1. Choose the most appropriately implemented Template pattern.

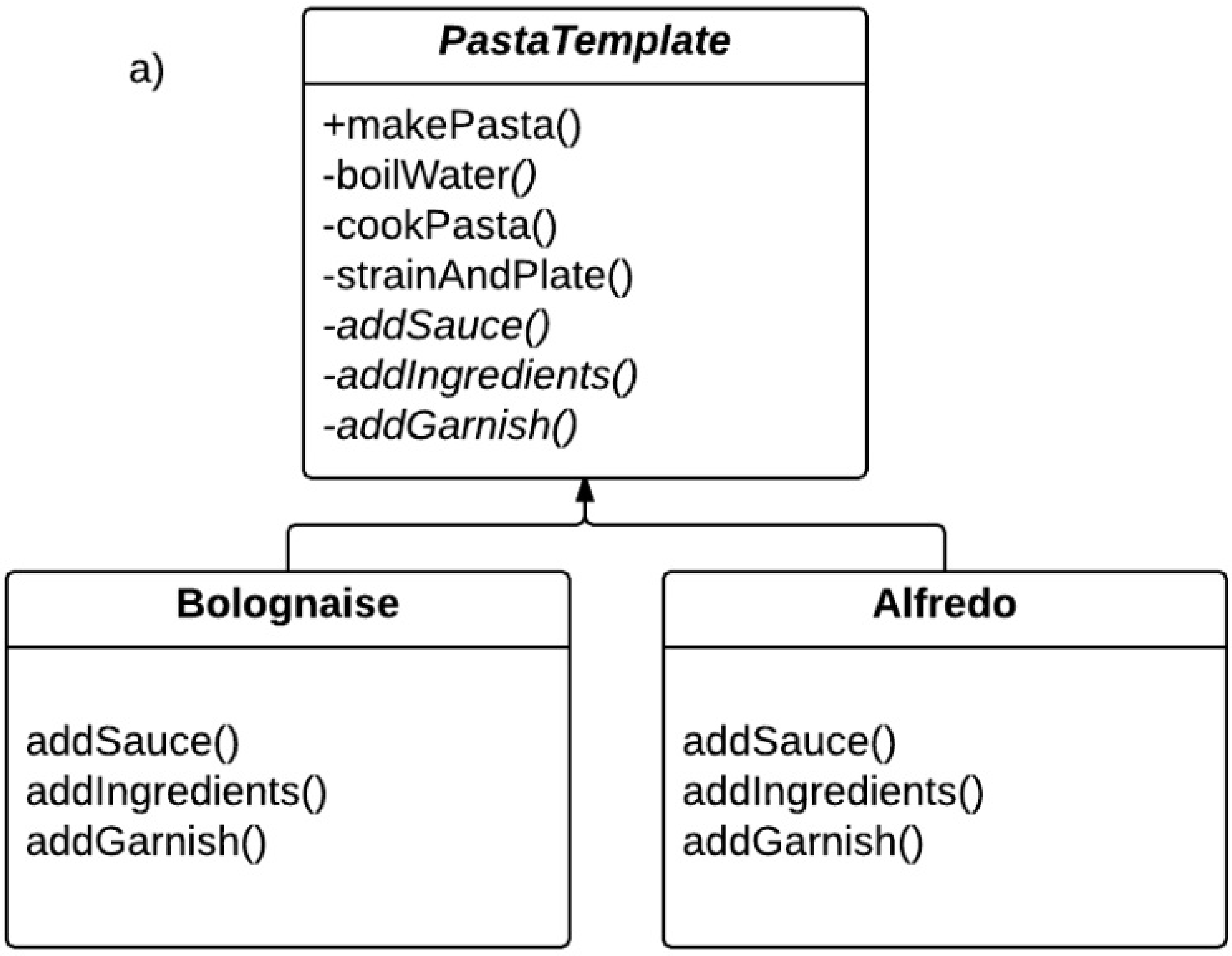
1 point

Some UML reminders that will help you:

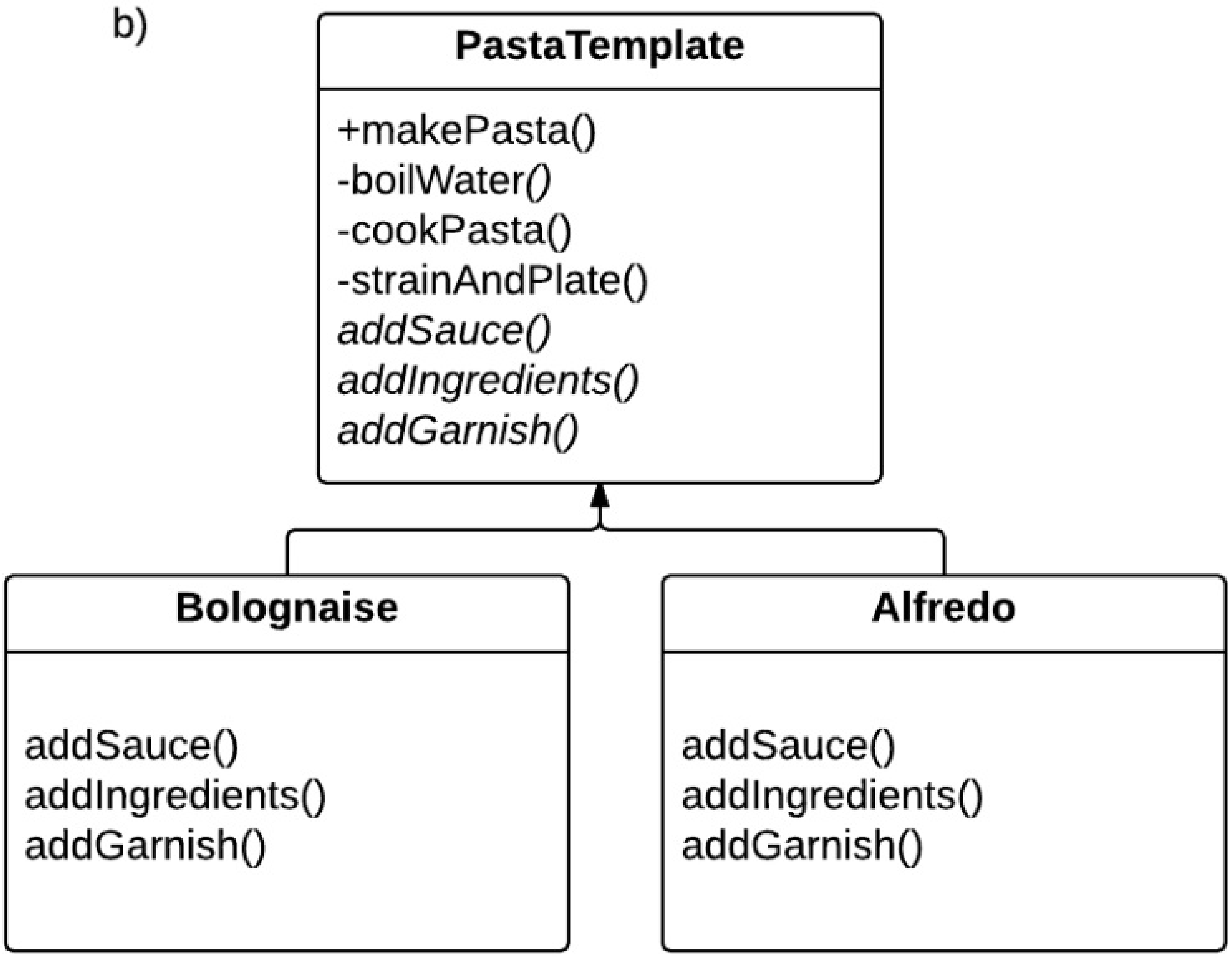
1. a private method or variable is denoted by a - as in -boilWater().

2. a method, variable, or class that is abstract is denoted by italics (as in PastaTemplate)

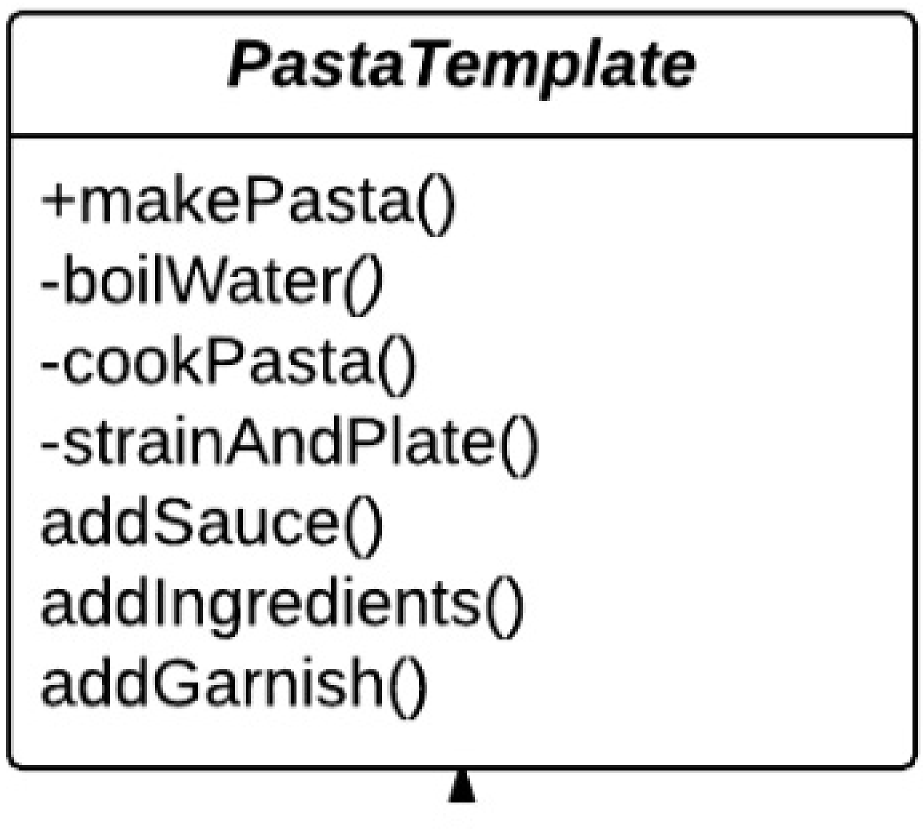
a)

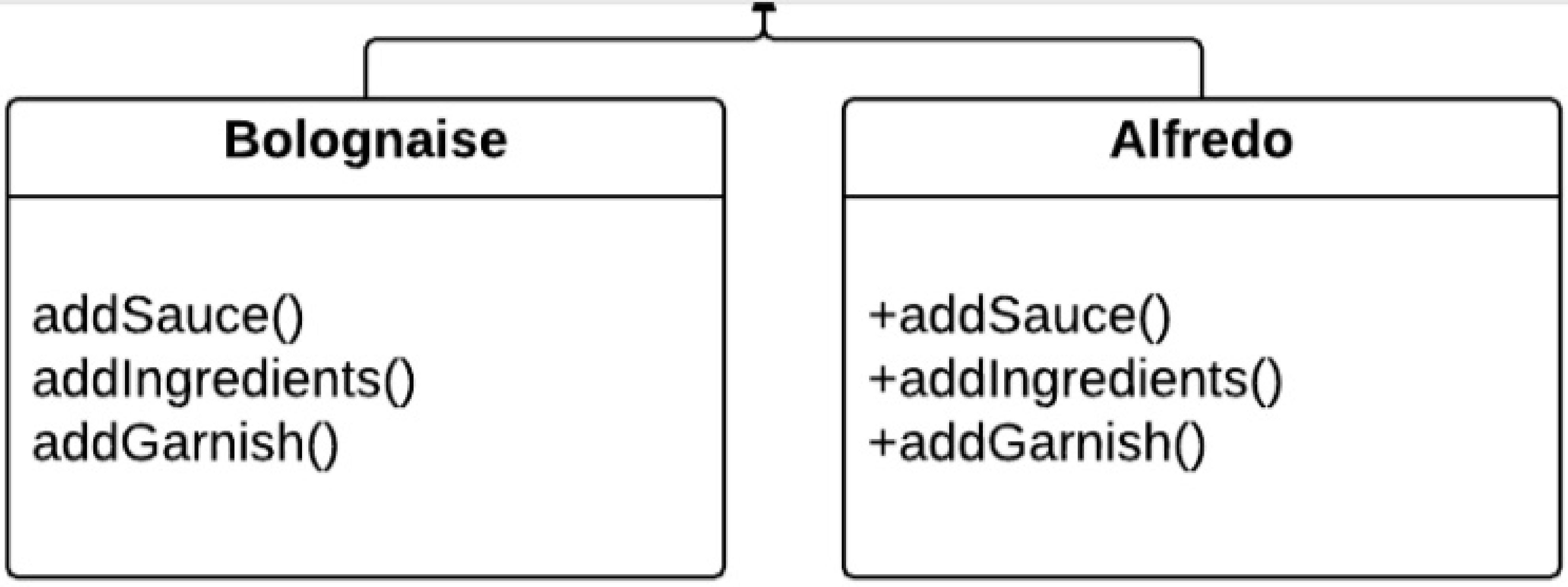


b)



c)





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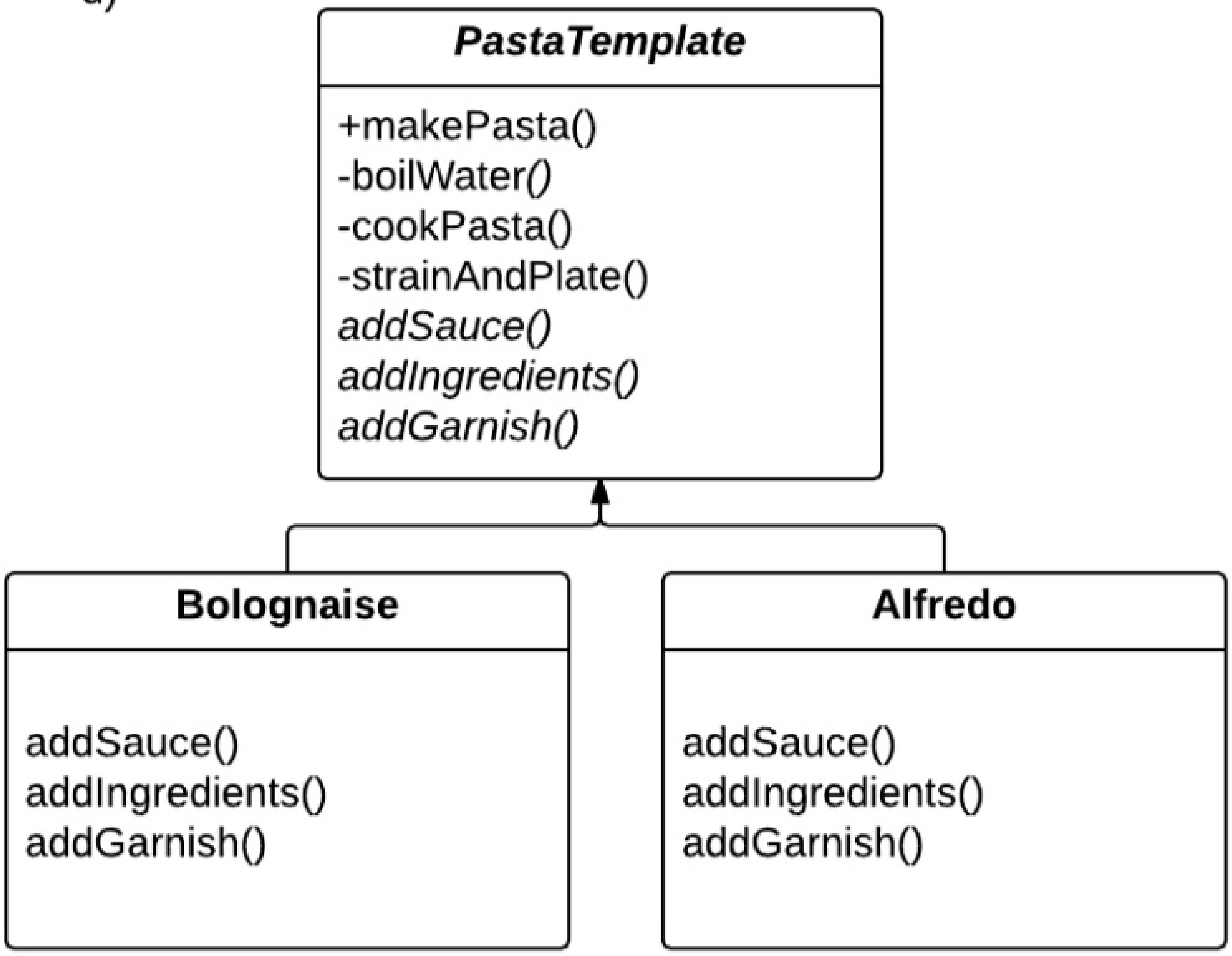


○ a)

○ b)

● c)

○ d)

⊗ **Incorrect**

Incorrect. This is not the usual implementation of Template method because the methods that makePasta uses are not abstract. Some of your methods could have default behaviour, however, so this could be used in some cases.

2. What is the correct situation for the use of a Chain of Responsibility pattern?

1 / 1 point

○ You need a set of objects to each contribute information on responding to a request.

● You have multiple potential handlers, but only one will deal with the request.

○ You need to pass a message to multiple receivers.

○ You need to delegate a set of tasks to a hierarchy of objects.

✓ **Correct**

Correct! The handlers pass the message down until one can handle it or the end of the chain is reached.

3. What is the purpose of encapsulating state in an object in the State Pattern? Choose the **three** that are correct.

1 / 1 point

□ it allows the current state to be copied from one instance to another

☑ it turns the context into a client of the state.

✓ **Correct**

Correct! This allows the context to easily make requests of the state.

☑ it allows the current state object to decide how to achieve behaviours specific to the state of the context.

✓ **Correct**

Correct! The subclasses of state provide that actual implementation of the behaviours.

☑ it removes large conditionals that are difficult to maintain.

✓ **Correct**

Correct! The state pattern outsources those "ifs" to a State object - a subclass of State - which decides how to handle requests.

4. What design principles is the Command Pattern using?

1 point

○ Encapsulation, generalization, information hiding

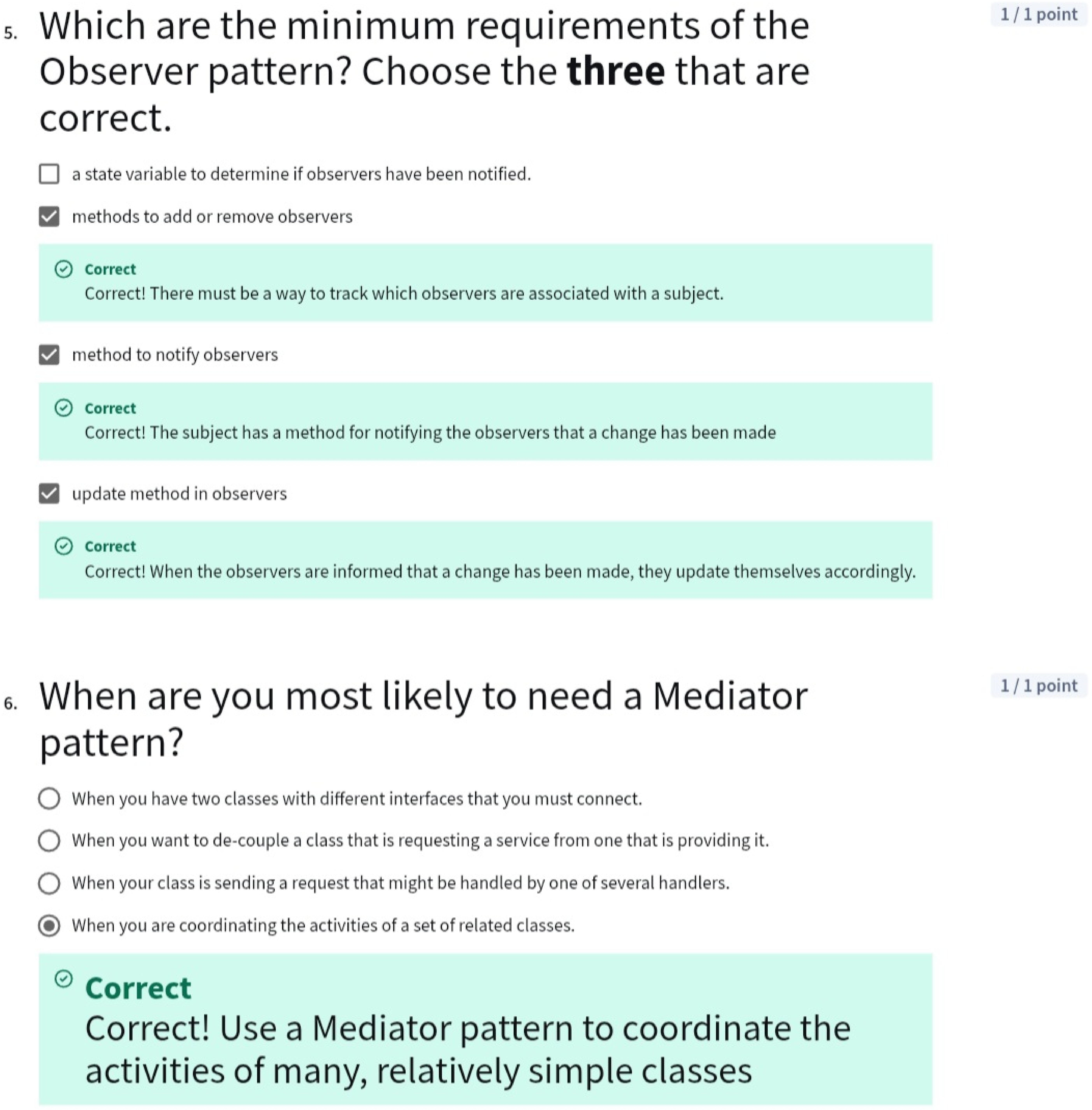
○ Encapsulation, generalization, loose coupling

○ Generalization, information hiding, loose coupling

● Encapsulation, information hiding, loose coupling

⊗ **Incorrect**

Incorrect. One of these isn't quite right, try again!



5. Which are the minimum requirements of the Observer pattern? Choose the **three** that are correct.

1 / 1 point

□ a state variable to determine if observers have been notified.

☑ methods to add or remove observers

> ✓ **Correct**
> Correct! There must be a way to track which observers are associated with a subject.

☑ method to notify observers

> ✓ **Correct**
> Correct! The subject has a method for notifying the observers that a change has been made

☑ update method in observers

> ✓ **Correct**
> Correct! When the observers are informed that a change has been made, they update themselves accordingly.

6. When are you most likely to need a Mediator pattern?

1 / 1 point

○ When you have two classes with different interfaces that you must connect.

○ When you want to de-couple a class that is requesting a service from one that is providing it.

○ When your class is sending a request that might be handled by one of several handlers.

● When you are coordinating the activities of a set of related classes.

> ✓ **Correct**
> Correct! Use a Mediator pattern to coordinate the activities of many, relatively simple classes

7.

1 / 1 point

Marlon is coding part of the software that follows a similar sequence of steps. Depending on the type of object, these steps will be implemented in slightly different ways, but their order is always the same. Which design pattern could Marlon use?

● Template pattern

○ Mediator pattern

○ Command pattern

○ State pattern

✓ **Correct**

Correct! The Template pattern specifies a general 'recipe' and some common steps in the superclass, but allows the implementation of many of the steps in that recipe to the subclasses.

8. What are the important roles in the Command Pattern?

1 / 1 point

○ Command, Queue, Receiver

○ Delegate, Command, Requester

● Command, Receiver, Invoker

○ Sender, Receiver, Invoker

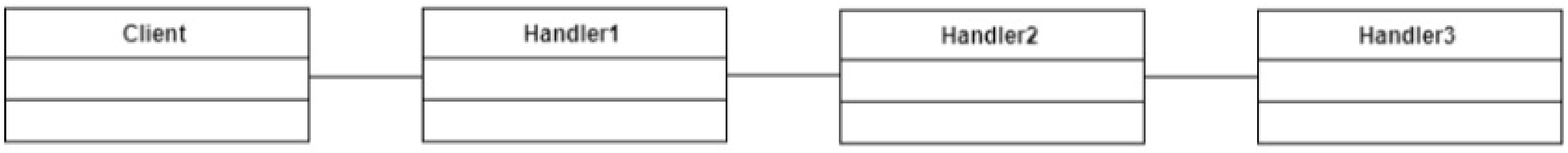
✓ **Correct**

Correct! These are the three roles that must be implemented in a Command pattern.

9. Select the best UML class diagram representation of the Chain of Responsibility pattern.

1 / 1 point

a)



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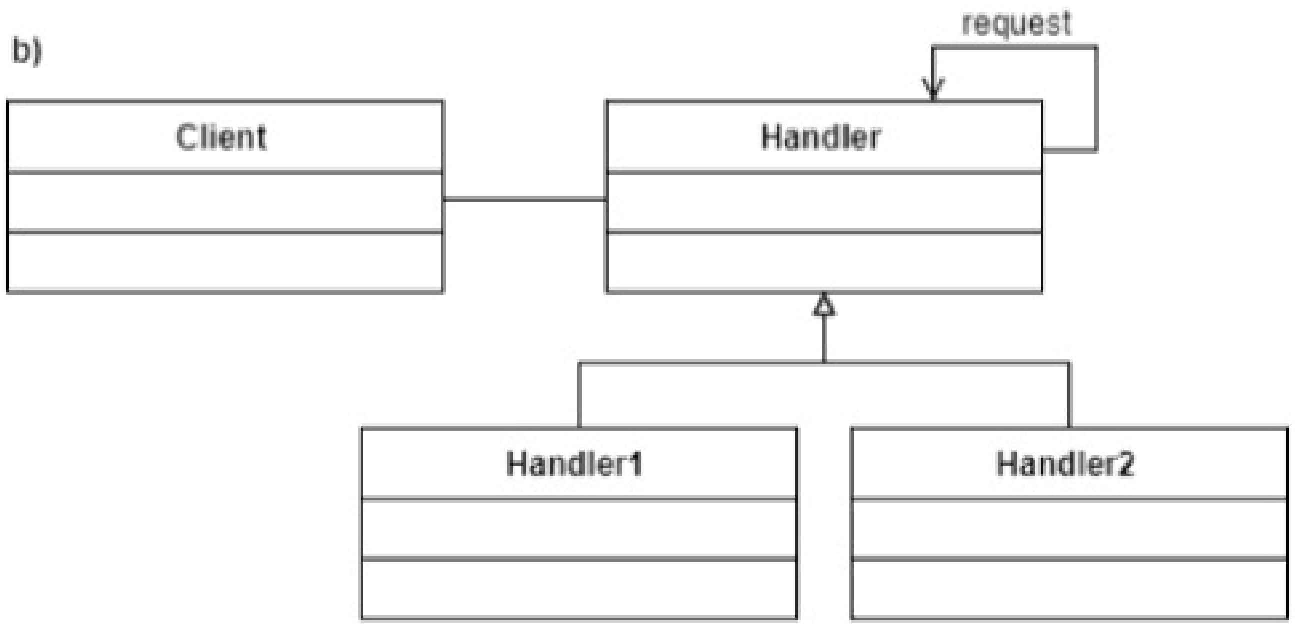

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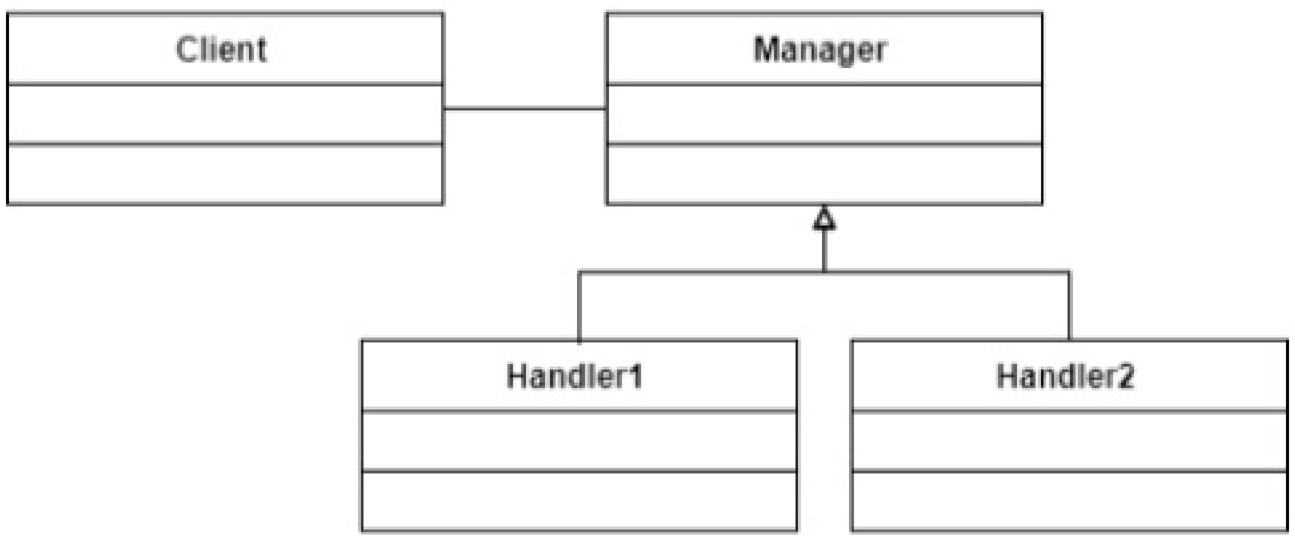

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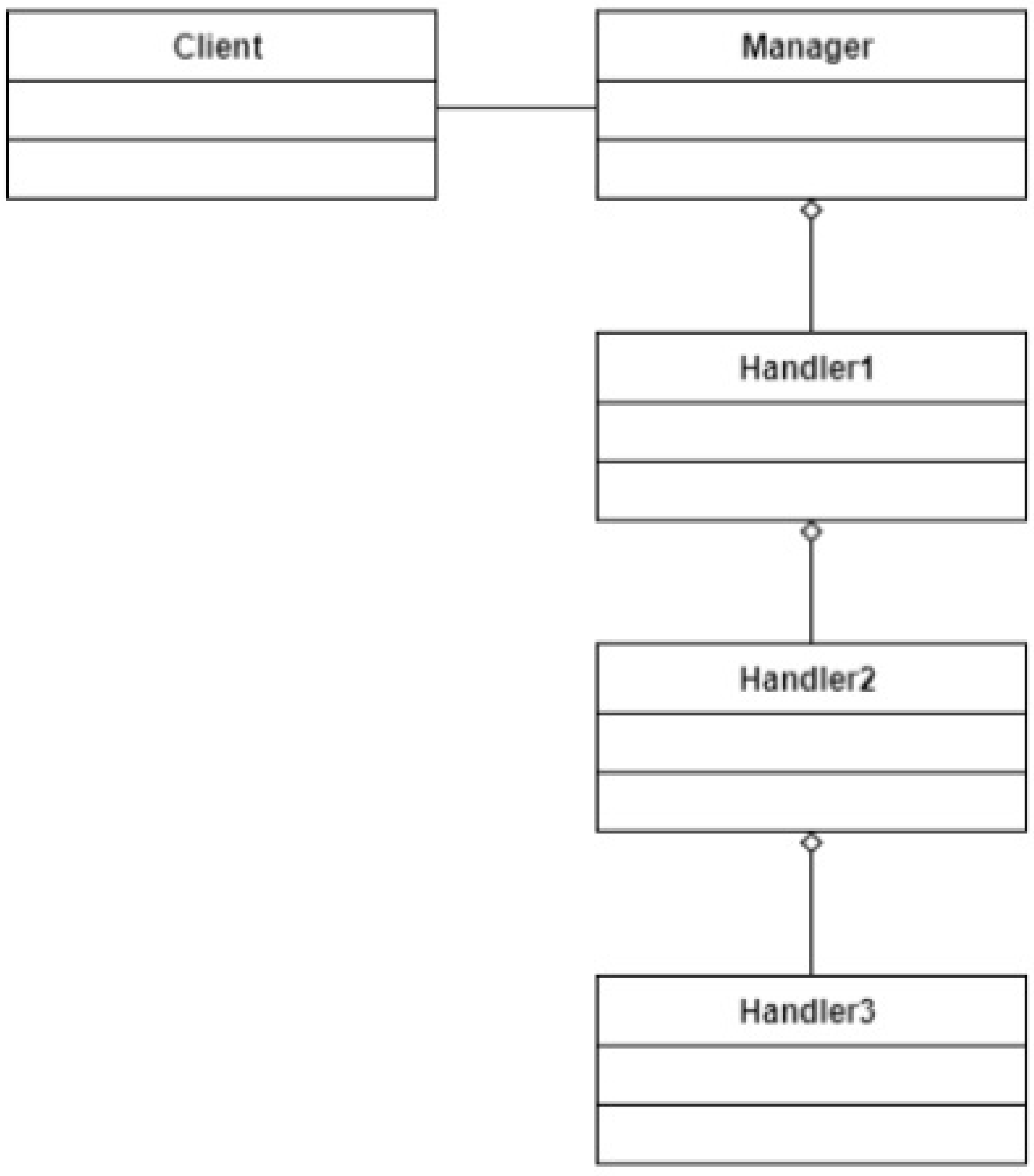


○ a)

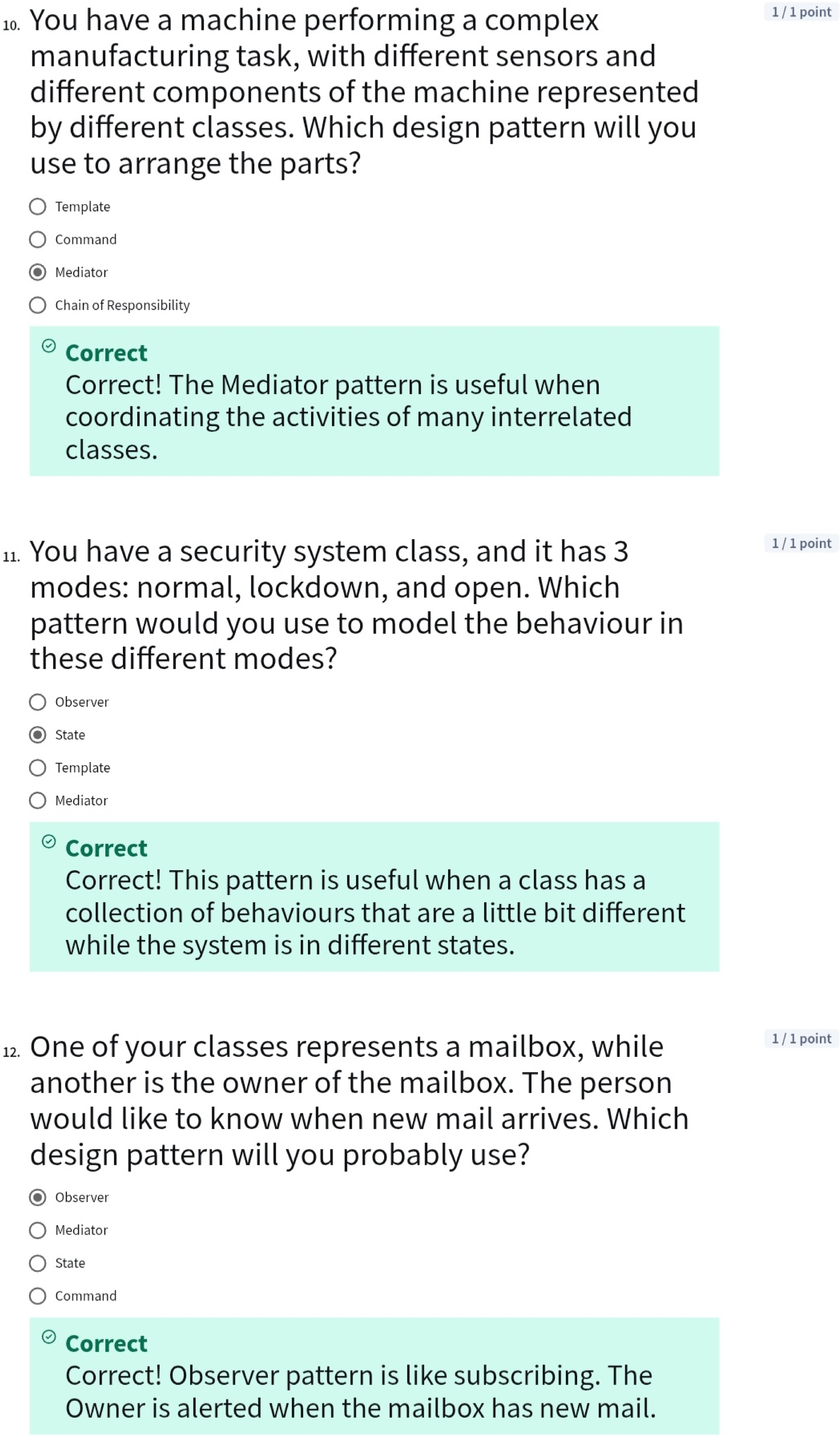
● b)

○ c)

○ d)

Correct

Correct! The Handler superclass manages the logic for determining where to send the request next. Each subclass tried to handle the request.



10. You have a machine performing a complex manufacturing task, with different sensors and different components of the machine represented by different classes. Which design pattern will you use to arrange the parts?

1 / 1 point

○ Template

○ Command

● Mediator

○ Chain of Responsibility

✓ **Correct**

Correct! The Mediator pattern is useful when coordinating the activities of many interrelated classes.

11. You have a security system class, and it has 3 modes: normal, lockdown, and open. Which pattern would you use to model the behaviour in these different modes?

1 / 1 point

○ Observer

● State

○ Template

○ Mediator

✓ **Correct**

Correct! This pattern is useful when a class has a collection of behaviours that are a little bit different while the system is in different states.

12. One of your classes represents a mailbox, while another is the owner of the mailbox. The person would like to know when new mail arrives. Which design pattern will you probably use?

1 / 1 point

● Observer

○ Mediator

○ State

○ Command

✓ **Correct**

Correct! Observer pattern is like subscribing. The Owner is alerted when the mailbox has new mail.