

**(Section 1)**

**Q1: \_\_\_\_\_ are known as formal procedures for producing results using some notation.**

- A. Techniques
- B. Tools
- C. Methodologies
- D. Polices

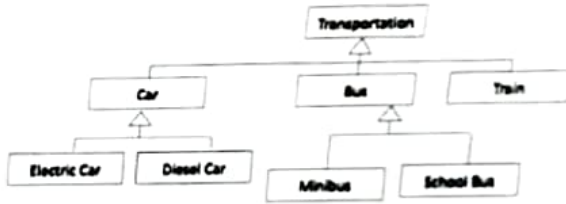
**Q2: In software engineering, a problem-solving activity that includes putting the problem pieces together into a large structure is referred to \_\_\_\_\_.**

- A. Analysis
- B. Synthesis
- C. Evaluation
- D. Assessment

**Q3: In system model, the object model deals with \_\_\_\_\_.**

- A. the structure of the system
- B. the functions of the system
- C. the purposes of the system
- D. how does the system react to external events

**Q4: In the below figure, the type of hierarchy relationship is \_\_\_\_\_.**



- A. Part-of Hierarchy
- B. Is-Kind-of Hierarchy
- C. Whole-of Hierarchy
- D. As-Is-Hierarchy

**Q5: Which of the following should not be included in the requirements elicitation phase?**

- A. Properties of the system
- B. User tasks that the system needs to support
- C. Development methodology
- D. The purpose of the system

**Q6: \_\_\_\_\_ is known as a quality assurance step, usually performed after requirements specification or analysis.**

- A. Requirements analysis
- B. Requirements validation
- C. Requirements management
- D. Requirements gathering

Q7: State Chart Diagrams is used to identify \_\_\_\_\_.

- A. an individual state object over time
- B. static structure of the system
- C. relationship between objects over time
- D. dynamic behavior of a system

Q8: \_\_\_\_\_ is an entity outside the system to be modeled, interacting with the system.

- A. Class
- B. Actor
- C. Object
- D. Use case

Q9: When using the Abbott's textual analysis technique to find participating objects in a use-case flow of events, we \_\_\_\_\_.

- A. look for verbs that are candidates to be objects
- B. look for nouns that are candidates to be objects
- C. ask application domain experts to identify relevant objects
- D. use reusable design patterns to locate similar objects

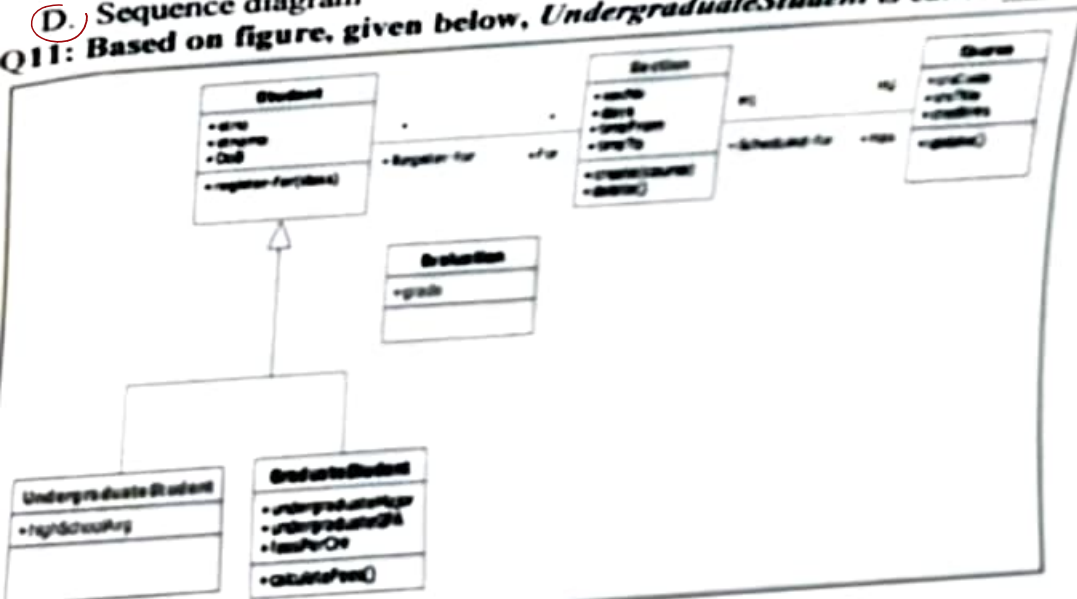
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Q10: \_\_\_\_\_ is used during system analysis to refine use case descriptions and complement the class diagram as it helps in finding additional objects.

- A. Use case diagram
- B. Class diagram
- C. Activity diagram
- D. Sequence diagram

Q11: Based on figure, given below, *UndergraduateStudent* is called \_\_\_\_\_



- A. An association class
- B. A sub class
- C. A super class
- D. An object

2: Based on figure, given in Q11, the operation(s) of the *GraduateStudent* class is/are

Q13: What is not correct about the reuse by composition?

by aggregation

- A. New functionality is obtained by aggregation.
- B. Reuse of functionality already available.
- C. New functionality is obtained by inheritance.
- D. It is also called Black Box Reuse.

Q14: Which of these patterns is considered as a Behavioral pattern?

- A. Adapter Pattern.
- B. Strategy Pattern.
- C. Façade Pattern.
- D. Composite Pattern.

Q15: ..... allows different implementations of an interface to be decided upon dynamically.

- A. Composite Pattern.
- B. Façade Pattern.
- C. Bridge Pattern.
- D. Adapter Pattern.

Q16: Component 'requires interface' defines:

- A. The services that are provided by the component to other components.
- B. The methods that can be called by a user of the component.
- C. The services that must be made available for the component to execute as specified.
- D. The component API.

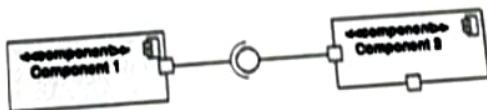
Q17: Interface incompatibility by operation incompleteness happens when:

- A. The provides interface of one component is a subset of the requires interface of another.
- B. The names of operations in the composed interfaces are different.
- C. The operations have the same name but are of different types.
- D. The operations have the same name and identical types.

Q18: A critical distinction between a service and a component as defined in CBSE is that:

- A. Services do not have a 'provides' interface.
- B. Services do not have a 'requires' interface.
- C. Services are language-dependent.
- D. Services are language-independent.

Q19: What is the type of component composition shown in following figure?



- A. Sequential composition.
- B. Additive composition.
- C. Hierarchical composition.
- D. Composition by glue code.

Q20: The 'what' part of WSDL (Web Services Description Language) document, specifies: ) )

- A. The mapping of the abstract interface to a concrete set of protocols.
- B. What operations the service supports and the format of the messages that are sent and received by the service.
- C. The technical details of how to communicate with a Web service.
- D. The location of a specific Web service implementation.

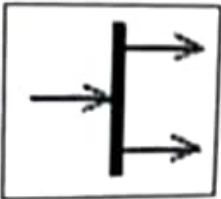
Q21: It is important to use a \_\_\_\_\_ design pattern to simplify the interface to a complex system and save the user from its complex details.

- A. Adapter
- B. Composite
- C. Facade
- D. Bridge

Q22: Which of the following notation is used in UML state chart diagrams to show the conditions?

- A. \*
- B. /
- C. []
- D. •

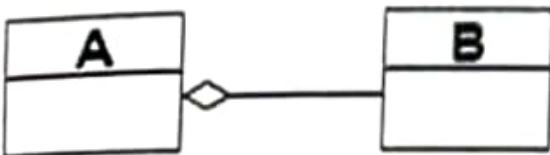
Q23: Which kind of node does the following image show in activity diagram?



- A. Merge node
- B. Decision node
- C. Fork node
- D. Join node

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% integrate components

Q24: Which of the following statement about the given diagram is true?



- A. If an instance of A is deleted, all contained instances of B are also deleted
- B. If an instance of B is deleted, all contained instances of A are also deleted
- C. A is part of B
- D. If an instance of A is deleted, the contained instances of B are not affected



## Q2C: Write four benefits of Service-Oriented Approach (SOA).

- ..1. The service provider makes information about the service public so that any authorized user can use the service.
2. Applications can delay the binding of services until they are deployed or until execution.
3. Service users can pay for services according to their use rather than their provision.
- ...4. Applications can be made smaller, which is particularly important for mobile devices with limited processing and memory capabilities...

## Q2D: Given the following description:

"ARENA is a game independent in the sense that organizers can adapt a new game to the ARENA game interface, upload it to the ARENA server, and immediately announce and conduct tournaments with players and spectators located anywhere on the Internet. Organizers can also define new tournament styles, describing how players are mapped to a set of matches and how to compute an overall ranking of players by adding up their victories and losses (hence, figuring out who won the tournament). To recoup their operational costs, organizers can also invite potential sponsors to display advertisement banners during games".

## Identify the actors in ARENA system and list the system functionalities.

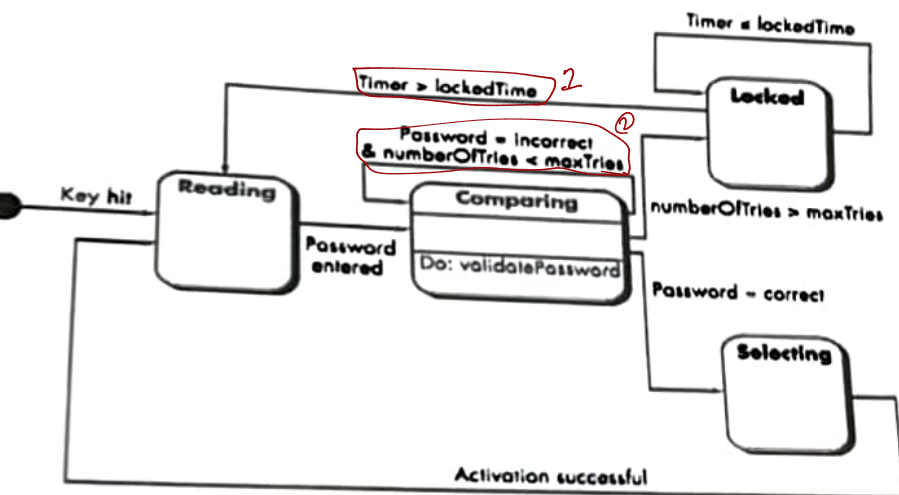
Actors:-

1. Player 2. spectators 3. Organizer

functions:

1. adapt a new game
2. announce and conduct tournaments
3. define a new style
4. describing-how mapp. player...
5. compute overall ranking
6. invite potential sponsors...

## Q2E: Given the diagram in figure below:



1-What are the square/rectangle shapes used for in above diagram?

name of state

2-What is the meaning of arrows? event

3- Identify two conditions: in diagram

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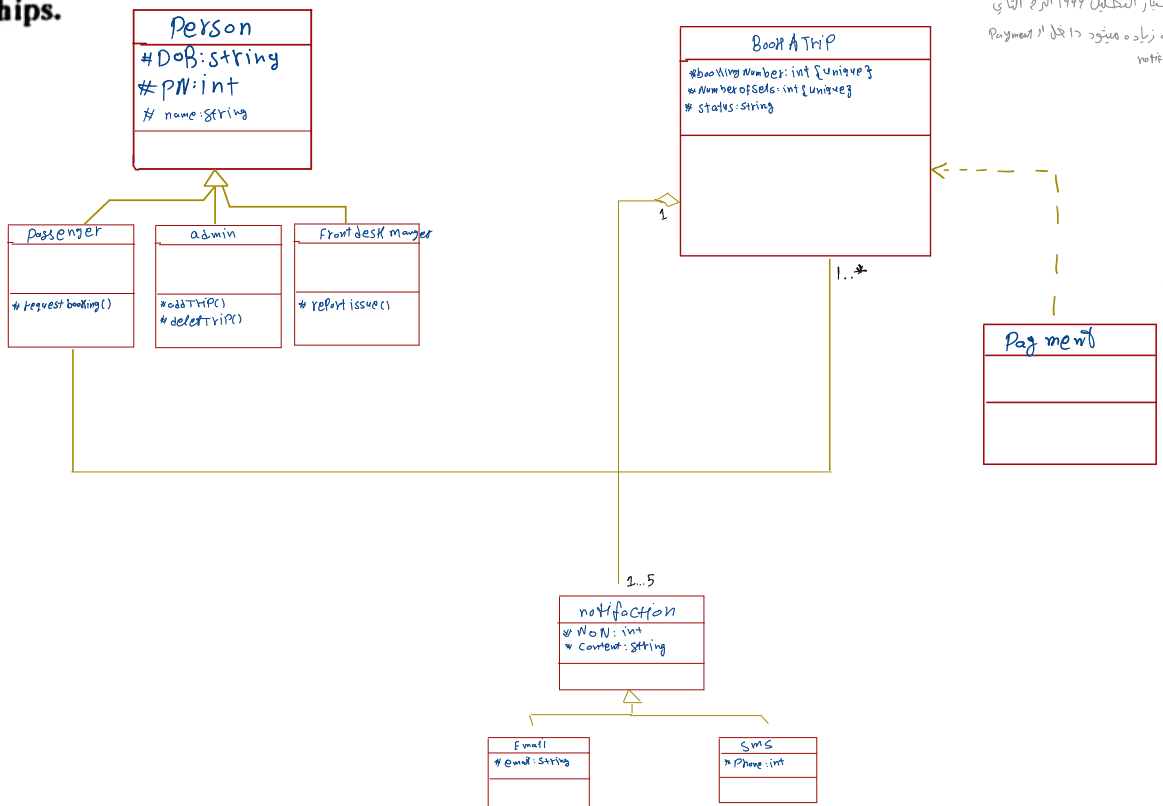
- attributes
- methods
- mult

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2F: You have been assigned to a team that will be developing for an Information System department. As part of the project startup, your project manager has asked you to draw a class diagram. You have been given the written description of the system as follows:

"A passenger has attributes like name, data of birth and phone number and has a request booking method. Admin has also name, data of birth, and phone number also has two methods add trip or delete trip. Front desk manager has also name, data of birth phone number, and report issue method. Book a trip has attributes like a unique booking number, number of seats, and status. A passenger can book a trip or many trips. In our system, there is payment for each booked trip and for each booked trip a notification message should be sent. We have two kind of notification: Emile notification and Sms notification. The notification trip has attributes like <sup>نوع</sup> number of notification and content, Emile notification has emile and Sms notification has phone. For each booked trip, one to five notifications can be sent"

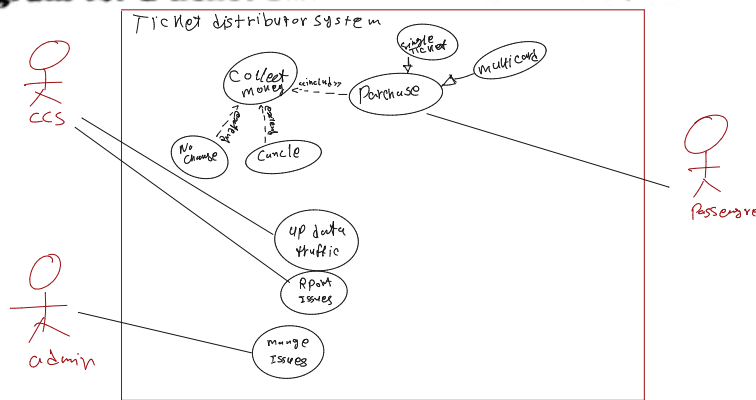
Draw a class diagram, showing the classes, their attributes, operations, multiplicity, and relationships.



2G: You have been assigned to a team that will be developing for ticket distributor for a train system. As part of the project startup, your project manager has asked you to draw a Use case diagram. You have been given the written description of the system as follows:

"The system has three actors: a passenger, a central computer system and admin. The system has many functions: Purchase MultiCard, Purchase Single Ticket, Collect Money, No Change, Cancel, Update Traffic, Report Issue, and Manage Issues. When a passenger Purchase MultiCard or Purchase Single Ticket, he must Collect Money (change). For the Collect Money function, there are two optional functions No Change or Cancel. A central computer system can Update Traffic and Report Issue only. Admin can only Manage Issues"

Draw a use case diagram for a ticket distributor for a train system.



Q2H: You have been assigned to a team that will be developing for ticket distributor for a train system. As part of the project startup, your project manager has asked you to draw a sequence diagram. You have been given the written description of the system as follows:

"Booking a ticket sequence involves interaction between four objects, i.e., passenger, bookATrip, payment and notification.

1- passenger sends request a booking message to the bookATrip object

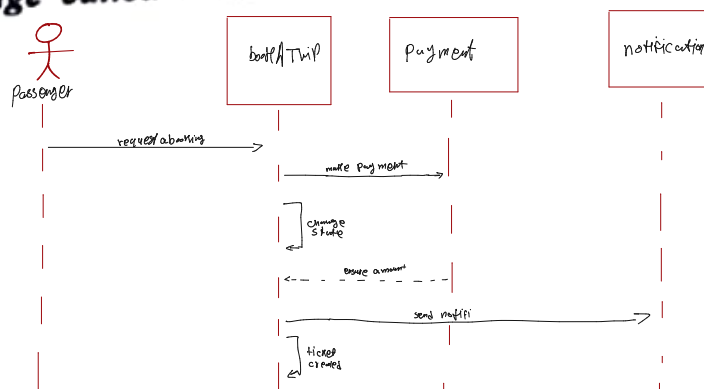
2- book a trip object then sends make payment message to the payment object

3- There is a self-message to change state of the bookATrip object and there is a return message for the payment object to the bookATrip object to ensure the amount is paid.

4- After the payment is done, sendNotification message send to the notification object

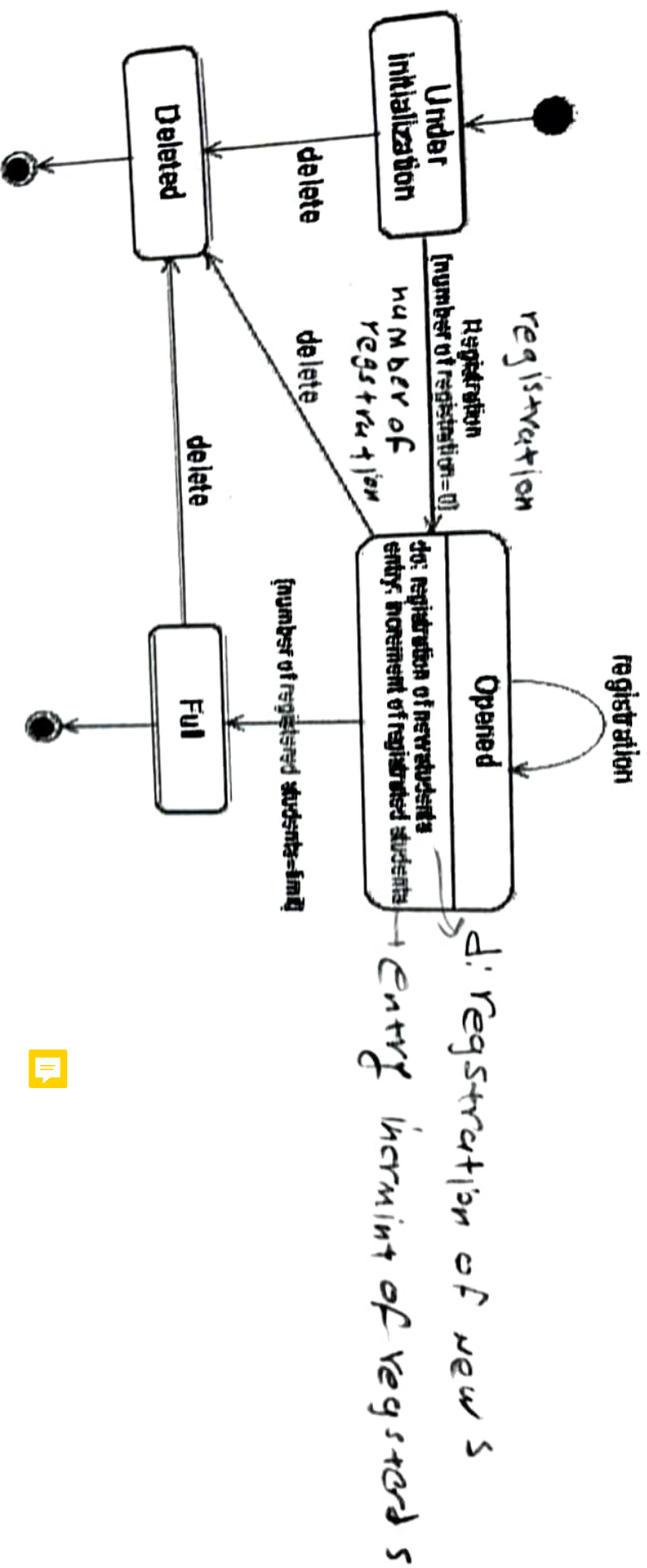
5- Then, a self-message called ticket created during the lifetime of the bookATrip object."

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## (Section 2)

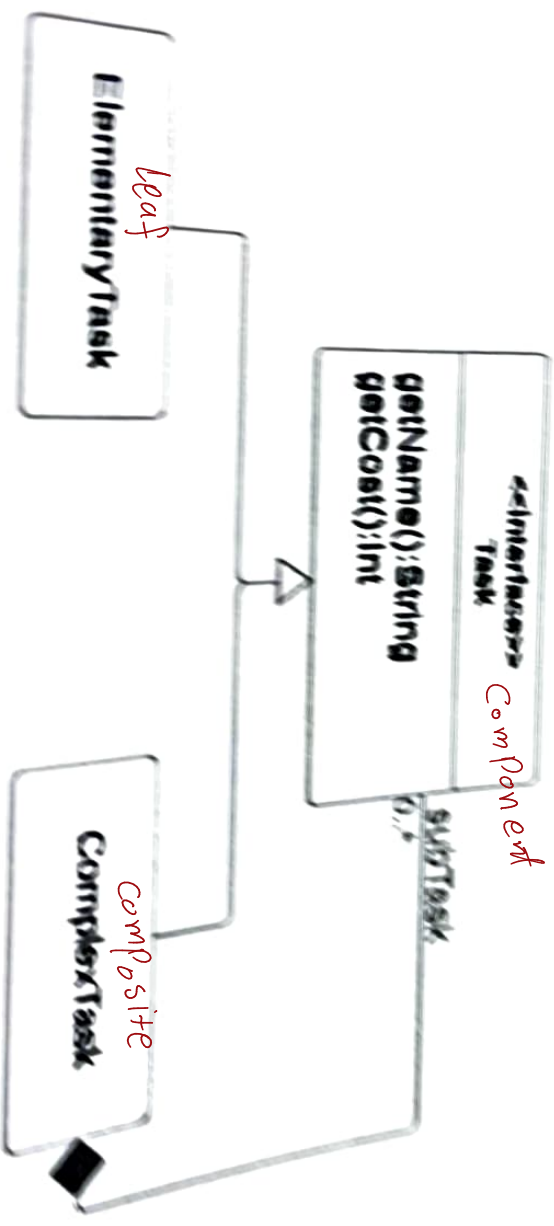
Q2A: Describe the diagram below in terms of its type, representation and its working:





**Q21:** Following figure shows an architecture for tasks. A task is characterized by a name and a cost. A task is either an elementary task or a complex task when it is composed of subtasks.

- a- What is the design pattern used in the following diagram? *Composite Pattern*
- b- What do the three boxes in the following design pattern represent?



*leaf*

*Component*

*composite*

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