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SE Adv Practical-4

Pre-Lab Task:

1) Which of the following diagram is time oriented?

- **A) Collaboration**
- **B) Sequence**
- **C) Activity**
- **D) None of the**

Ans: Option b
Explanation: A sequence diagrams timeline along which tasks are completed.

2) which diagram is used to show interactions between messages are classified as?

- **A) activity**
- **B) state chart**
- **C) collaboration**
- **D) object lifeline**

Ans: Option c

3) Which two terms combined give the name Interaction Diagram?

Ans: Sequence diagram and Collaboration diagram

4) Which UML diagrams has a static view.
Ans: USECASE Diagram

5) Which diagram in UML shows a complete of a modeled system at a specific time.

- **A) Sequence**
- **B) Collaboration**
- **C) Class**
- **D) Object**

Ans: Option d
Explanation: An object diagram focuses on some particular set of object instances and attributes, and the links between the instances. It is a static snapshot of a dynamic view of the system.

In Lab:

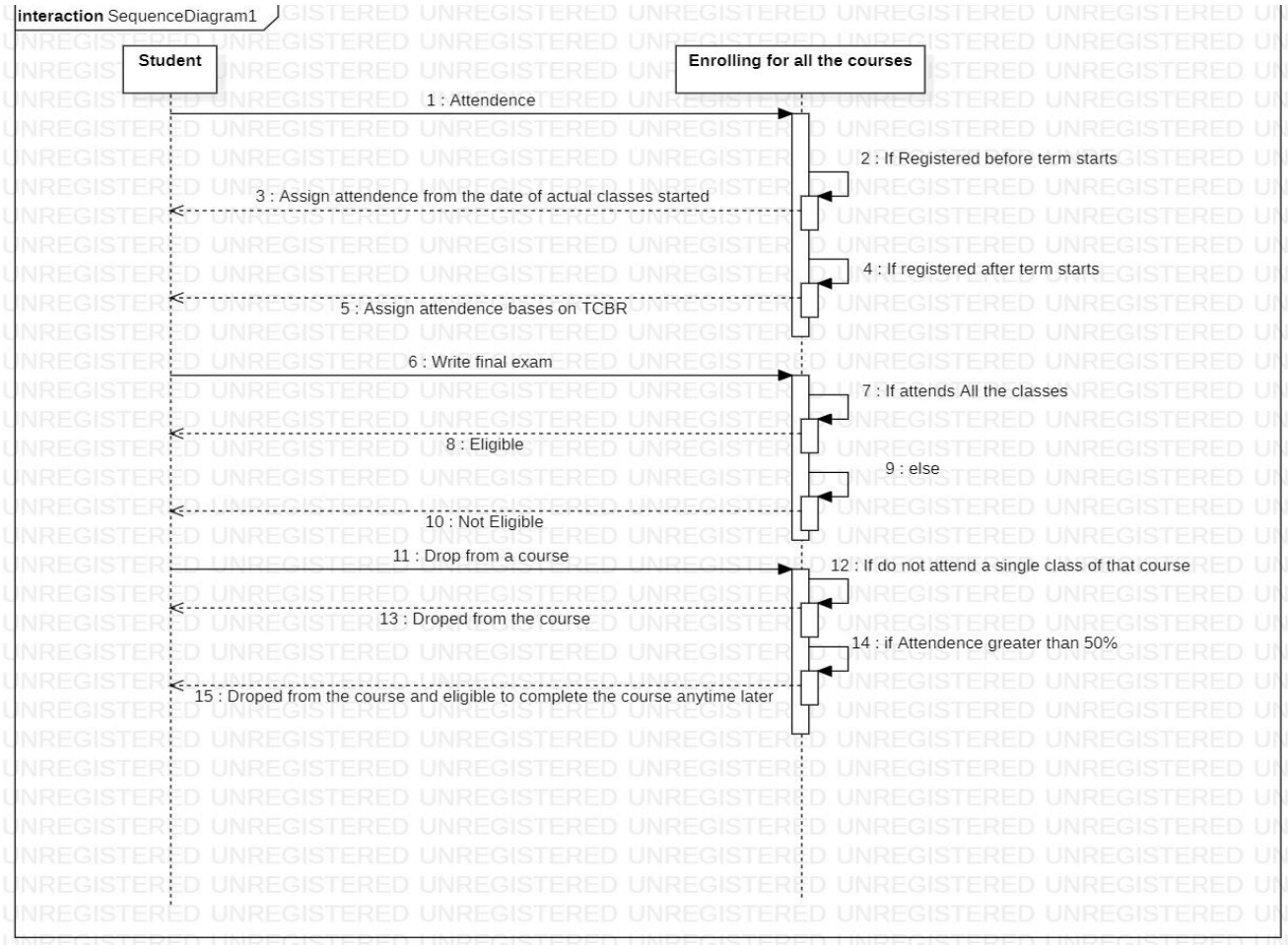
1) Draw a Sequence and state chart diagram on "A student who is enrolling for all the courses in a semester". The conditions for drawing the state chart diagram are as follows:

a. **If the student gets enrolled before the term starts, then he should be taught (by taking classes) in time and consider the attendance from the actual date of the beginning of the course. Otherwise, the attendance should be considered from when he registers, based on the TCBR (total classes before registration) .**
b. **After attending all the classes and completing the course, the student is eligible to write the final exams.**
c. **If a student decides to leave the course in middle, he has 2 options**

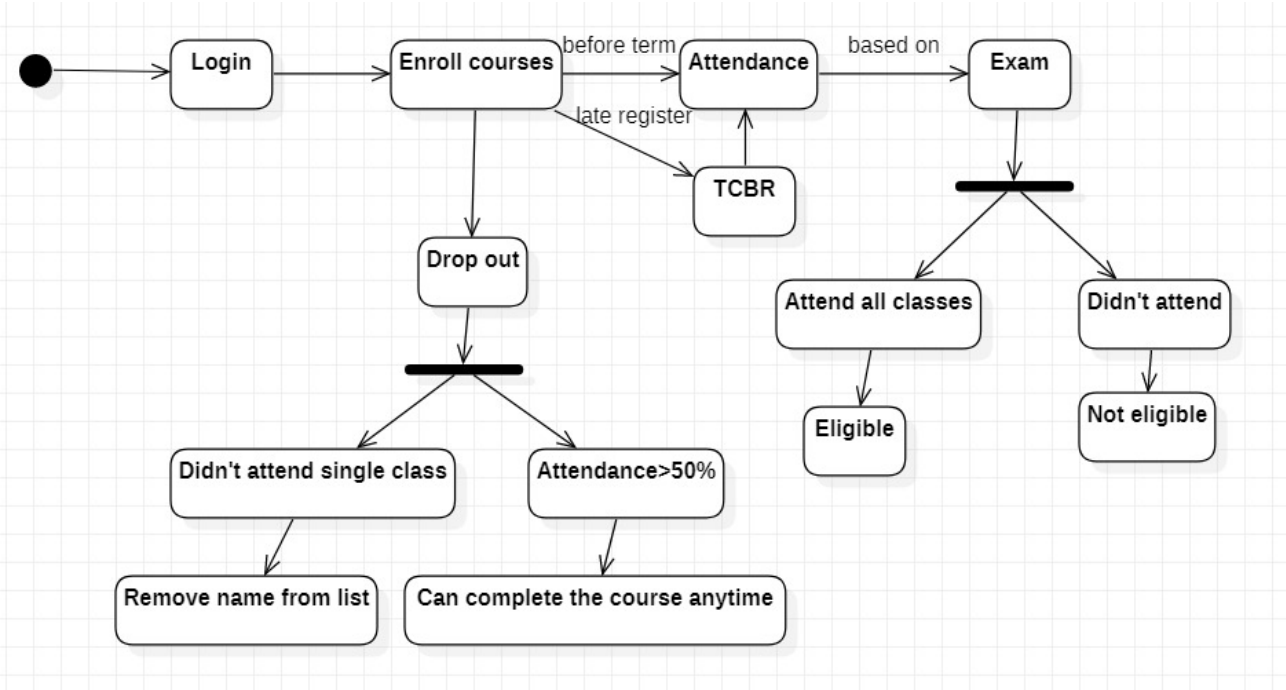
C1: - If he did not attend even a single class, then his name should be removed from the list

C2: - If his attendance criteria are greater than 50%, then he should be eligible to attend the classes (be taught) again, and complete the course any time later.

SEQUENCE DIAGRAM:



STATE CHART DIAGRAM:



Post Lab:

1) What are the basic elements of an Activity Diagram?

Ans:

- **Action:** A step in the activity wherein the users or software perform a given task. In Lucidchart, actions are symbolized with round-edged rectangles.
- **Decision node:** A conditional branch in the flow that is represented by a diamond. It includes a single input and two or more outputs.
- **Control flows:** Another name for the connectors that show the flow between steps in the diagram.
- **Start node:** Symbolizes the beginning of the activity. The start node is represented by a black circle.
- **End node:** Represents the final step in the activity. The end node is represented by an outlined black circle.

2) What are the different views in UML?

Ans:

1) The user view

2) The structural view

3) The behavioural view

4) The implementation view.

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SE Adv Practical-5

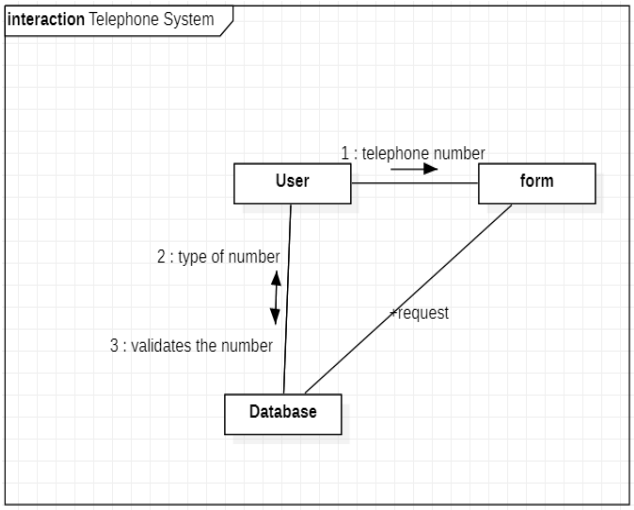
Pre-lab:

1) What is a collaboration diagram? Explain the steps to design a Telephone System using collaboration diagram.

Ans: -

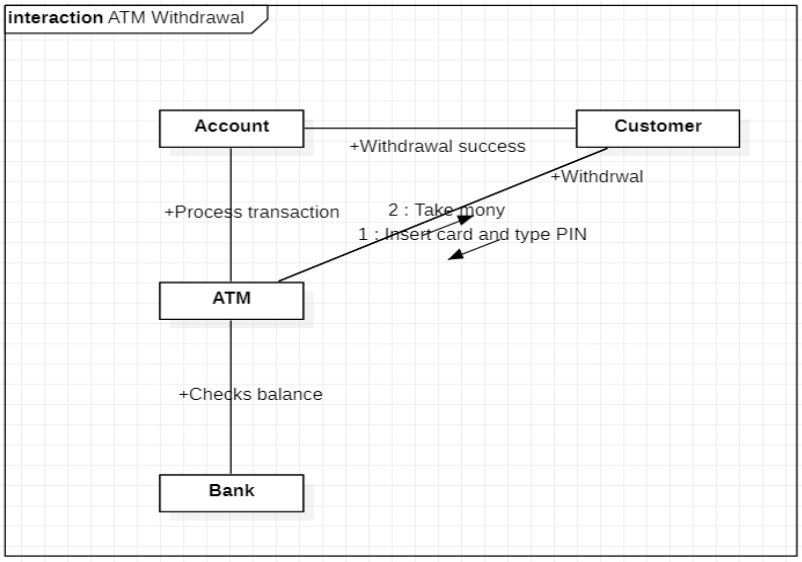
A collaboration diagram, also called a communication diagram or interaction diagram, is an illustration of the relationships and interactions among software objects in the Unified Modeling Language (UML).

Telephone System using collaboration diagram.



2) Draw a collaboration diagram on verifying the ATM pin, where the objects are customer, card reader, customer console, bank database.

Ans: -

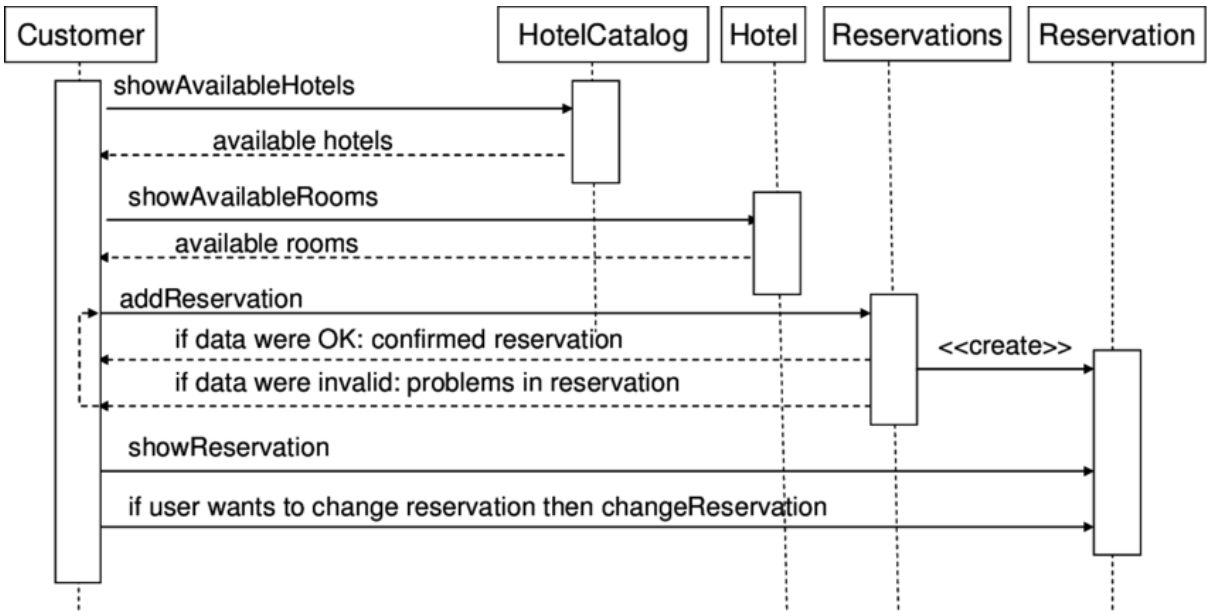


3) What is meant by Sequence diagram? How do you create sequence diagram for Hotel Reservation?

Ans: -

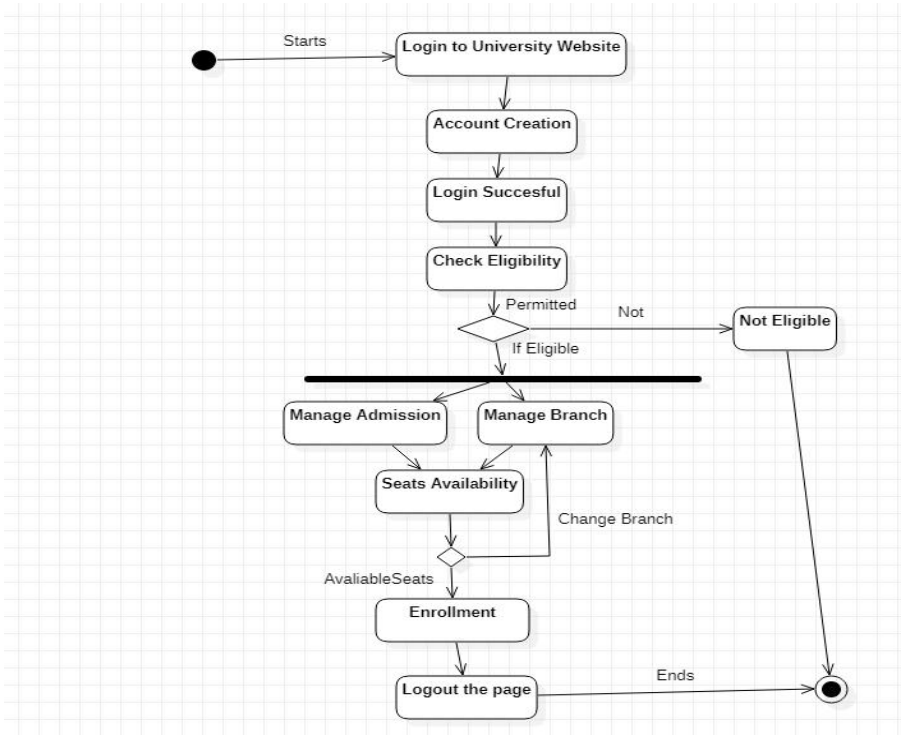
A sequence diagram is a visual model describing how groups of objects collaborate in some behavior over time by capturing the behavior of a scenario of a use case. It shows objects and the messages that are passed between these objects for the particular collaboration.

Sequence diagram for Hotel Reservation



4) Develop an activity diagram for University Registration process.

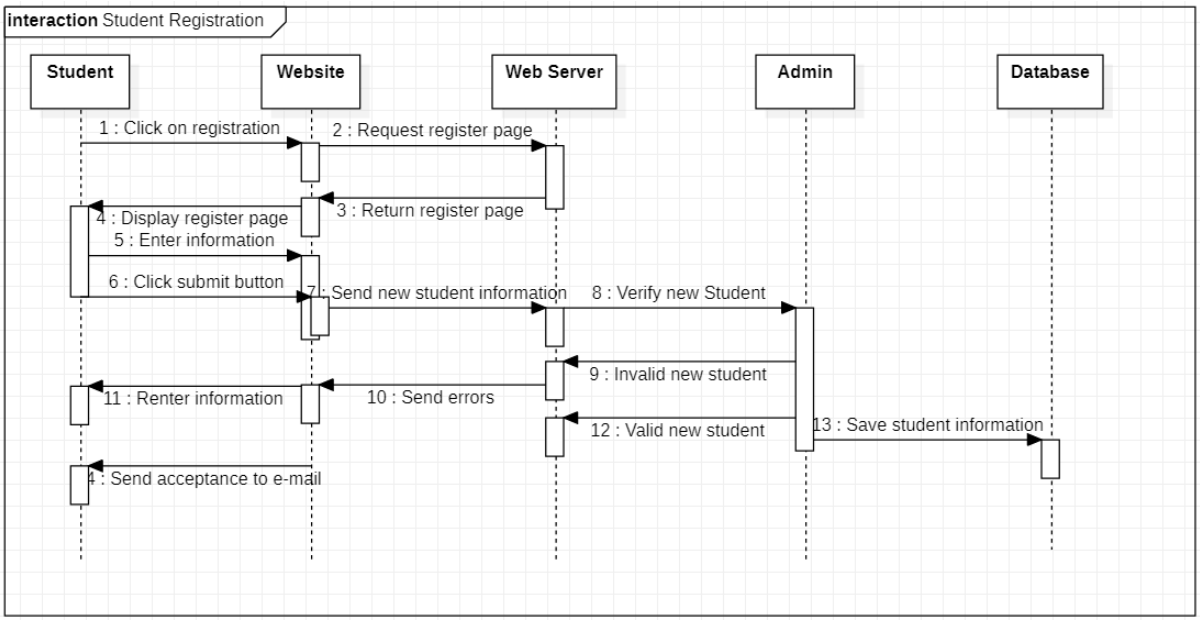
Ans: -



In-lab:

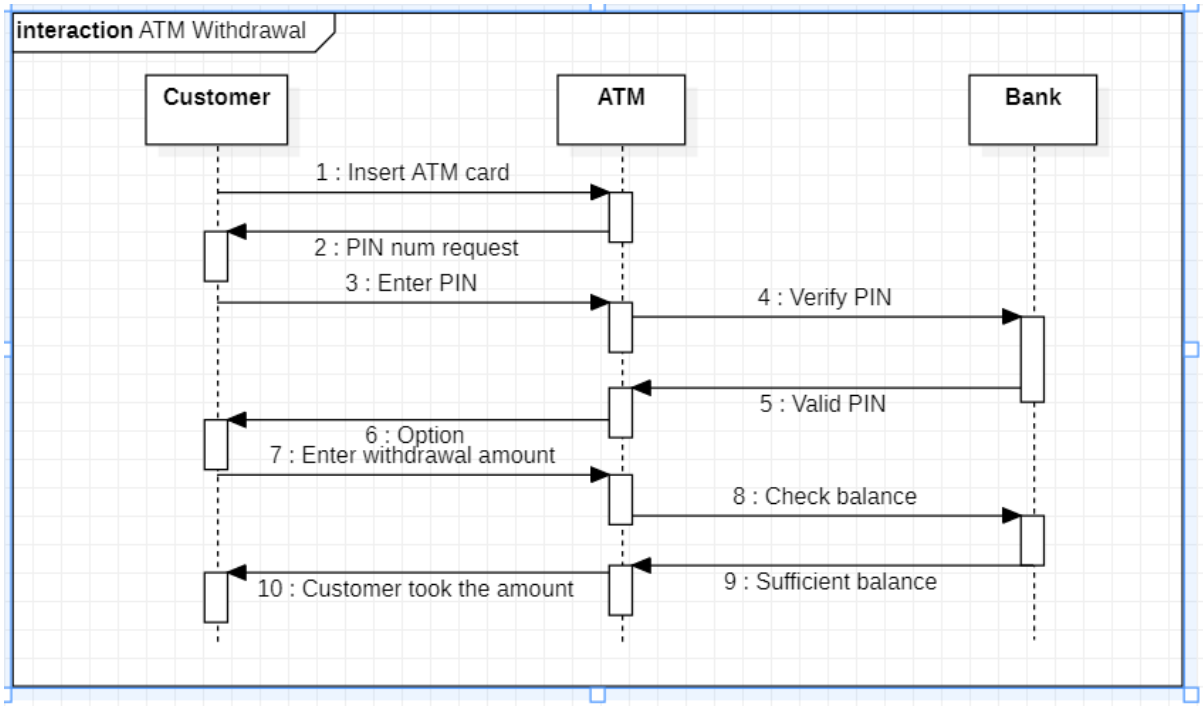
1.Prepare a sequence diagram for online exam registration system. The main scope of this system is used for testing the applicant's individual capacity and ability. Also, the user can register him by going through the various details and regarding the exam of his/her choice. If the applicant is not eligible for an exam, the software provides an option by giving a list of other available examinations.

Ans:Sequence diagram of student registration:



2) A New method was introduced to make transactions easier without approaching the Cashier [Bank] directly. Mr. Khan wanted to know the process behind the new methodology. Kindly explain in detail about the interaction that happens at an ATM & the parts involved in the transaction, to Mr. Khan, as you are the developer of the project.

Ans:Squence diagram of ATM Withdrawal



Post Lab:

1.What are the various components in sequence diagrams?

Ans:-

Basic Sequence Diagram Notations

- Class Roles or Participants.
- Activation or Execution Occurrence.
- Messages.
- Lifelines.
- Destroying Objects.
- Loops.
- Synchronous Message.
- Asynchronous Message.

2.What are the different views in UML?

Ans: - The major views of the system that UML supports are: 1) the user view, 2) the structural view, 3) the behavioral view, and 4) the implementation view. One or more diagrams for each view is defined by the UML and each provides a unique window into the system.

3.State the differences between Activity and Sequence Diagram.

Ans :-

SEQUENCE DIAGRAM	ACTIVITY DIAGRAM
1.The Sequence diagram represents the UML, which is used to visualize the sequence of calls in a system that is used to perform a specific functionality.	1.The Activity diagram represents the UML, which is used to model the workflow of a system.
2.The Sequence diagram shows the message flow from one object to another object.	2.The Activity diagram shows the message flow from one activity to another.

SEQUENCE DIAGRAM	ACTIVITY DIAGRAM
3.Sequence diagram is used for the purpose of dynamic modelling.	3.Activity diagram is used for the purpose of functional modelling.
4.Sequence diagram is used to describe the behavior of several objects in a single use case	4.Activity diagrams is used to describe the general sequence

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SE Adv Practical-6

Pre-Lab:

1) Which of the following is a dynamic model that shows how the system interacts with its environment as it is used?

a) system context model
b) interaction model
c) environmental model
d) both system context and interaction

Ans: Option b- interaction model

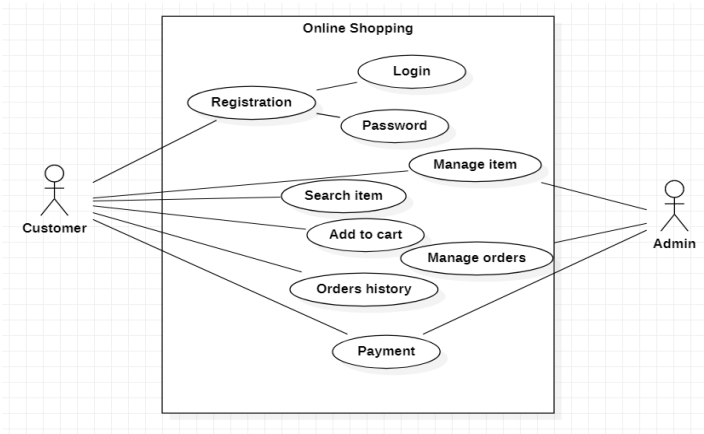
2) Which type they considered Activity diagram, use case diagram, collaboration diagram, and sequence diagram?

a) non-behavioral
b) non-structural
c) structural
d) behavioral

Ans:Option d- behavioral

3) Nitya wants to design an online shopping application. She wants to design a component diagram for her application. Help her to design the UML diagram.

Ans**: Usecase diagram for Online Shopping Application**



4) A _____ diagram represents the flow of the data in model

a)Collaboration
b) Sequence
c) Activity
d) None of the mentioned

Ans:Option b-sequence

5)**Swim lanes** may be arranged _____.

a) Horizontally

b) Vertically

c)Diagonally

d)Both a & b

Ans:Option d-both a & b

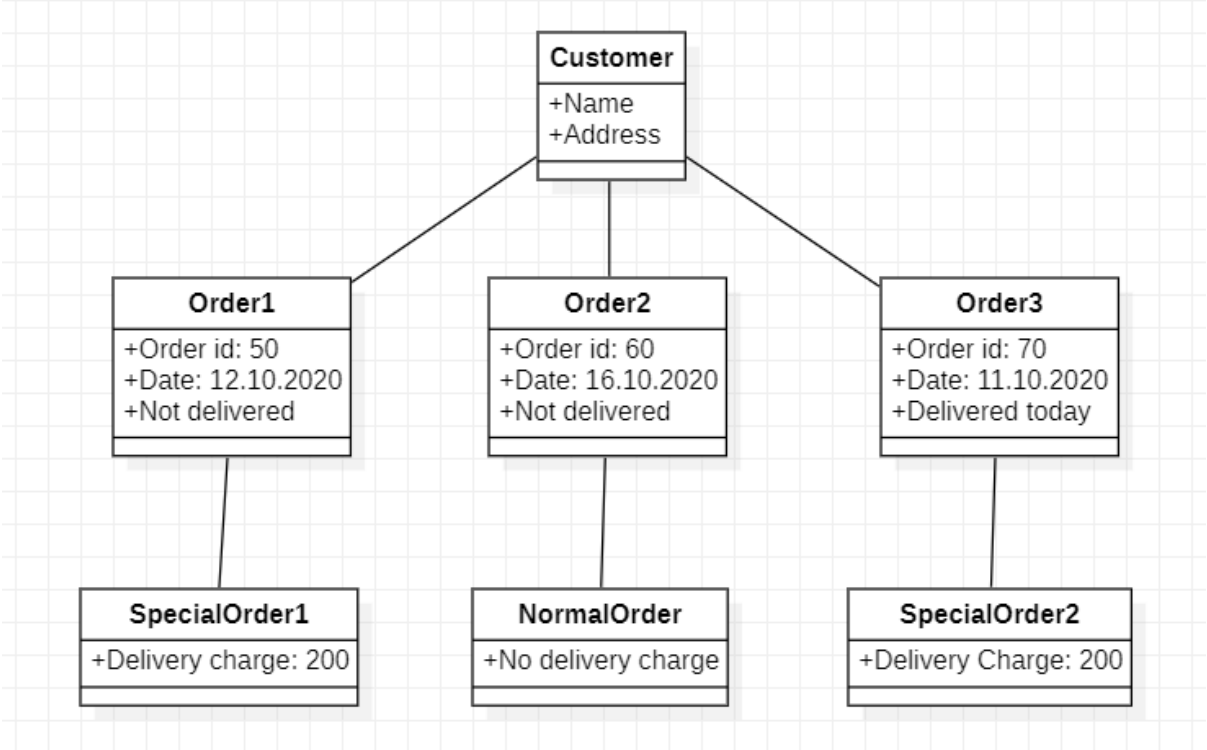
In Lab:

1.Draw the object diagram for the order system. It has a customer order which can be normal order, or it can be a special order and every customer has their cart and wish list. The customer gives 3 orders of cakes of different types. Create your own date of cake prepared

1. First order is special order of id 46, give your own delivery date and mention the status.
2. Second order is normal order of id 65, give your own delivery date and mention the status.
3. Third order is special order of id 48, give your own delivery date and mention the status.
4. If it is a normal order then, no delivery charges are applied.

5.If it is a special order then, delivery charges of 200 are applied.

Class diagram for Order System



Post Lab:

1.What are the element which are used in activity diagram?

Ans:

UML defines a specific notation and set of rules for creating Activity Diagrams. The following are the most commonly used elements:

- **Initial Node** - The initial node represents the starting point of the activity diagram.
- **Activity Final Node** - The activity final node represents the termination point of the activity.
- **Action Node** - An action node is a type of activity node that represents a single action or behavior of the activity being modeled.
- **Activity Edge** - An activity edge creates a directed connection between two activity nodes. It represents the path that a token can take between two activity nodes.
- **Decision** - A decision has one flow entering and several exiting. The exiting flows each have a condition that must be met in order to traverse the flow.
- **Merge** - A merge has several flows entering and one exiting. The merge denotes that multiple parallel flows are merging at a single point. Only one flow must reach the merge point in order to continue to traverse the flow to the next activity.
- **Fork** - A fork has one flow entering and several exiting. A fork denotes that several processes are occurring in parallel.
- **Join** - A join has several flows entering it and one exiting it. A join denotes that multiple parallel flows are merging at a single point. All flows going into the join must be completed before the next activity can start.

2.Discuss the need of Fork and Join?

Ans:

Fork - A fork has one flow entering and several exiting. A fork denotes that several processes are occurring in parallel.

Join - A join has several flows entering it and one exiting it. A join denotes that multiple parallel flows are merging at a single point. All flows going into the join must be completed before the next activity can start.

3.What are the rules must be followed while developing an activity diagram

Ans:-

Activity diagram is used to model business processes and workflows. These diagrams are used in software modeling as well as business modeling.

Most commonly activity diagrams are used to,

1. Model the workflow in a graphical way, which is easily understandable.
2. Model the execution flow between various entities of a system.
3. Model the detailed information about any function or an algorithm which is used inside the system.
4. Model business processes and their workflows.
5. Capture the dynamic behavior of a system.
6. Generate high-level flowcharts to represent the workflow of any application.
7. Model high-level view of an object-oriented or a distributed system.