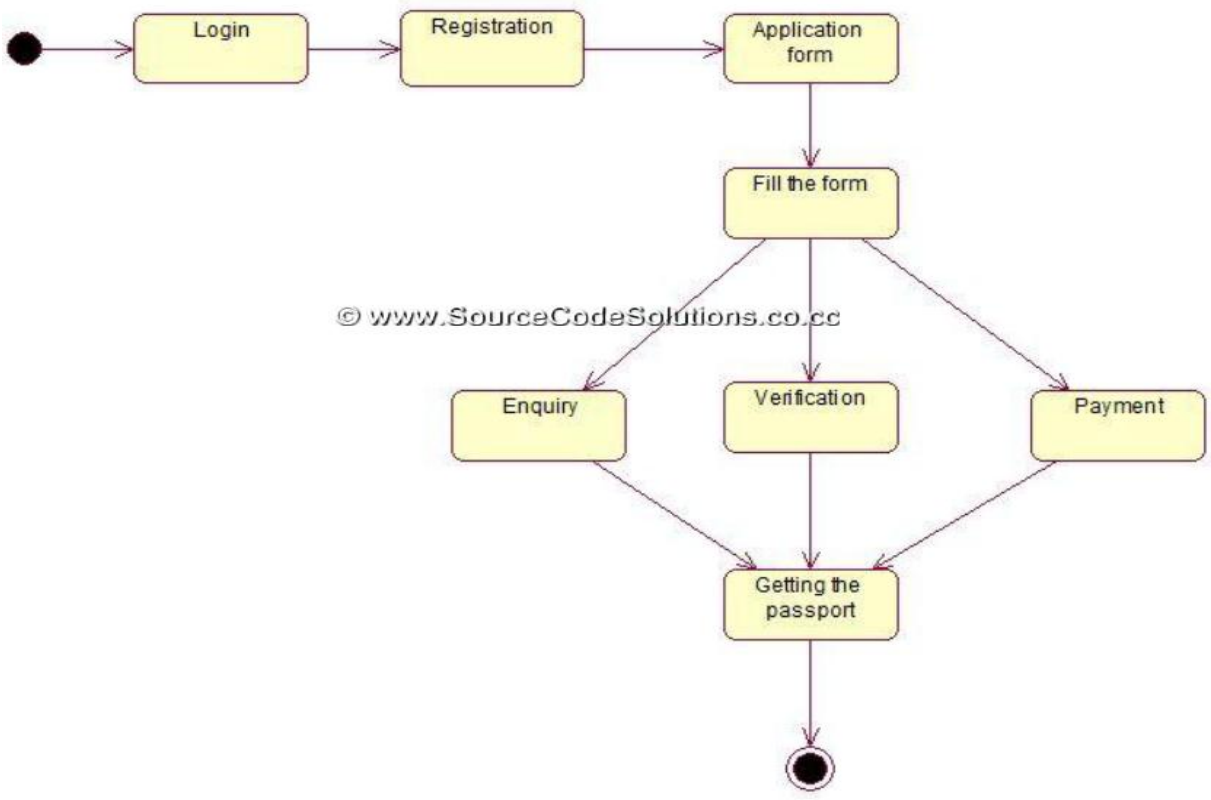
State chart Diagram: The state chart diagram contains the states in the rectangle boxes and starts in indicated by the dot and finish is indicated by dot encircled. The purpose of state chart diagram is to understand the algorithm in the performing method.

Documentation of State Chart Diagram

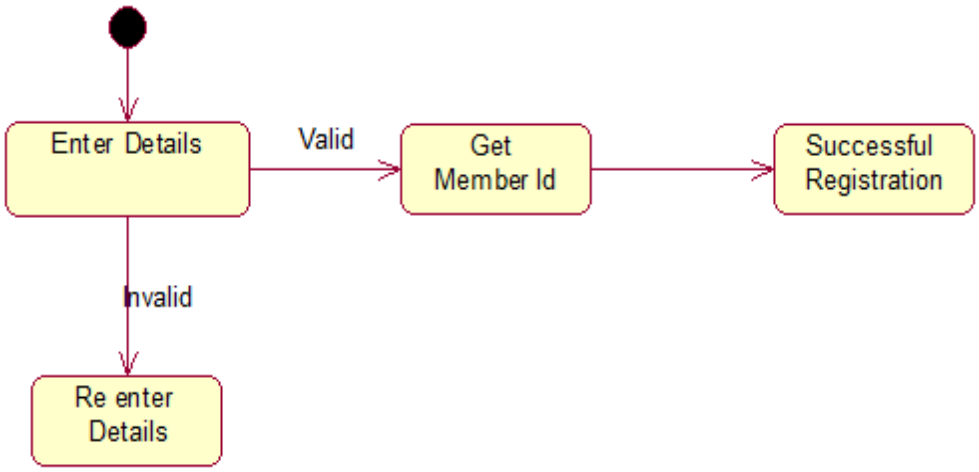
- The states of the passport automation system are denoted in the state chartdiagram
- Login state represent authentication for login the passport automationsystem.
- In this state, it checks whether the applicant has provided all the details that isrequired.

Police, regional administrator and passport administrator get necessary details and verification of the applicant are denoted from the Get detail state and verificationstate.

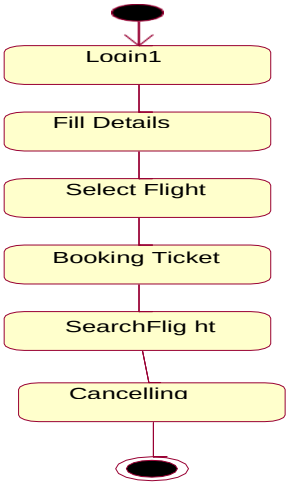
Passport Automation System



Book Bank Management System



Online Course Reservation System



WEEK-7

STATE CHART DIAGRAMS

1. ANALYSIS

Identifying the States

Identifying the

2. REQUIREMENTS

System Requirements

Software Requirements

3. DESIGN

- Foreign trading system
- Conference Management System
- BPO Management System

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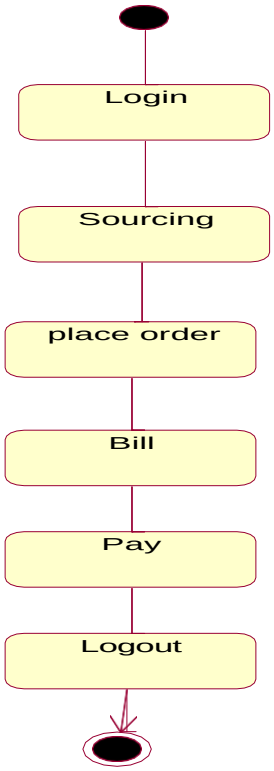
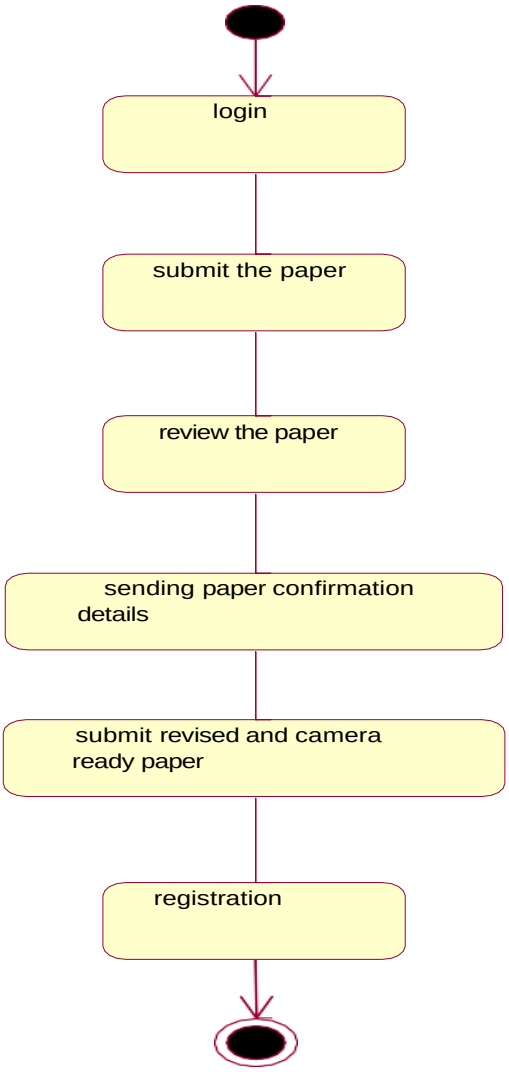
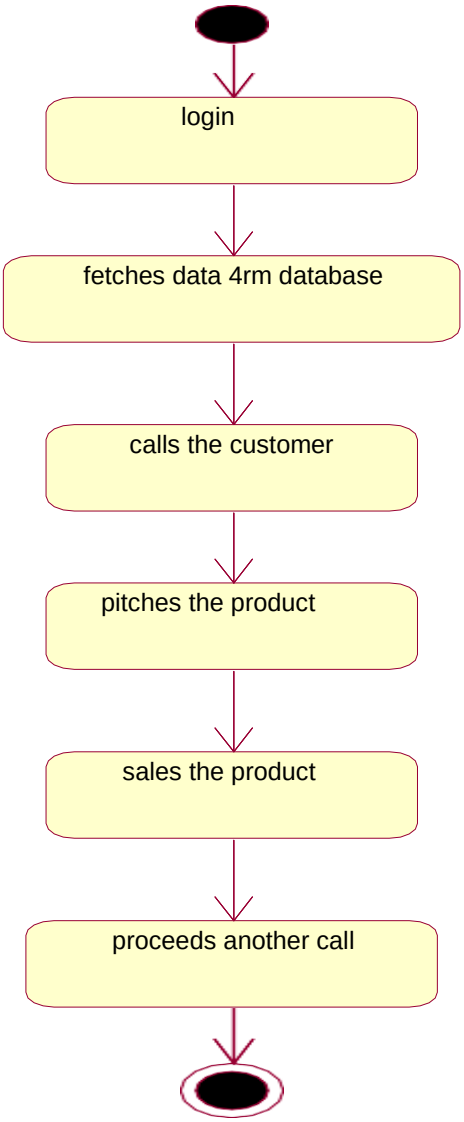
Foreign Trading System



Conference Management System



BPO Management System



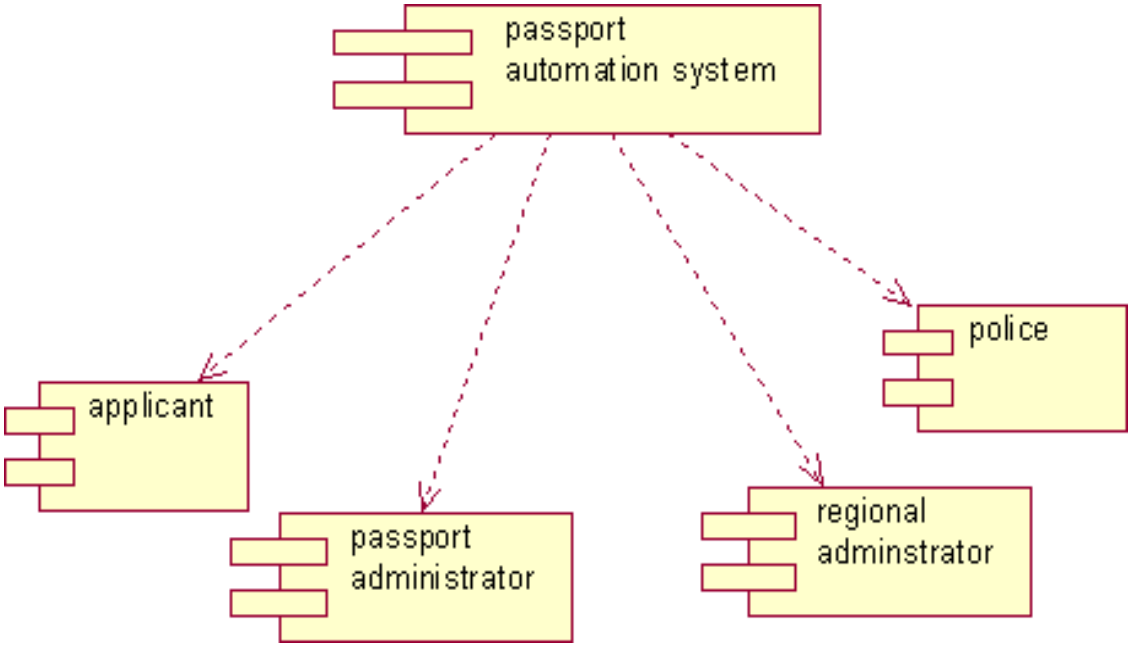
Week-8

COMPONENT DIAGRAM

- Passport Automation System
- Book bank management system
- Online course reservation system

Component diagram. The component diagram is represented by figure dependency and it is a graph of design of figure dependency. The component diagram's main purpose is to show the structural relationships between the components of a systems. It is represented by boxed figure. Dependencies are represented by communication association.

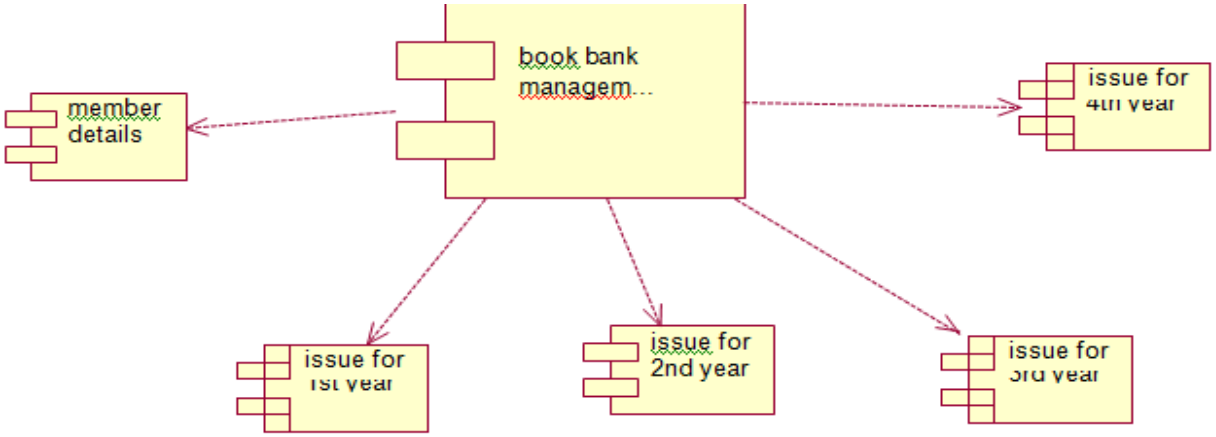
Passport Automation System



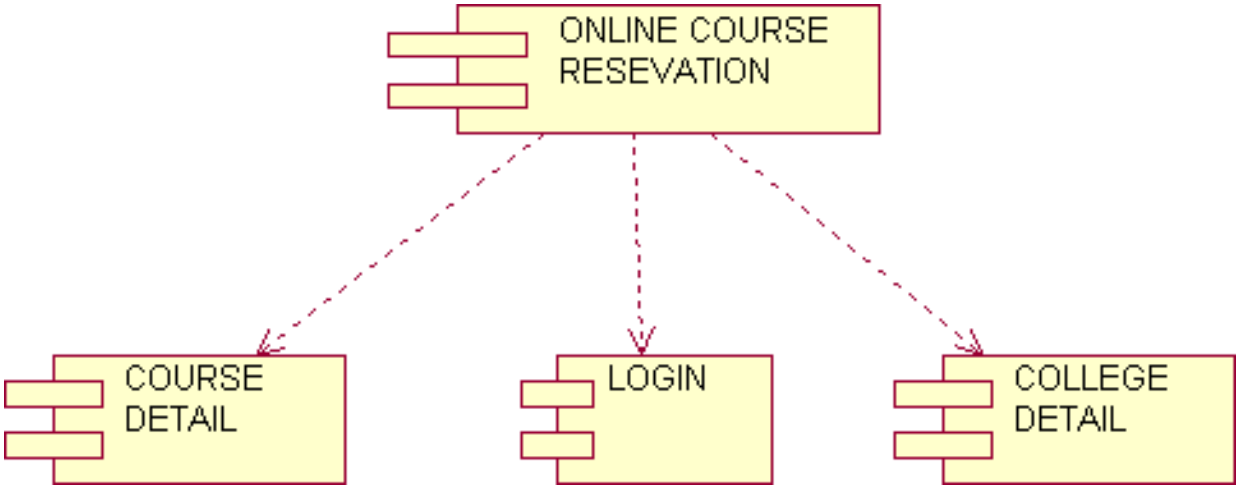
Book Bank Management System:

Documentation of Component Diagram

The main component in this component diagram is online book bank management systems. And member details, issue for first year, issue for second year issue for third year and issue for fourth year are components comes under the main component.



Online Course Reservation System



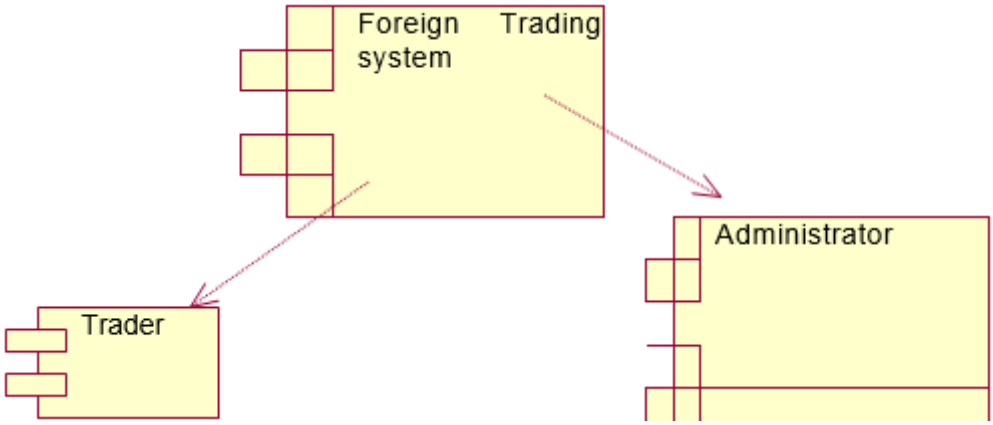
Week-9

COMPONENT DIAGRAM

Draw a Component diagram for
a. Foreign trading system
b. Conference Management System
c. BPO Management System
Foreign Trading System

Documentation Of Component Diagram

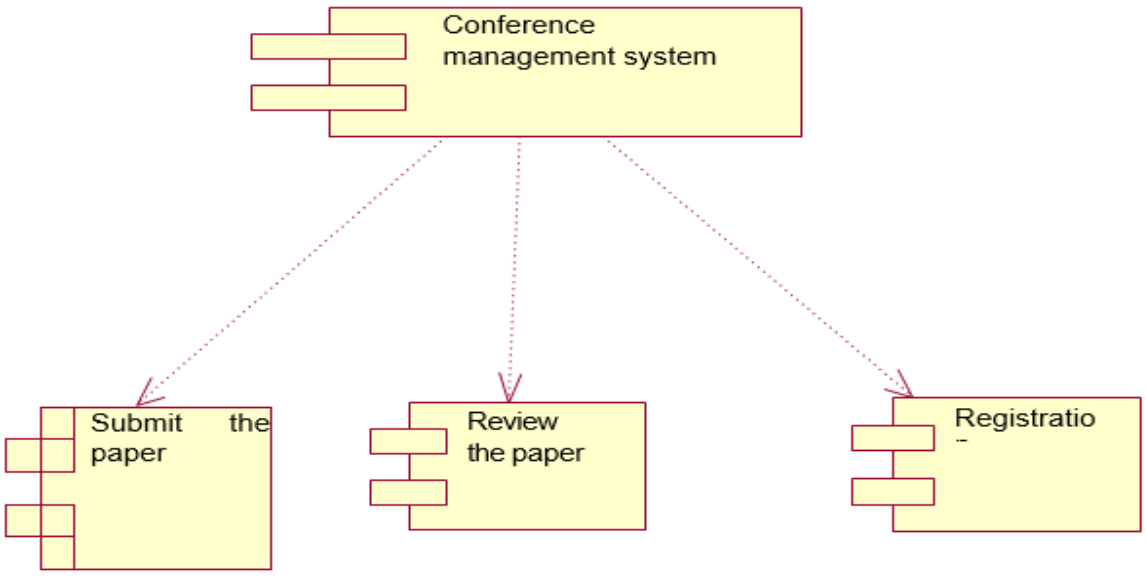
The main component in the component diagram is foreign trading system. The trader who come to do the trading process and administrator who manages all the other processes is the subcomponents.



Conference Management System

Documentation of Component Diagram

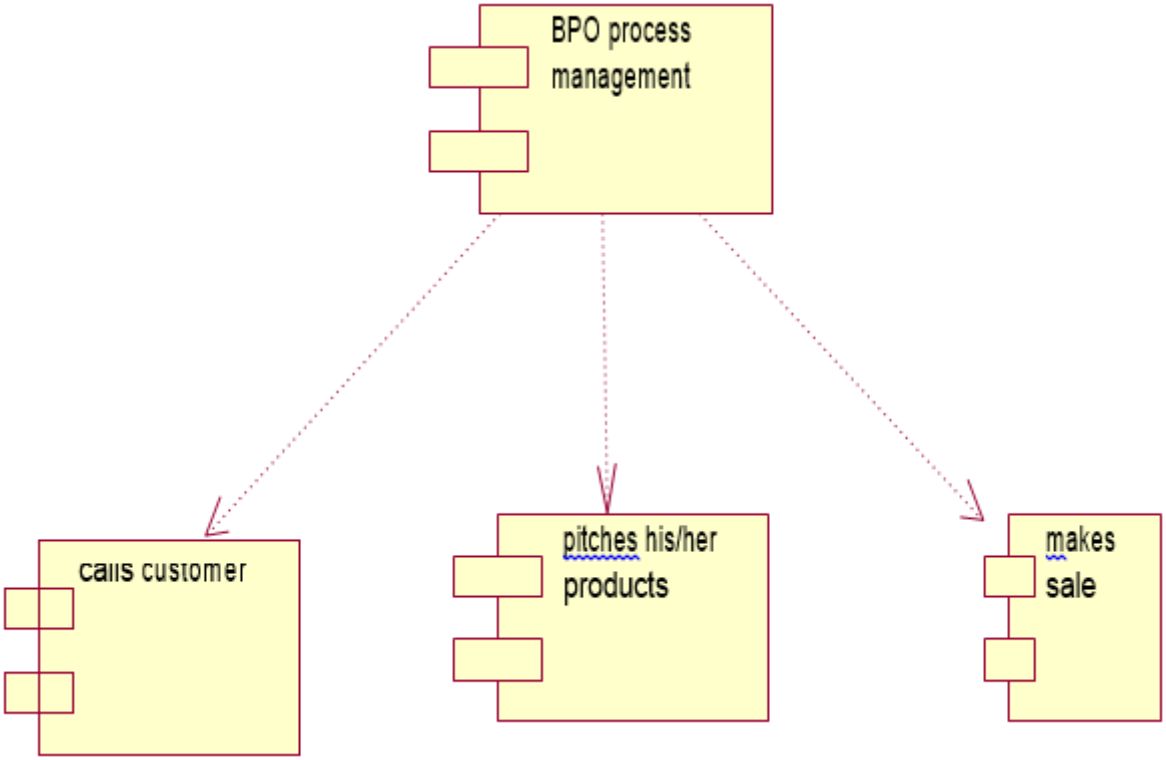
The main component in this component diagram is conference management system and submit the paper, review the paper and registration.



BPO Management System

Documentation of Component Diagram

The main component in this component diagram is BPO management systems. And the agent calls customer, pitches about his product and makes the sale are the main component comes under the componentdiagram.



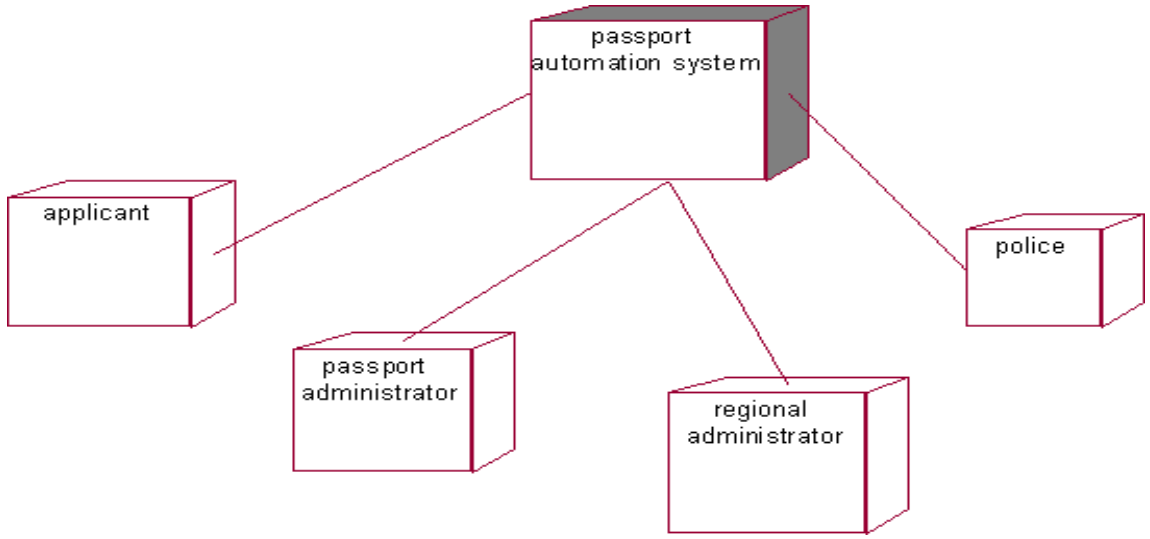
Week-10

DEPLOYMENT DIAGRAMS

a.Passport Automation System

Problem Analysis and Project Plan

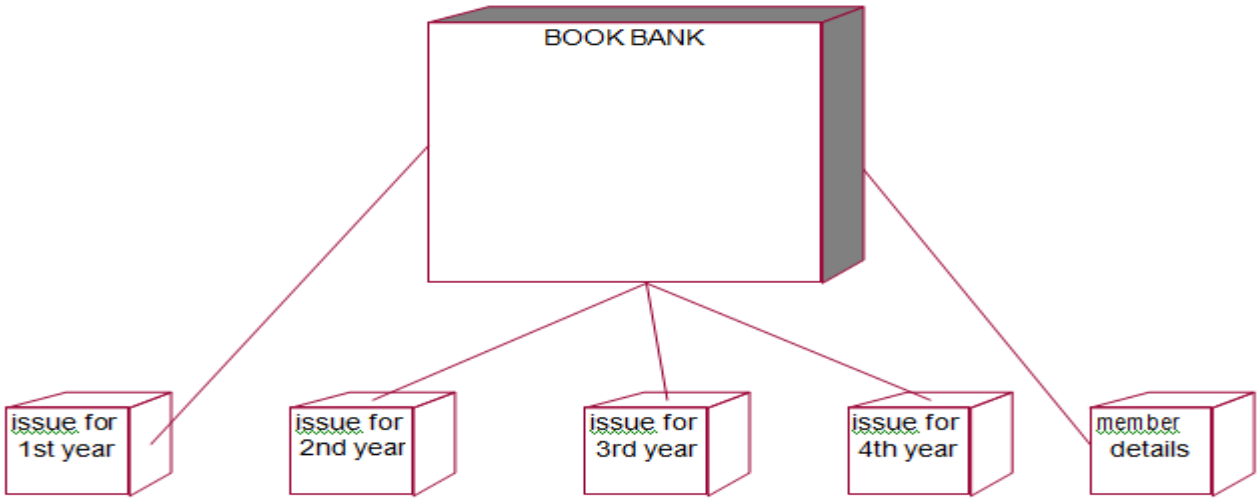
To simplify the process of applying passport, software has been created by designing through rational rose tool, using visual basic as a front end and Microsoft access as a back end. Initially the applicant login the passport automation system and submits his details. These details are stored in the database and verification process done by the passport administrator, regional administrator and police the passport is issued to theapplicant.



Documentation of Deployment Diagram

The device node is passport automation system and execution environment node are applicant passport administrator, regional administrator, and police.

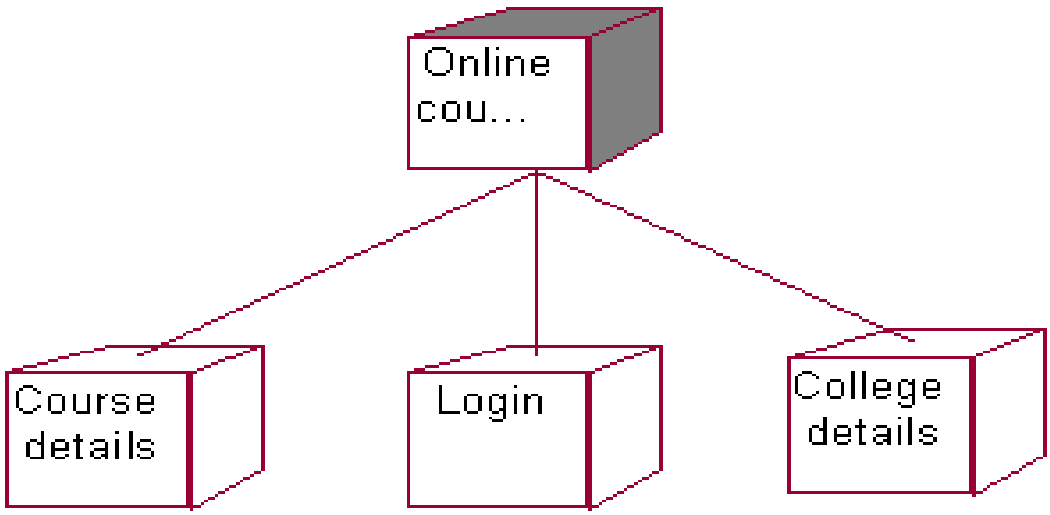
b. Book bank management system



Documentation Of Deployment Diagram

The processor in this deployment diagram is the book bank which is the main part and which are the some of the main activities performed in the system. And issue for first year, issue for second year issue for third year and issue for fourth year are some activities performed in this system.

C. Online course reservation system



Documentation Of Deployment Diagram

The device node is online course reservation and execution nodes are course details, login and college details

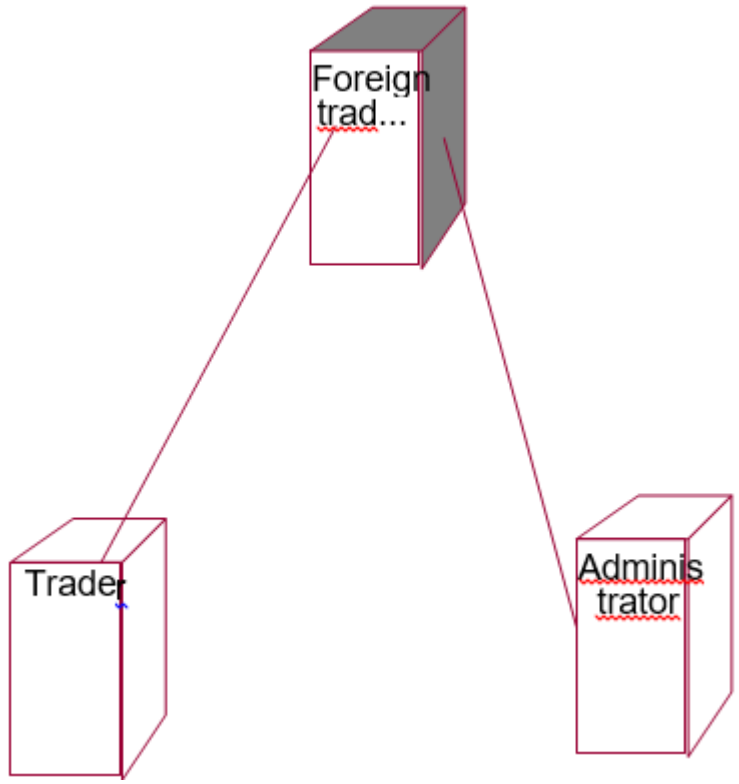
Week-11

DEPLOYMENT DIAGRAMS

Draw a Deployment diagram for

a. Foreign trading system
b. Conference Management System
c. BPO Management System

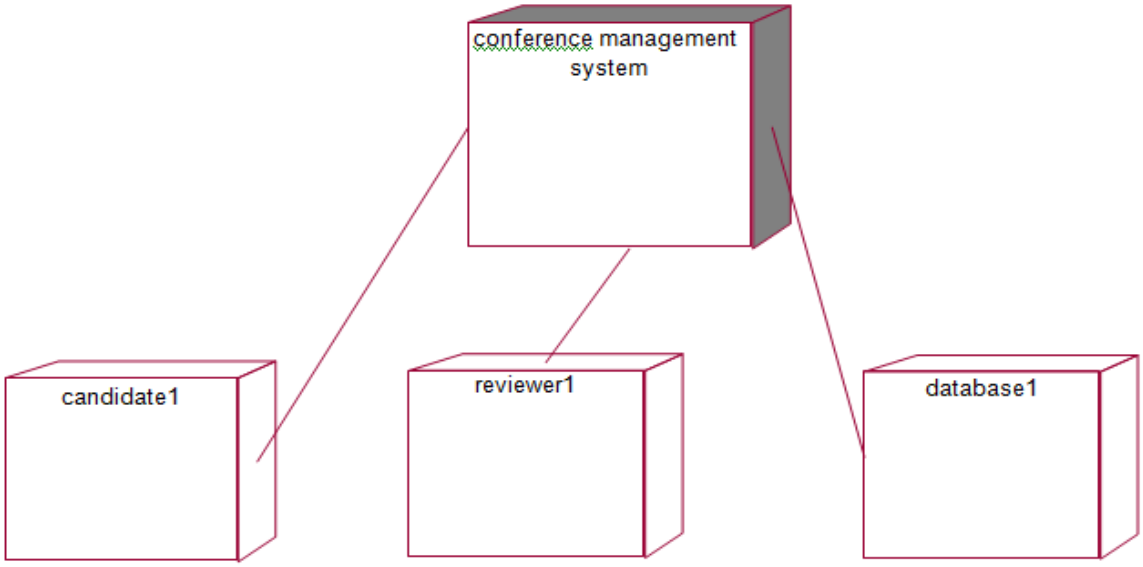
a. Foreign trading system



Documentation of Deployment Diagram

The processor in this diagram is the foreign trading system. The devices are the trader and administrator who perform the main activities in the system.

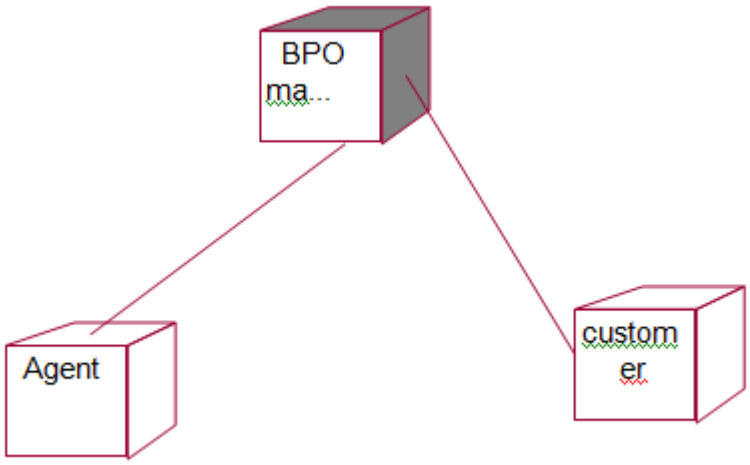
b. Conference Management System



Documentation Of Deployment Diagram

The processor in this deployment diagram is the conference management system which is the main part and the devices are the candidate, appear for do conference , reviewer will reviews paper , database will store all details which are the some of the main activities performed in the system.

C.BPO Management System



Documentation Of Deployment Diagram

The processor in this deployment diagram is the BPO management system which is the main part and the devices are the agent, customer and to sell the product to the customer are the main activities performed in the system.