



Assignment No - 4.

Q.1] What is the definition of oo modeling and design.

→ ① object-oriented modelling and design is a way of thinking about problems using models organized around real world concept

② The fundamental construct is the object, which combines both data structure and behavior.

Definition - oo means that we organize software as a collection of discrete objects (that incorporate both data structure and behavior)

There are four aspects (characteristics)

required by an oo approach identity -

- classification

- Inheritance

- Polymorphism

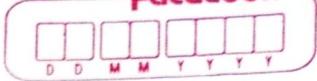
OOD (Object oriented design)

To the process of planning a system of interacting objects for the purpose of solving a software problem.

- object oriented design is the process of creating a software system or application utilising an object oriented paradigm.

- object oriented design is an implemented form of the object oriented programming (OOP) paradigm.

Q.2] Explain characteristics of object-oriented describe identify, classification, inheritance polymorphism characteristics.



→ object oriented modeling and design is a way of thinking about problems using models organised around real world concept.

- It promotes better understanding of requirement.

Analysis → Design → Implementation

characteristics :-

1] Identity :-

- Data is quantized into discrete, distinguishable entities called object
- Each Object has its own inherent identity
- Two objects are distinct even if all their attributes values are identical
- Each object has a unique handle which it can be referenced
- Handle in various ways such as an address, array index, or artificial number

2] classification :-

~~- objects with some data structure (attributes) and behaviour (operations) are grouped into a class~~

- A class is an abstraction that describes properties important to an applications and ignores the rest

- Each class describes an infinite set of individual objects

- An object is an instance of class

① Inheritance:-

- sharing of attribute, and operations (features) among classes based on a hierarchical relationship.
- super class has general information that subclasses refine and elaborate
- Each subclass incorporates or inherits all the features of its super class and address its own unique features.
- Ability to factor out common features of several classes into a superclass

② Polymorphism:-

- some operations behave differently for different classes.
- An operation is a procedure or transformation that an object performs.

Method -

An implementation of an operation by specific class

Each object "knows how" to perform its own operation.

object oriented operator is polymorphism

Elaborate object-oriented themes

Describe abstraction, encapsulation, combining data and behaviour, sharing theme.



2) Abstraction -

Focus of essential aspects of an application while ignoring the details what an object is and does before deciding how to implement.

Preserves the freedom to make decision as long as possible by avoiding premature commitments to details

e.g. A class called Animal

Properties - ears, colour, eyes

method - eating, running

Sub class - Tiger

3] Encapsulation:-

• Separate the external aspects of an object from internal implementation.

Data structure and behaviour is encapsulate in a single entity.

Ensuring reliability and maintainability

Information exchange is done by public interface among objects.

change internal data structures does not affects other objects.

e.g. capsule given by the we does not have to worry how this methods and properties work

4] Combining data and behavior -

Data structure hierarchy matches the operations inheritance hierarchy.



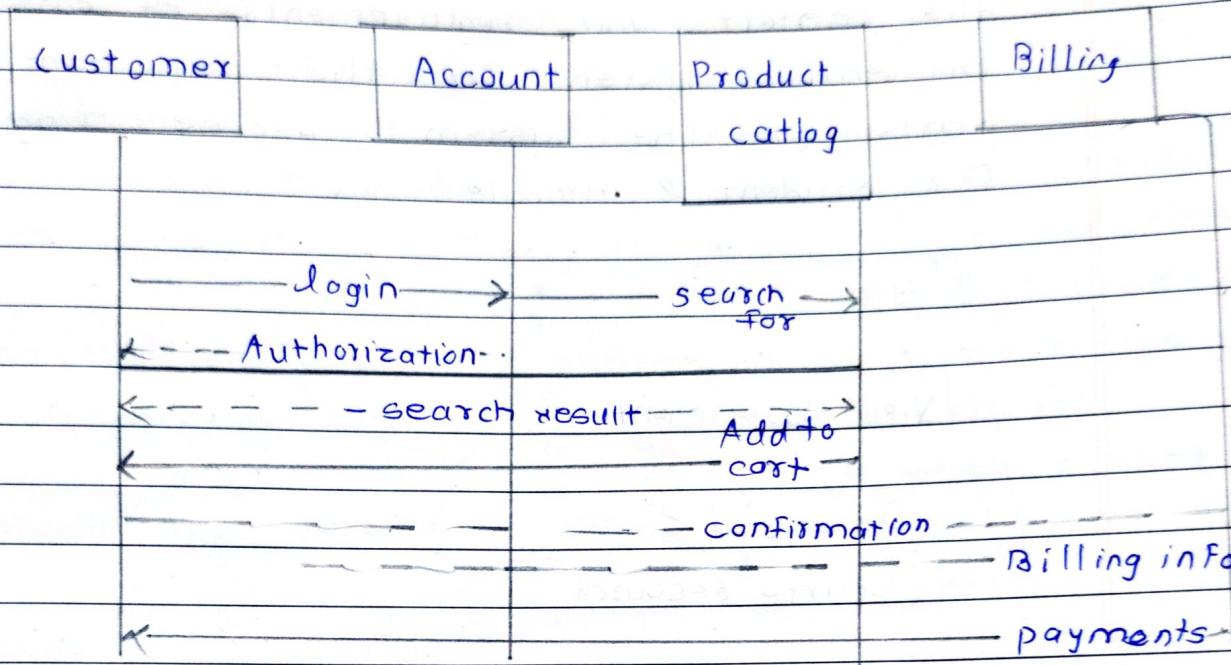
- 4] sharing
 - No redundancy (Inheritance)
 - Reusability (facts - abstraction, inheritance, encapsulation)

What is sequence diagram in UML? build sequence diagram for:

Amazon online shopping (Plane, order, Bill, payment, parcel tracking and delivery)

- 1) A sequence diagram is a unified modeling language diagram that illustrates the sequence of message between objects in an interaction.
- 2) A sequence diagram consists of a group of objects that are represented by lifelines and the messages that they exchange over time during the interaction.
- 3) A sequence diagram shows the sequence of messages passed between objects.
- 4) Sequence diagrams can also show the control structures between objects eg. lifeline in a sequence diagram for a banking scenario can represent a customer, bank teller or bank manager.

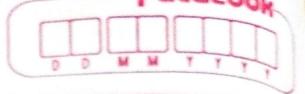
sequence diagram for Amazon online shopping



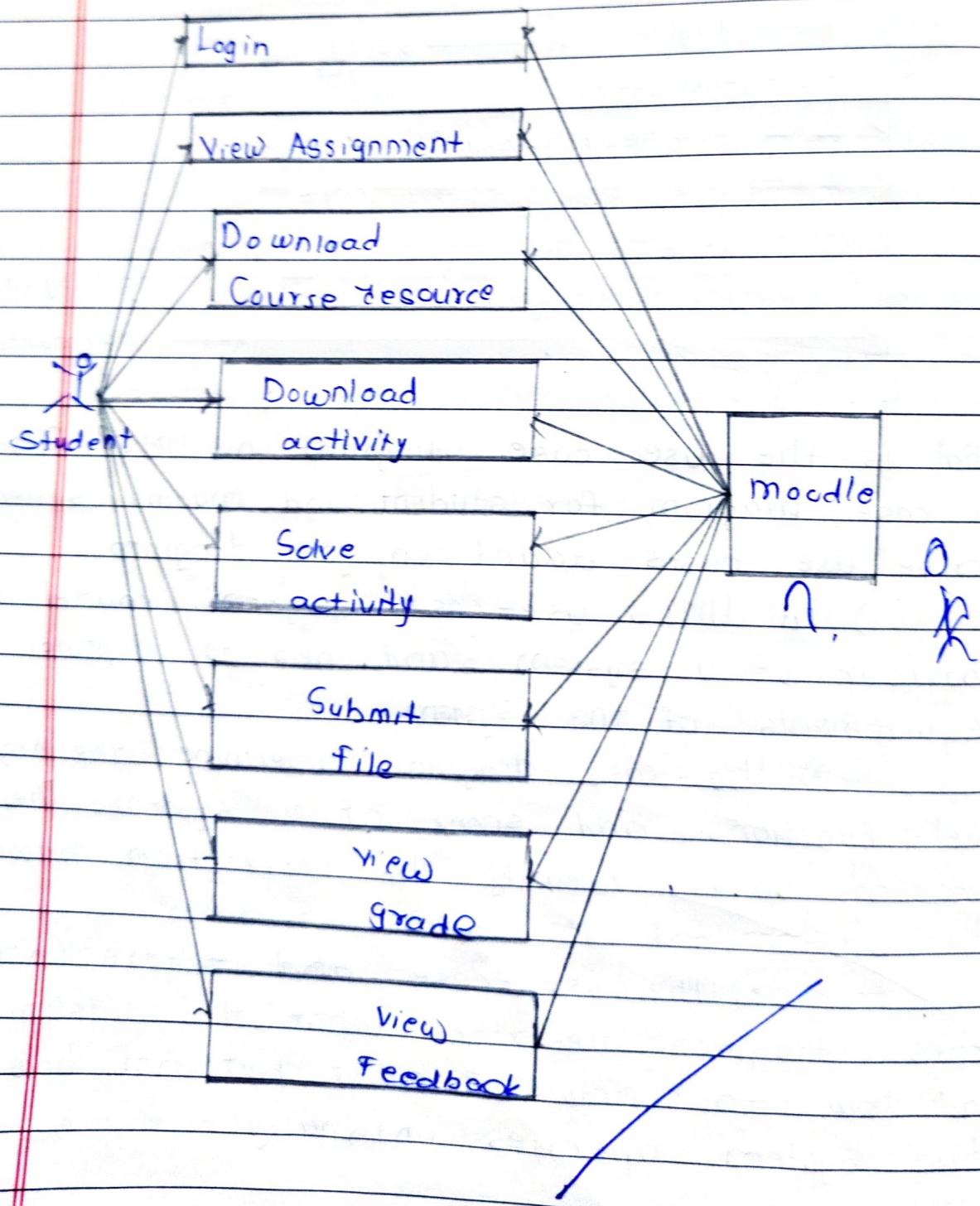
What is the use case diagram in UML? Design use case diagram for student and moodle system

Describe use cases added in your diagram.

- 1) In UML, use-case diagram model the behaviour of a system and help to capture the requirements of the system.
- 2) Use-case diagrams determine the high-level functions and scope of a system. These diagrams also identify the interaction between the system and its actors.
- 3) The use-cases and actors in use cases diagram describe what the system does and how the actors use it but not how the system operates internally.



a] use-case diagram illustrate and define the context and requirements of either an entire system or the important parts of the system use-case diagram for student & moodle.





In the student and moodle system moodle create one login page for the student can login the account with the help of Id and password that given by the college.

After the logging into moodle student can view the assignment with respective courses.

If there is need of any study material or related courses then student can download the any activity related to course solve that activity and student need to submit the activity within a time (due date) after submission teacher can grade the activity then student can view their grades and give the respective feedback.

What is collaboration diagrams in UML? design collaboration diagram for any online food order application like zomato or swiggy describe your collaboration diagram.

1] In UML diagrams a collaboration is a type of structured co-operate to define the internal structure of classified.

2] We use a collaboration when we want to define only the roles and connections that are required to accomplish a specific goal of the collaboration.

3] collaboration describe object interaction organized around the objects and their links to each other

4] focus on exchange of message between objects

• collaboration diagram is semantically weak than

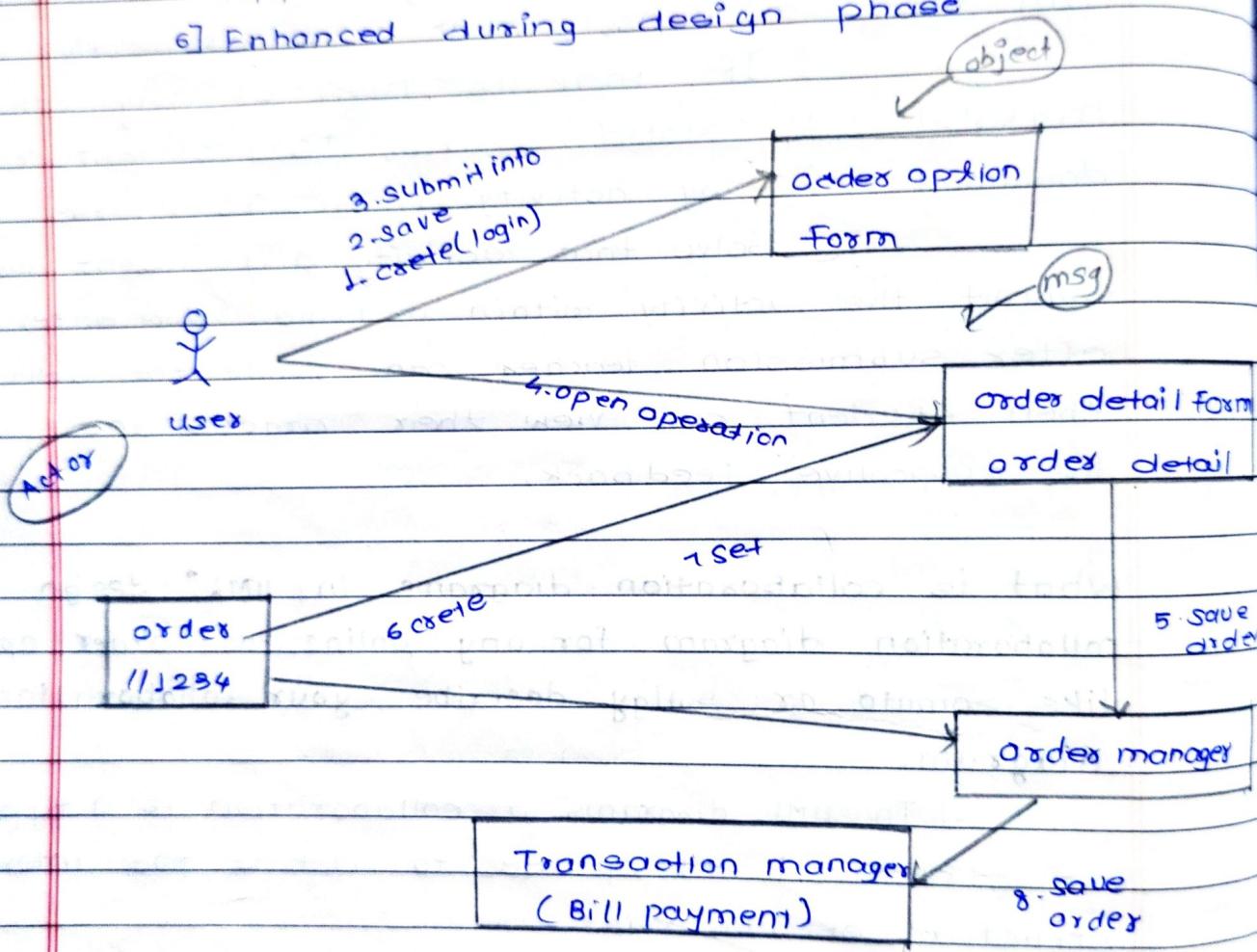


sequence diagram

- The message given with the numbering it is also called as communication diagram through their ass

5] Appears during Analysis phase

6] Enhanced during design phase



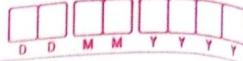
In collaboration diagram for online food order in zomato the 1st requirement is user should login to the zomato app submit all the info order the food from the option form write the all details of ordered food: save that order



The order is now given to the respective order manager save that order for the transaction manager to confirm the bill payment get the info of order for bill payment.

With reference to UML explain concept of class diagram

- ① Class diagram is a static diagram it represent the static view of an application.
- ② Class diagram is not only used for visualizing, describing and documenting different aspects of a system but also for constructing executable code of the software application.
- ③ Class diagram describe the attribute and operations of a class and also the constraints imposed on a system.
- ④ The class diagram are widely used in the modeling of object oriented systems because they are the only UML diagrams, which can be mapped directly with object-oriented language.
- ⑤ Class diagram shows a collection of classes, interfaces, associations, collaborations and constraints. It is also known as structural diagram.
- ⑥ UML diagrams like activity diagram, sequence diagram can only give the sequence flow of the application.
- ⑦ Class diagram of a bit different it is most popular UML diagram in the coder community.
- ⑧ The purpose of the class diagram can be summarized as -



- Analysis and design of the static view of an application
- describe responsibilities of a system
- base for component and deployment diagram forward and reverse engineering

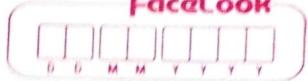
customer		order	
name: string		date: Date	
Location: string		number: string	
send order()		confirm()	
receive order()		close()	

Special order	Normal order
date: Date	date: Date
number: string	number: string
confirm()	confirm()
close()	close()
dispatch()	dispatch()
	receive()

What is UML. Draw class diagram and object
Diagram for "Rental Movie Application with
Invoice and checkout function

UML - Unified Modeling language

UML, which stands for Unified
Modeling Language is way to visually
represent the architecture Design & complex
implementation software systems



UML is a standard notation for modeling of real-world objects as first step in developing an object-oriented design methodology

class diagram for rental movie Application

