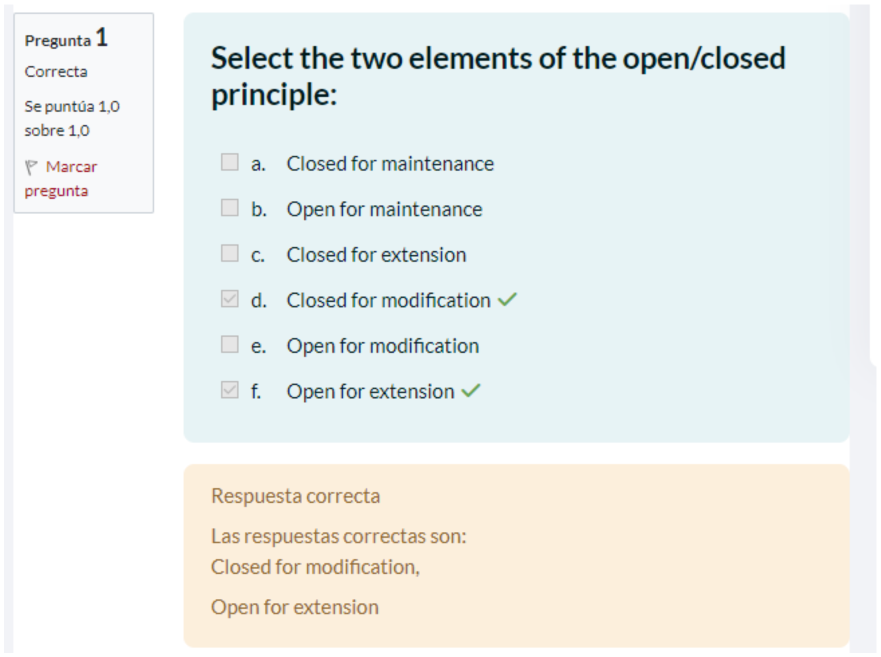
Partial correction:

Software Modeling

1.



Pregunta 1

Correcta

Se puntúa 1,0 sobre 1,0

Marcar pregunta

Select the two elements of the open/closed principle:

- [ ] a. Closed for maintenance
- [ ] b. Open for maintenance
- [ ] c. Closed for extension
- [✓] d. Closed for modification ✓
- [ ] e. Open for modification
- [✓] f. Open for extension ✓

Respuesta correcta

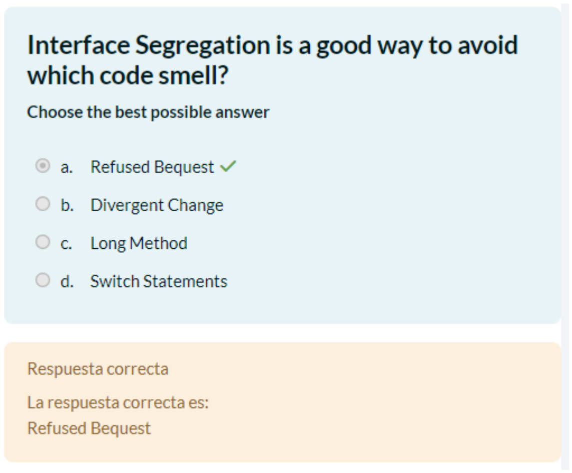
Las respuestas correctas son:
Closed for modification,

Open for extension

Justification:
I chose: Closed for modification and Open for extension.

Because the SOLID (Open/Closed) principle establishes that the code must be open for extension, that is, we must write it so that we can add new functionality, without changing the existing code that is closed for modification.

2.



Interface Segregation is a good way to avoid which code smell?

Choose the best possible answer

- [● a.] Refused Bequest ✓
- b. Divergent Change
- c. Long Method
- d. Switch Statements

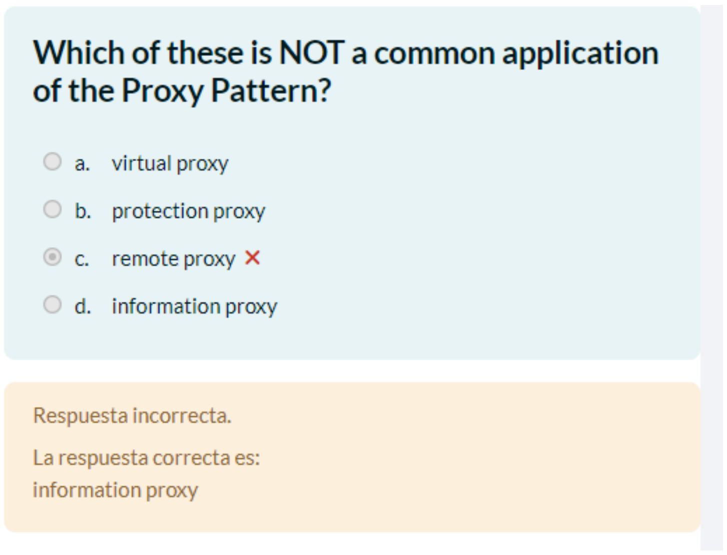
Respuesta correcta

La respuesta correcta es:
Refused Bequest

Justification:
I chose: Legacy rejected.

Because of the Interface Segregation Principle, as it suggests that clients should not be forced to rely on interfaces they do not use, i.e., that an interface should have only the methods that are relevant to the implementation class. And that's why you can avoid code odors related to unnecessary dependencies and bloated interfaces.

3.



Which of these is NOT a common application of the Proxy Pattern?

a. virtual proxy
b. protection proxy
[✓ c. remote proxy] ✗
d. information proxy

Respuesta incorrecta.
La respuesta correcta es:
information proxy

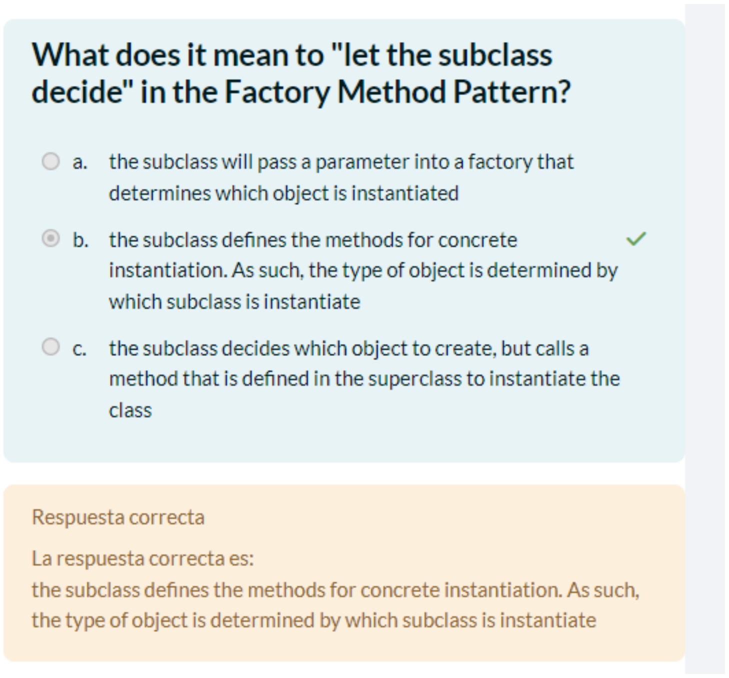
Justification:

The Proxy pattern is used to control access to an object or to provide a substitute for an expensive or remote object. Common types of proxy include Virtual Proxy, which creates expensive objects only when necessary; the Protection Proxy, which controls access to an object; and Remote Proxy, which represents objects in a different address space, such as remote objects on a network or web services. However, information proxy is not a common use of the Proxy pattern.

Error:

Error: select the remote proxy, since it was the only one I thought I had not heard of, and consider that the information proxy referred to the chace memory.

4.



What does it mean to "let the subclass decide" in the Factory Method Pattern?

○ a. the subclass will pass a parameter into a factory that determines which object is instantiated

● b. the subclass defines the methods for concrete instantiation. As such, the type of object is determined by which subclass is instantiate ✓

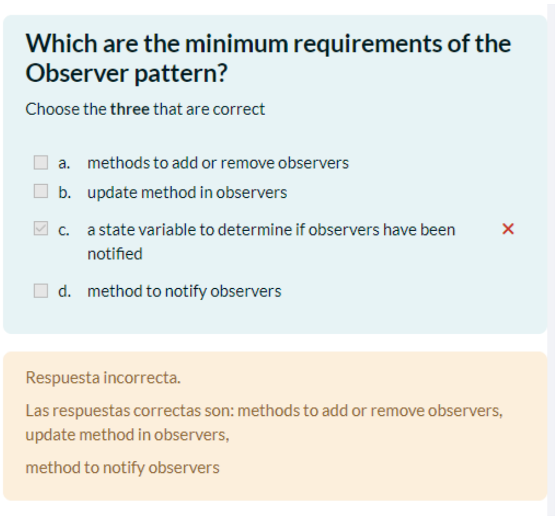
○ c. the subclass decides which object to create, but calls a method that is defined in the superclass to instantiate the class

Respuesta correcta

La respuesta correcta es:
the subclass defines the methods for concrete instantiation. As such, the type of object is determined by which subclass is instantiate

Justification:
Select option b, because in the Factory Method pattern, subclasses define the methods for the specific creation. That is, each specific subclass implements its own factory method to create specific objects.

5.



Which are the minimum requirements of the Observer pattern?

Choose the **three** that are correct

☐ a. methods to add or remove observers

☐ b. update method in observers

☑ c. a state variable to determine if observers have been notified ✗

☐ d. method to notify observers

Respuesta incorrecta.

Las respuestas correctas son: methods to add or remove observers, update method in observers,

method to notify observers

Justification:

Methods for adding or removing observers: The Observer pattern implies that an object the subject, maintains a list of observers interested in its changes. Therefore, it is necessary to have methods to add and remove observers from this list.

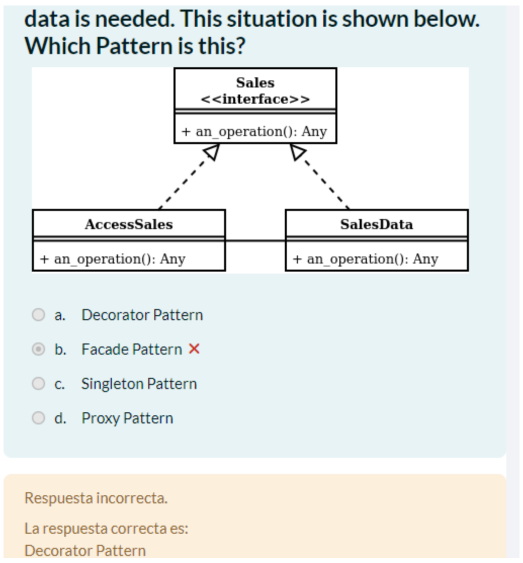
Update method in observers: Observers must have an update method that is called when the subject changes its state. This method allows observers to react to relevant changes.

Method for notifying observers: When the subject changes its status, it must notify all registered observers. Therefore, a method is needed to notify observers about changes.

Error:

I don't know how I could have been wrong because a state variable to determine if the observers have been notified is not something necessary to implement it.

6.



data is needed. This situation is shown below. Which Pattern is this?

a. Decorator Pattern

[✓ b. Facade Pattern ✗]

c. Singleton Pattern

d. Proxy Pattern

Respuesta incorrecta.

La respuesta correcta es:
Decorator Pattern

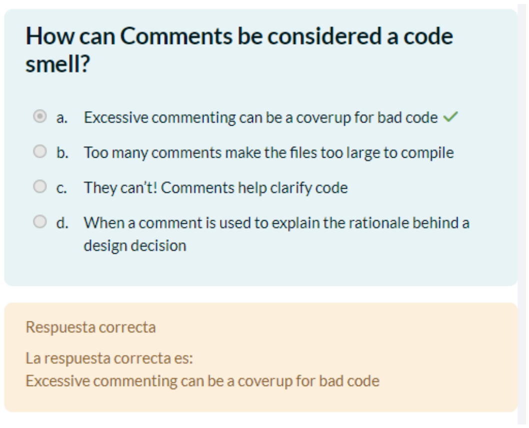
Justification:

The Decorator Pattern is best suited for this case because it allows adding additional functionality to an existing class without modifying its original structure. In other words, you can “decorate” an object with extra features without altering its code base. In this case, the object to decorate is the SalesData class. The pattern allows you to extend the capabilities of SalesData using decorators such as AccessSales, which provides curated sales data based on user credentials.

Error:

I realized that I did not understand the question well, or well I could not translate it correctly, since I took it as if two different calls were made to the interface depending on what we wanted to do.

7.



How can Comments be considered a code smell?

- a. Excessive commenting can be a coverup for bad code ✓ [selected]
- b. Too many comments make the files too large to compile
- c. They can't! Comments help clarify code
- d. When a comment is used to explain the rationale behind a design decision

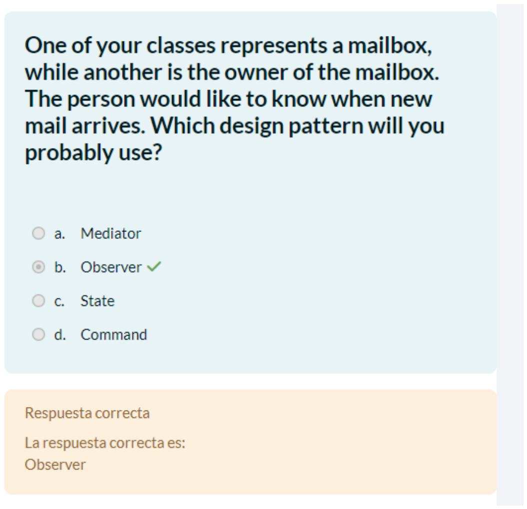
Respuesta correcta

La respuesta correcta es:
Excessive commenting can be a coverup for bad code

Justification:

I select Excessive Commenting, because if a code has too many comments, it is a red flag, as it could be a sign that the code itself is not clear enough. And the programmer, realizing that his code was not readable or self-explanatory, decided to go crazy and explain the code through comments.

8.



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?

- a. Mediator
- b. Observer ✓ [selected]
- c. State
- d. Command

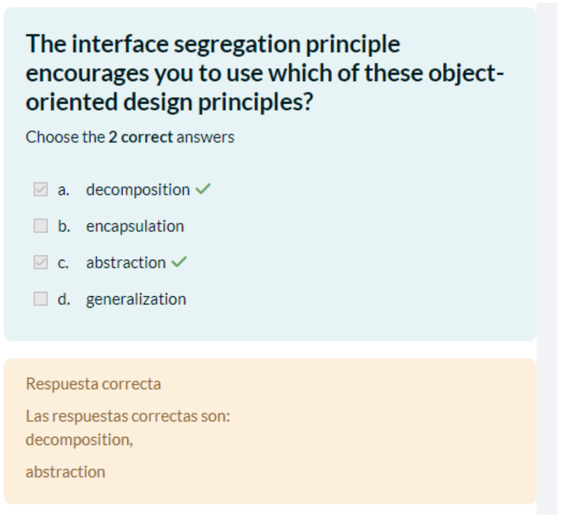
Respuesta correcta

La respuesta correcta es:
Observer

Justification:

The Observer Pattern is the most suitable for this case, since it allows establishing a one-to-many relationship between objects. In this scenario, we have one class that represents a mailbox and another that is the owner of the mailbox. The owner wants to know when new mail arrives in the mailbox. The Observer Pattern allows the owner (observer) to register to receive notifications when the mailbox (subject) changes its state. The mailbox will automatically notify the owner when there are changes.

9.



The interface segregation principle encourages you to use which of these object-oriented design principles?

Choose the **2 correct** answers

- [✓ a. decomposition] ✓
- b. encapsulation
- [✓ c. abstraction] ✓
- d. generalization

Respuesta correcta

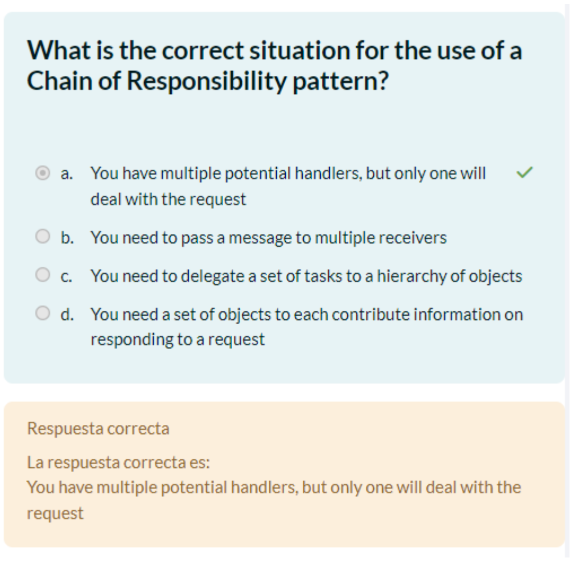
Las respuestas correctas son:
decomposition,

abstraction

Justification:

The Interface Segregation Principle suggests that we should divide large interfaces into smaller, specific parts (decomposition) and create abstract interfaces that are relevant to each client (abstraction). This improves cohesion and prevents classes from implementing unnecessary methods.

10.


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

[✓ a. You have multiple potential handlers, but only one will deal with the request] ✓

b. You need to pass a message to multiple receivers

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

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

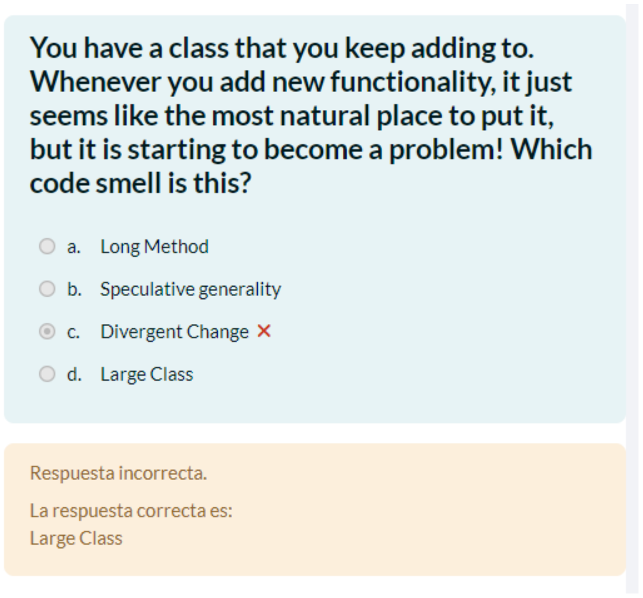
Respuesta correcta

La respuesta correcta es:
You have multiple potential handlers, but only one will deal with the request

Justification:

a, is the correct option and that by having multiple potential handlers, but only one will be in charge of the request, it is generally the case of using the "Chain of Responsibility" design pattern since this is used when you have a chain of objects that can handle a request, and each object in the chain decides whether it can handle the request or should pass it to the next object in the chain.

11.


You have a class that you keep adding to. Whenever you add new functionality, it just seems like the most natural place to put it, but it is starting to become a problem! Which code smell is this?

a. Long Method

b. Speculative generality

[✓ c. Divergent Change] ✕

d. Large Class

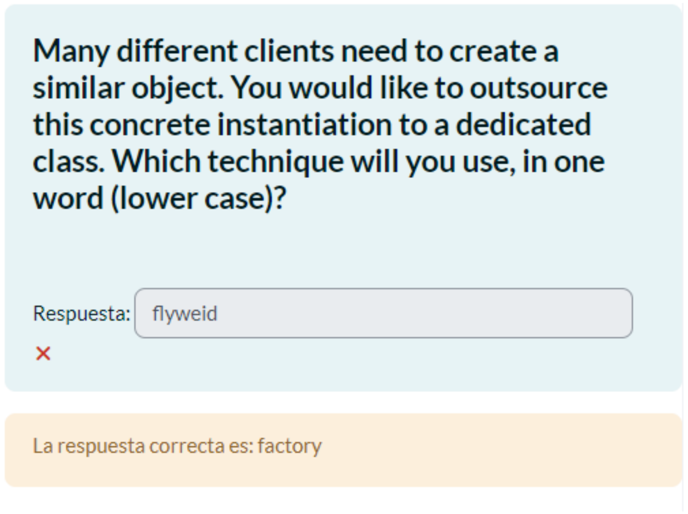
Respuesta incorrecta.

La respuesta correcta es:
Large Class

Justification:

The correct answer is the Large Class odor code. This smell refers to a class that has too many responsibilities and is doing too much. Being that ideally, a class should have only one responsibility (Single Responsibility Principle). When a class becomes large and spans many lines of code, it may be an indicator that it is taking on too many tasks.

12.



Many different clients need to create a similar object. You would like to outsource this concrete instantiation to a dedicated class. Which technique will you use, in one word (lower case)?

Respuesta: flyweid

✗

La respuesta correcta es: factory

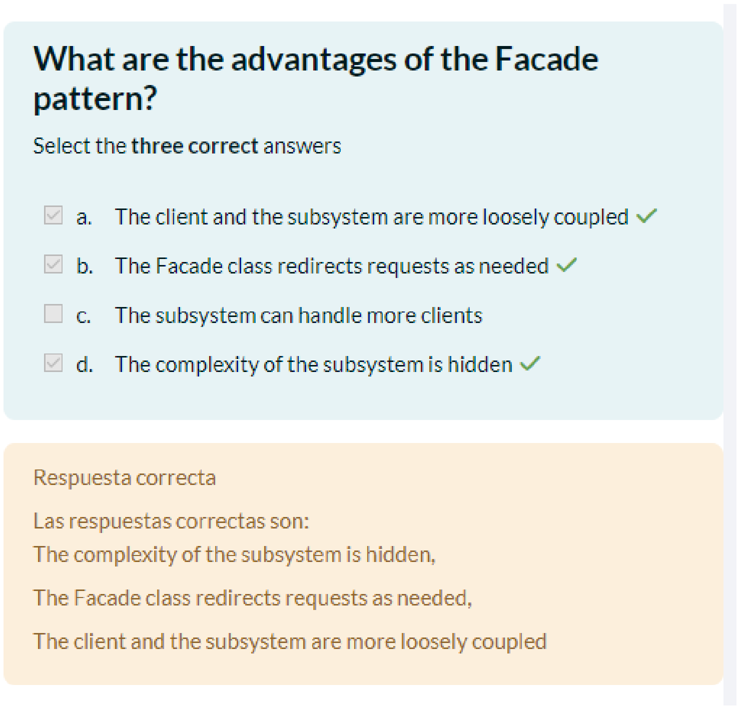
Justification:

The Factory pattern is suitable because it centralizes the creation of similar objects in a single class, simplifying client code and facilitating future changes to the creation logic without modifying the client code. Additionally, it improves code reusability and maintainability.

Error:

Again I couldn't read the question correctly, I thought it referred to reusing common parts.

13.



What are the advantages of the Facade pattern?

Select the **three correct** answers

- [✓] a. The client and the subsystem are more loosely coupled ✓
- [✓] b. The Facade class redirects requests as needed ✓
- [ ] c. The subsystem can handle more clients
- [✓] d. The complexity of the subsystem is hidden ✓

Respuesta correcta

Las respuestas correctas son:
The complexity of the subsystem is hidden,

The Facade class redirects requests as needed,

The client and the subsystem are more loosely coupled

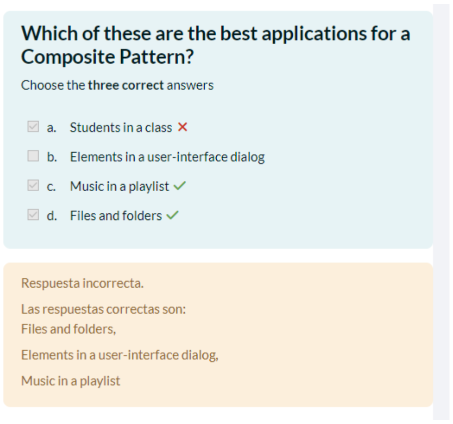
Justification:

The client and the subsystem are more loosely coupled: The Facade pattern reduces the direct dependency between the client and the subsystem, making maintenance easier.

The complexity of the subsystem is hidden: Hides the complexity of the subsystem, presenting a simple interface to the client.

The Facade class redirects requests as needed: Redirects client requests to the correct subsystem components, simplifying interaction.

14.



Which of these are the best applications for a Composite Pattern?

Choose the **three correct** answers

- [✓] a. Students in a class ✗
- [ ] b. Elements in a user-interface dialog
- [✓] c. Music in a playlist ✓
- [✓] d. Files and folders ✓

Respuesta incorrecta.

Las respuestas correctas son:
Files and folders,

Elements in a user-interface dialog,

Music in a playlist

Justification:

Elements in a user-interface dialog: The Composite pattern allows user interface elements to be treated uniformly, whether simple or composite, facilitating the management and manipulation of hierarchical structures.

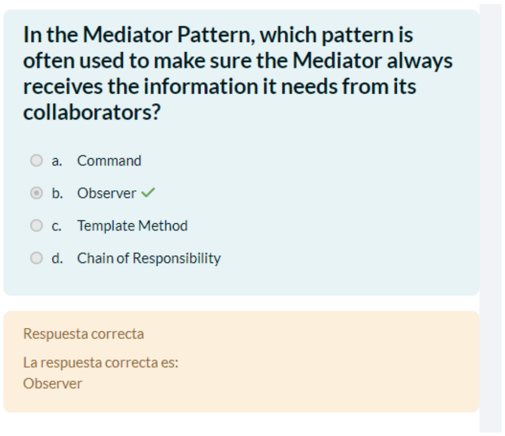
Music in a playlist: The Composite pattern is ideal for playlists, as it allows you to manage both individual songs and groups of songs (playlists) in the same way, simplifying organization and playback.

Files and folders: The Composite pattern is perfect for file systems, as it allows files and folders (which can contain other files and folders) to be treated uniformly, facilitating management operations.

Error:

I thought that because the music list was one of the correct ones, so would the student list, and I didn't want to risk it because of the interface because it was difficult for me to visualize it.

15.



In the Mediator Pattern, which pattern is often used to make sure the Mediator always receives the information it needs from its collaborators?

- a. Command
- [✓ b. Observer] ✓
- c. Template Method
- d. Chain of Responsibility

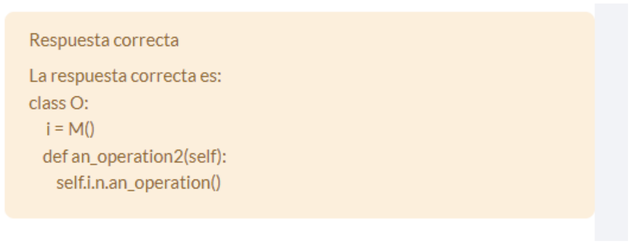
Respuesta correcta

La respuesta correcta es:
Observer

Justification:

It is a Mediator because the Observer pattern is often used to ensure that the Mediator always receives the necessary information from his collaborators. The Observer pattern allows objects (collaborators) to automatically notify the Mediator of any state changes, ensuring that the Mediator is always aware of relevant updates without requiring constant querying. This facilitates centralized communication and coordination without direct coupling between collaborators.

16.



Respuesta correcta

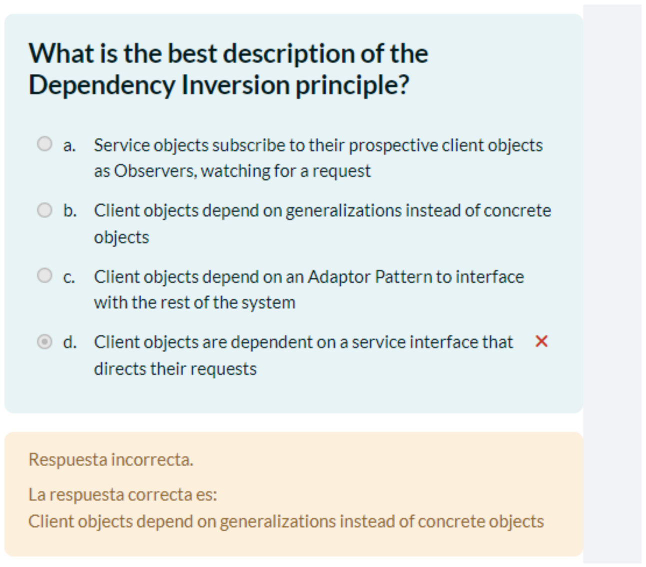
La respuesta correcta es:

```
class O:
  i = M()
  def an_operation2(self):
    self.i.n.an_operation()
```

Justification:

a was the correct option because it violates the Principle of Least Knowledge or Law of Demeter, which states that an object should interact only with its immediate friends and not with internal objects of other objects.

17.



What is the best description of the Dependency Inversion principle?

- a. Service objects subscribe to their prospective client objects as Observers, watching for a request
- b. Client objects depend on generalizations instead of concrete objects
- c. Client objects depend on an Adaptor Pattern to interface with the rest of the system
- [✓ d.] Client objects are dependent on a service interface that directs their requests ✗

Respuesta incorrecta.

La respuesta correcta es:
Client objects depend on generalizations instead of concrete objects

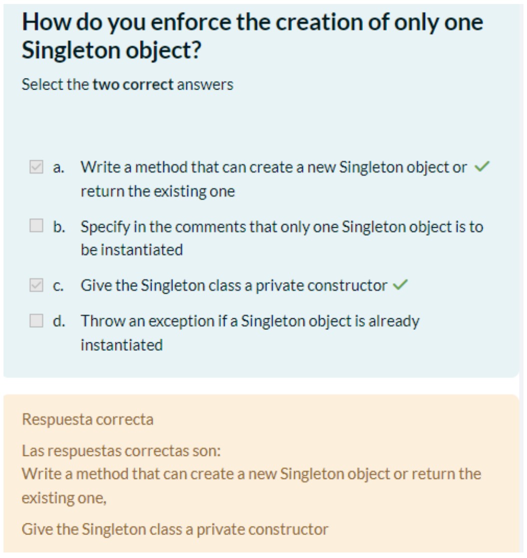
Justification:

The Dependency Inversion Principle states that high-level modules should not depend on low-level modules, but rather both should depend on abstractions (for example, interfaces or abstract classes). This principle also implies that abstractions should not depend on details, but rather that details should depend on abstractions.

Error:

In this one I didn't quite understand what the answers mean xd

18.



How do you enforce the creation of only one Singleton object?

Select the **two correct** answers

- [✓] a. Write a method that can create a new Singleton object or return the existing one ✓
- [ ] b. Specify in the comments that only one Singleton object is to be instantiated
- [✓] c. Give the Singleton class a private constructor ✓
- [ ] d. Throw an exception if a Singleton object is already instantiated

Respuesta correcta

Las respuestas correctas son:
Write a method that can create a new Singleton object or return the existing one,

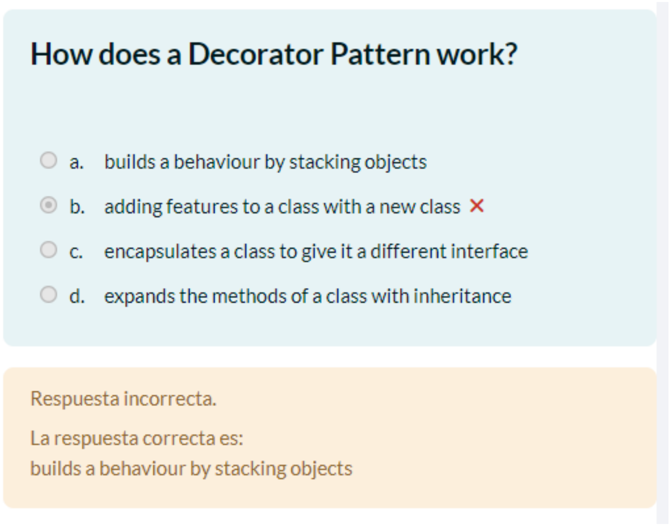
Give the Singleton class a private constructor

Justification:

Write a method that can create a new Singleton object or return the existing one: A static method that handles the creation of the singleton instance.

Give the Singleton class a private constructor: By making the constructor private, you avoid creating instances outside the class.

19.



How does a Decorator Pattern work?

- a. builds a behaviour by stacking objects
- [✓ b.] adding features to a class with a new class ✗
- c. encapsulates a class to give it a different interface
- d. expands the methods of a class with inheritance

Respuesta incorrecta.

La respuesta correcta es:
builds a behaviour by stacking objects

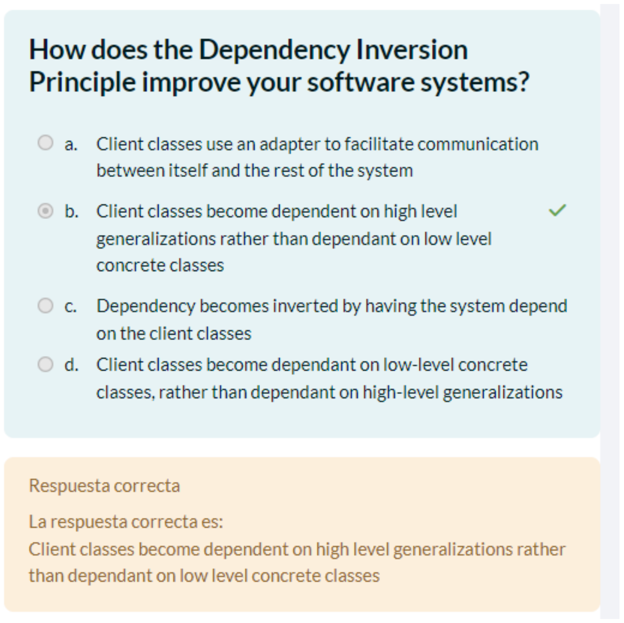
Justification:

El patrón Decorador funciona al apilar objetos que tienen funcionalidades adicionales sobre una clase base. Cada objeto decorador envuelve a otro objeto, proporcionando una funcionalidad adicional sin modificar la interfaz de la clase base. Esto permite la composición flexible de comportamientos, ya que los objetos pueden agregarse o eliminarse dinámicamente para modificar el comportamiento de la clase base.

Error:

I didn't have the concept very clear, and my English failed to interpret well.

20.



How does the Dependency Inversion Principle improve your software systems?

- a. Client classes use an adapter to facilitate communication between itself and the rest of the system
- [✓ b.] Client classes become dependent on high level generalizations rather than dependant on low level concrete classes ✓
- c. Dependency becomes inverted by having the system depend on the client classes
- d. Client classes become dependant on low-level concrete classes, rather than dependant on high-level generalizations

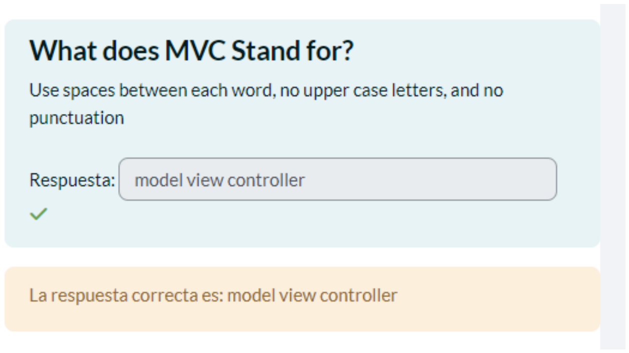
Respuesta correcta

La respuesta correcta es:
Client classes become dependent on high level generalizations rather than dependant on low level concrete classes

Justification:

The Dependency Inversion Principle (DIP) improves software systems by promoting a more flexible and decoupled design. By making client classes depend on high-level generalizations (abstractions), rather than directly depending on low-level concrete classes, the system becomes more modular and easier to maintain. This allows specific implementations to be easily exchanged without modifying the client code, making it easier to adapt the system to future changes and reuse the code.

21.



What does MVC Stand for?

Use spaces between each word, no upper case letters, and no punctuation

Respuesta: model view controller

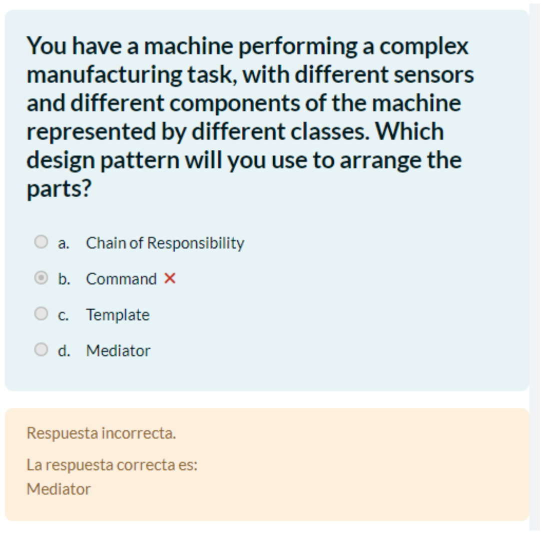
✓

La respuesta correcta es: model view controller

Justification:

without words xd

22.



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?

- a. Chain of Responsibility
- [✓ b. Command] ✗
- c. Template
- d. Mediator

Respuesta incorrecta.

La respuesta correcta es:
Mediator

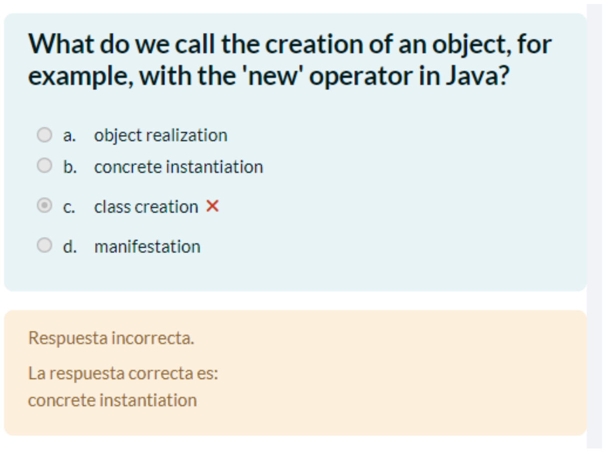
Justification:

The Mediator pattern is suitable for coordinating communication between different components of a complex system, as in this case, where you have different sensors and components of a machine represented by separate classes. The Mediator acts as a centralized intermediary that facilitates the interaction between these components, avoiding direct coupling between them.

Error:

The question confused me a little, but I considered that you could use command to make requests for classifying the pieces

23.


What do we call the creation of an object, for example, with the 'new' operator in Java?

a. object realization
b. concrete instantiation
[✓ c. class creation] ✕
d. manifestation

Respuesta incorrecta.

La respuesta correcta es:
concrete instantiation

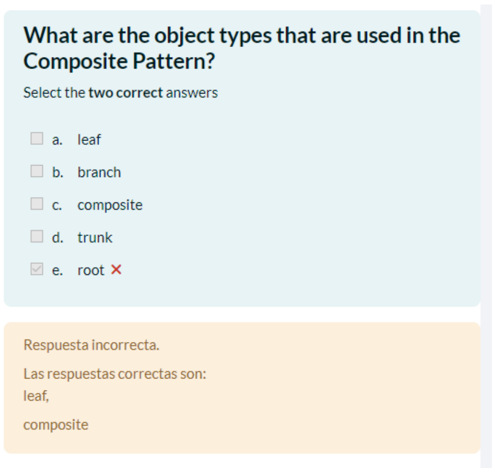
Justification:

The correct term for creating an object, for example, with the 'new' operator in Java, is "concrete instantiation". This refers to the process of creating a specific (concrete) instance of a class at runtime.

Error:

In this case, I have no justification, I screwed up with such an easy question, I don't know if I didn't think it through with the English terms xd

24.


What are the object types that are used in the Composite Pattern?

Select the **two correct** answers

a. leaf
b. branch
c. composite
d. trunk
[✓ e. root] ✕

Respuesta incorrecta.

Las respuestas correctas son:
leaf,

composite

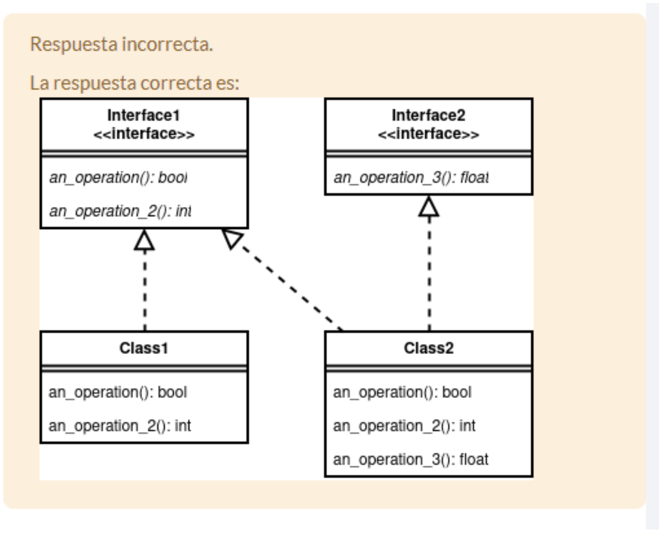
Justification:

In the Composite pattern, two types of objects are used: leaves and composites. Leaves represent the individual elements in the hierarchical structure, while compounds represent nodes that may contain other objects, including leaf objects and other compounds.

Error:

In this case I did not remember the term "leaf", and decided to go with the tree term that I remembered "root".

25.



Respuesta incorrecta.

La respuesta correcta es:

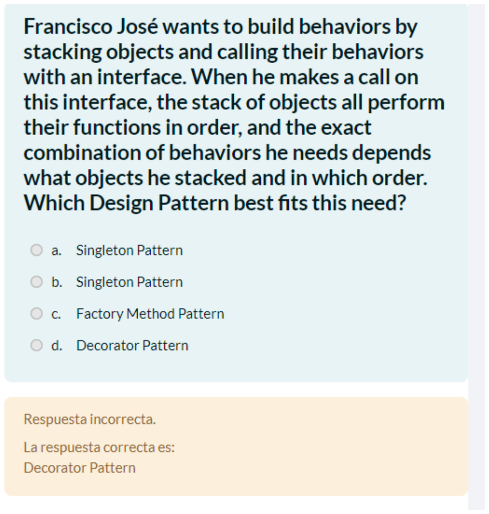
Justification:

The correct answer is option b because it shows the segregation of the interface into two separate interfaces, Interface1 and Interface2, each with specific methods that serve the needs of the classes that implement them. This approach follows the Interface Segregation Principle (ISP), which states that clients should not depend on interfaces they do not use, reducing overhead and improving code cohesion and maintainability.

Error:

I chose option d, which forces classes to implement methods they do not need, contravening the ISP. Which creates unnecessary dependencies and can lead to increased complexity and the implementation of empty or non-functional methods, reducing efficiency and design clarity.

26.


Francisco José wants to build behaviors by stacking objects and calling their behaviors with an interface. When he makes a call on this interface, the stack of objects all perform their functions in order, and the exact combination of behaviors he needs depends what objects he stacked and in which order. Which Design Pattern best fits this need?

- a. Singleton Pattern
- b. Singleton Pattern
- c. Factory Method Pattern
- d. Decorator Pattern

Respuesta incorrecta.

La respuesta correcta es:
Decorator Pattern

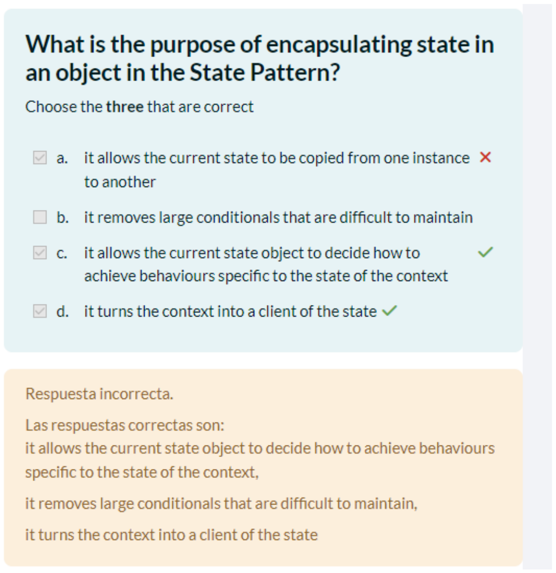
Justification:

The Decorator pattern best fits Franz Joseph's need to construct behaviors by stacking objects and calling their behaviors using an interface. In this pattern, multiple decorator objects can be stacked, each adding additional functionality to the chain of objects. When a method is called on the interface, all objects in the chain execute their functions in order, and the exact combination of behaviors depends on the stacked objects and their order.

Error:

I cannot understand this question from the translation and decided not to answer.

27.


What is the purpose of encapsulating state in an object in the State Pattern?

Choose the **three** that are correct

- [✓] a. it allows the current state to be copied from one instance to another ✗
- [ ] b. it removes large conditionals that are difficult to maintain
- [✓] c. it allows the current state object to decide how to achieve behaviours specific to the state of the context ✓
- [✓] d. it turns the context into a client of the state ✓

Respuesta incorrecta.

Las respuestas correctas son:
it allows the current state object to decide how to achieve behaviours specific to the state of the context,

it removes large conditionals that are difficult to maintain,

it turns the context into a client of the state

Justification:

b. Remove large conditionals that are difficult to maintain: Eliminates long and complicated conditionals, improving code maintainability.

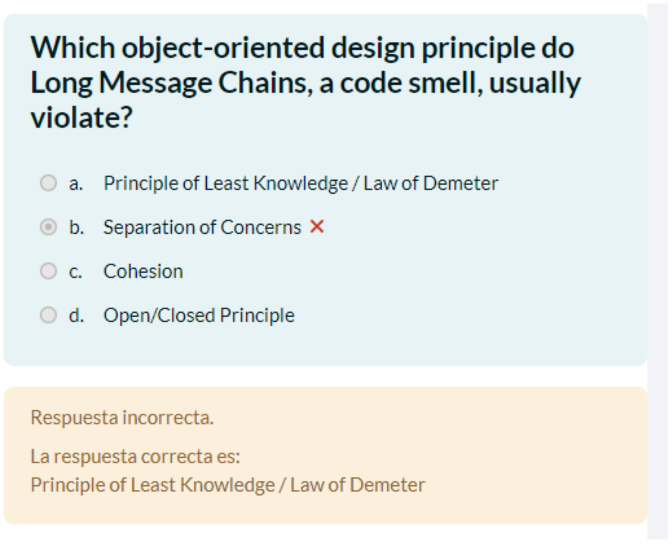
c. Allow the current state object to decide how to achieve behaviors specific to the state of the context: Allow the current state object to determine how to achieve specific behaviors depending on the state of the context, facilitating flexible design.

d. Turn the context into a client of the state: The context becomes a client of the state, which separates responsibilities and allows the context to focus on its core functionality without worrying about state implementation details.

Error:

I didn't understand option b very well, and despite my doubts I chose option a (bad option)

28.



Which object-oriented design principle do Long Message Chains, a code smell, usually violate?

a. Principle of Least Knowledge / Law of Demeter

[✓ b. Separation of Concerns] ✗

c. Cohesion

d. Open/Closed Principle

Respuesta incorrecta.

La respuesta correcta es:
Principle of Least Knowledge / Law of Demeter

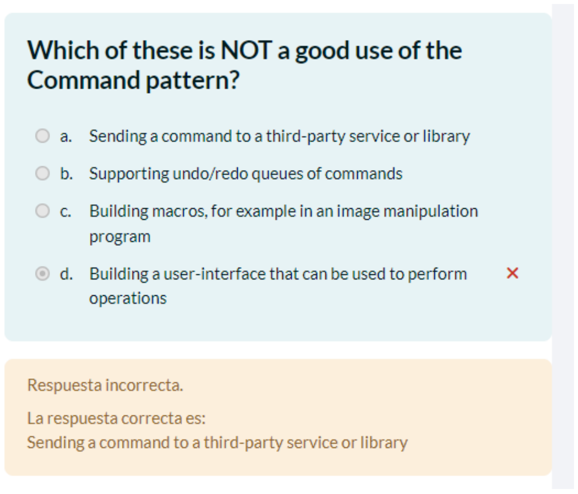
Justification:

The Long Message Chains violate the Principle of Least Knowledge or Law of Demeter, which states that an object should interact only with its immediate friends and not with internal objects of other objects. Long message chains imply excessive dependency between objects, indicating that one object knows too much about the internal structure of other objects. This can result in overcoupling and loss of encapsulation, making system maintenance and evolution difficult.

Error:

I thought about separation of interests since this divides the system into several modules, but in this case, little to do with it xd

29.



Which of these is NOT a good use of the Command pattern?

- a. Sending a command to a third-party service or library
- b. Supporting undo/redo queues of commands
- c. Building macros, for example in an image manipulation program
- [✓ d.] Building a user-interface that can be used to perform operations ✕

Respuesta incorrecta.

La respuesta correcta es:
Sending a command to a third-party service or library

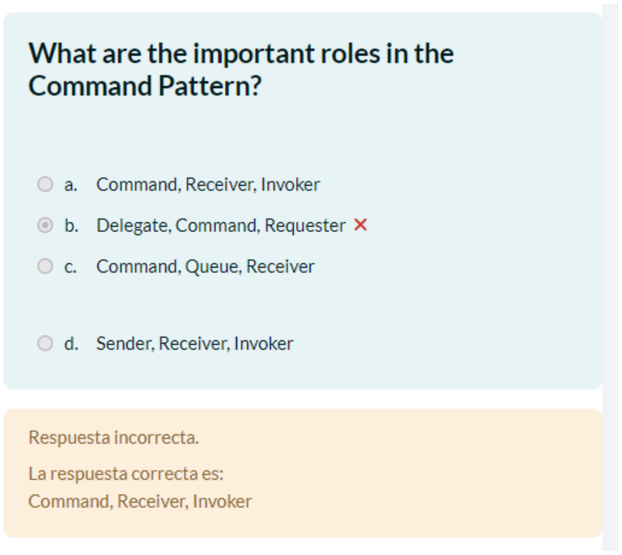
Justification:

The Command pattern is not typically used to send commands to external services or third-party libraries, as it is designed to manage internal application operations, such as supporting undo/redo, building macros, and handling the user interface. Other patterns, such as the Adapter pattern or the Facade pattern, are more appropriate for interacting with external services.

Error:

Because I didn't see it very clearly implemented for creating a user interface, I decided to put that option.

30.



What are the important roles in the Command Pattern?

- a. Command, Receiver, Invoker
- [✓ b.] Delegate, Command, Requester ✕
- c. Command, Queue, Receiver
- d. Sender, Receiver, Invoker

Respuesta incorrecta.

La respuesta correcta es:
Command, Receiver, Invoker

Justification:

In the Command pattern, the key roles are:

Command: Represents a request as an object, encapsulating both the action and its parameters.

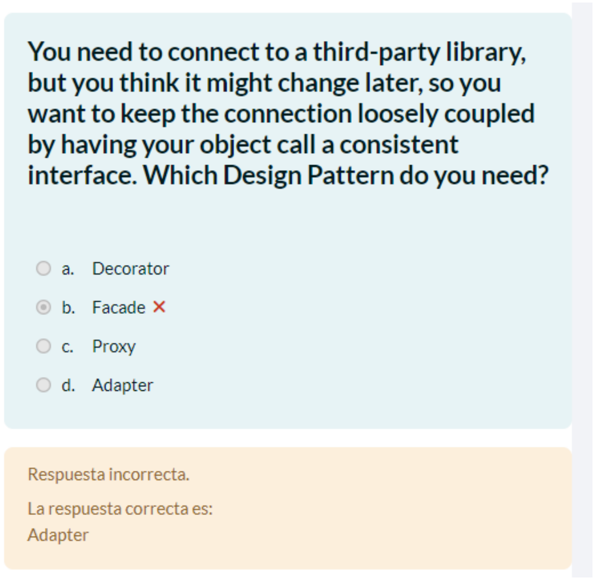
Receiver: It is responsible for carrying out the action requested by the command. It can be any object that has the logic necessary to perform the operation.

Invoker: It is responsible for executing commands. Maintains a reference to the command and executes it when necessary. It can be an object that controls the script or a user interface that interacts with the user to execute the commands.

Error:

I wasn't clear what the roles were.

31.



You need to connect to a third-party library, but you think it might change later, so you want to keep the connection loosely coupled by having your object call a consistent interface. Which Design Pattern do you need?

a. Decorator

[✓ b. Facade] ✗

c. Proxy

d. Adapter

Respuesta incorrecta.

La respuesta correcta es:
Adapter

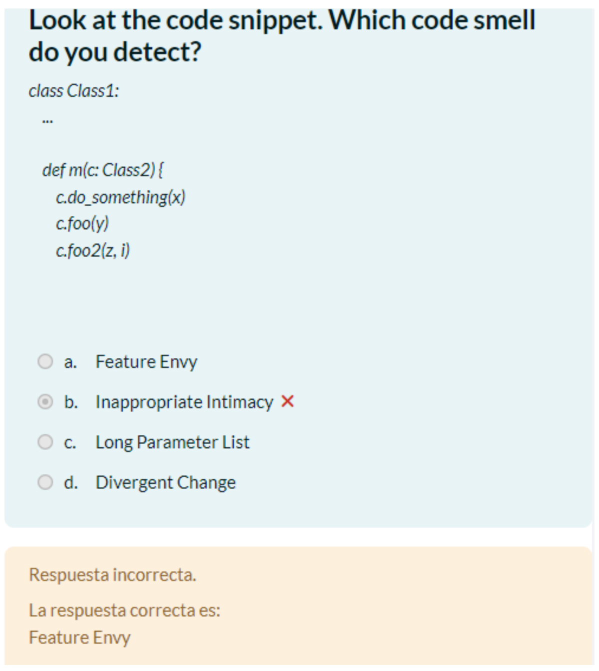
Justification:

To connect an application to a third-party library but wanting to keep the coupling loose because it is believed that the library could change in the future, the Adapter pattern is necessary, since this allows us to adapt the interface of the third-party library to an interface consistent that your object can call transparently. This way, the application object can communicate with the library indirectly through a consistent interface, and if the library changes, only the adapter will need to be adjusted instead of the entire application.

Error:

I didn't understand this point very well because of the translation, but I thought that by using a facade it could be avoided that if the code changed later it would not affect the operation.

32.



Look at the code snippet. Which code smell do you detect?

```
class Class1:
  ...

  def m(c: Class2) {
    c.do_something(x)
    c.foo(y)
    c.foo2(z, i)
```

- ○ a. Feature Envy
- [✓ b. Inappropriate Intimacy] ✗
- ○ c. Long Parameter List
- ○ d. Divergent Change

Respuesta incorrecta.

La respuesta correcta es:
Feature Envy

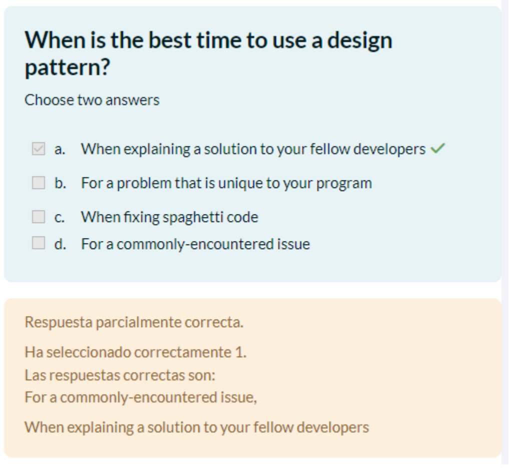
Justification:

Feature Envy code smell refers to a situation where a method appears to be more interested in the attributes or methods of another class than its own. In the code, the method m of the class Class1 overuses the methods (do_something, foo, foo2) and attributes of the class Class2, suggesting that m should be located in Class` instead of Class1. Which indicates a lack of cohesion in the code design and may be an indicator of a better distribution of responsibilities between classes.

Error:

I thought it might be Inappropriate Intimacy, due to so many calls to Class2.

33.


When is the best time to use a design pattern?

Choose two answers

[✓ a. When explaining a solution to your fellow developers] ✓

b. For a problem that is unique to your program

c. When fixing spaghetti code

d. For a commonly-encountered issue

Respuesta parcialmente correcta.

Ha seleccionado correctamente 1.

Las respuestas correctas son:

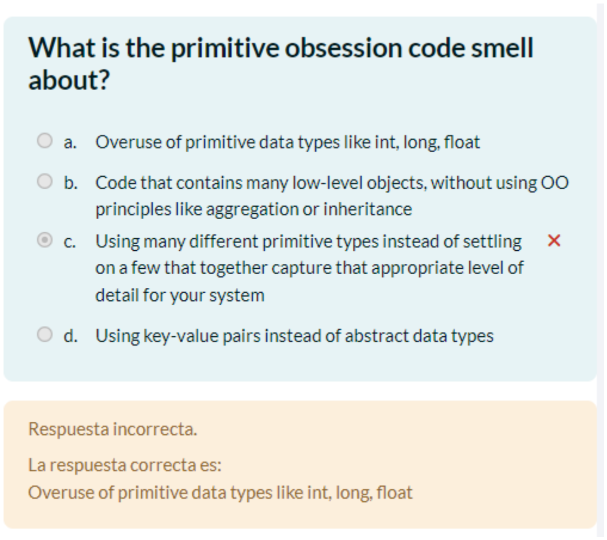
For a commonly-encountered issue,

When explaining a solution to your fellow developers

Justification:

Design patterns are tested and documented solutions to common problems in software design. Therefore, it is best to use a design pattern when we are faced with a problem that is commonly encountered in software development.

34.


What is the primitive obsession code smell about?

a. Overuse of primitive data types like int, long, float

b. Code that contains many low-level objects, without using OO principles like aggregation or inheritance

[✓ c. Using many different primitive types instead of settling on a few that together capture that appropriate level of detail for your system] ✗

d. Using key-value pairs instead of abstract data types

Respuesta incorrecta.

La respuesta correcta es:

Overuse of primitive data types like int, long, float

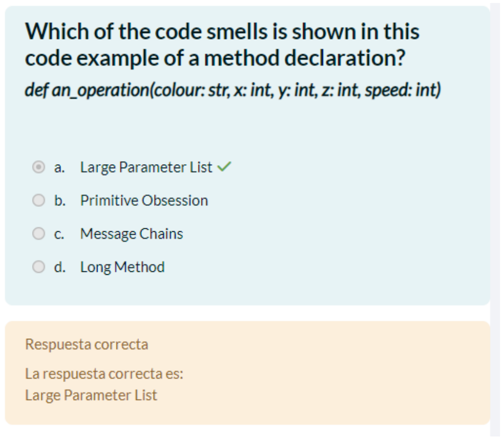
Justification:

Primitive obsession code smell refers to the overuse of primitive data types such as int, long, float, etc., instead of encapsulating related logic in classes or objects with specific semantics. This can lead to code that is difficult to understand, maintain, and extend, since related logic is scattered throughout the code and is not encapsulated in classes that represent domain concepts more clearly and expressively.

Error:

I was not clear about the concept of primitive obsession.

35.



Which of the code smells is shown in this code example of a method declaration?

def an_operation(colour: str, x: int, y: int, z: int, speed: int)

[✓ a. Large Parameter List ✓]
b. Primitive Obsession
c. Message Chains
d. Long Method

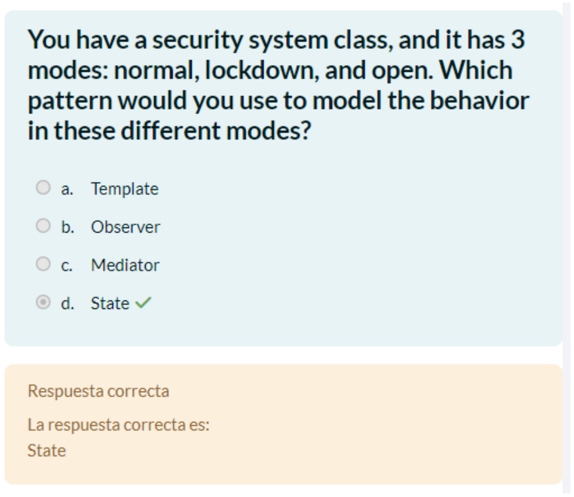
Respuesta correcta

La respuesta correcta es:
Large Parameter List

Justification:

The Large Parameter List code smell refers to methods that have a long list of parameters. In the example provided, the an_operation method has five parameters (color, x, y, z, speed), which can make it difficult to understand and maintain. Having a long list of parameters can indicate a lack of cohesion in the method design and can make the code less readable and more error-prone.

36.



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

a. Template
b. Observer
c. Mediator
[✓ d. State ✓]

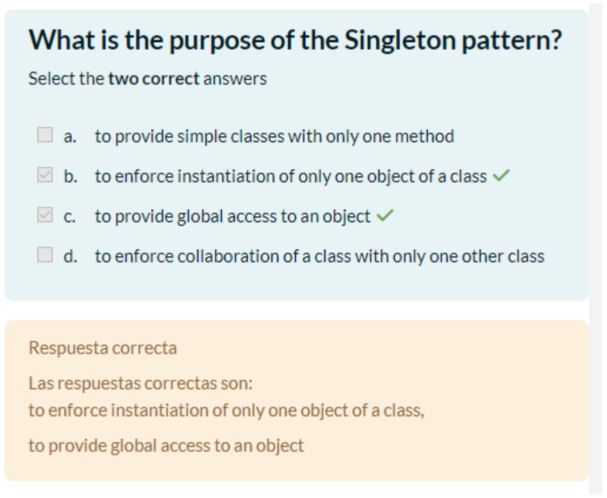
Respuesta correcta

La respuesta correcta es:
State

Justification:

The State pattern is suitable for modeling behavior in different states of an object. In this case, the security system has three different modes: normal, lock and open. Each of these modes represents a different state that the security object can be in. Using the State pattern, separate classes can be defined for each state (normal, blocking, open), where each class implements the specific behavior associated with that state.

37.



What is the purpose of the Singleton pattern?

Select the **two correct** answers

- [ ] a. to provide simple classes with only one method
- [✓] b. to enforce instantiation of only one object of a class ✓
- [✓] c. to provide global access to an object ✓
- [ ] d. to enforce collaboration of a class with only one other class

Respuesta correcta

Las respuestas correctas son:
to enforce instantiation of only one object of a class,

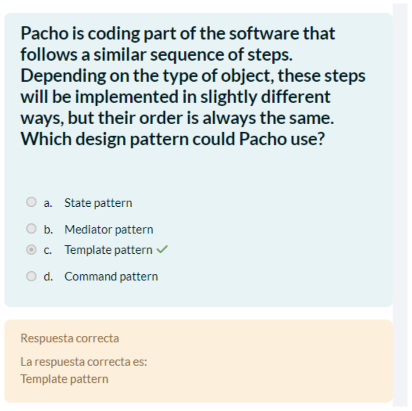
to provide global access to an object

Justification:

to enforce instantiation of only one object of a class: The Singleton pattern is used to ensure that a class has only one instance and provides a global access point to that instance.

to provide global access to an object: In addition to ensuring that there is only one instance of the class, the Singleton also provides a mechanism to globally access that instance. This allows different application components to access the same instance of the Singleton at any time and from anywhere in the code.

38.



Pacho 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 Pacho use?

- a. State pattern
- b. Mediator pattern
- [✓ c. Template pattern] ✓
- d. Command pattern

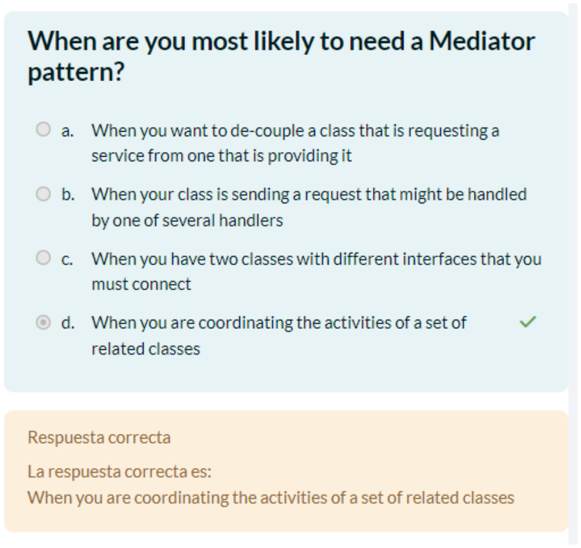
Respuesta correcta

La respuesta correcta es:
Template pattern

Justification:

The Template pattern is ideal for situations where a similar sequence of steps is followed, but implementation details may vary depending on the type of object. This allows Pacho to define a common structure for steps in a base class and allow subclasses to implement specific details as needed.

39.



When are you most likely to need a Mediator pattern?

- a. When you want to de-couple a class that is requesting a service from one that is providing it
- b. When your class is sending a request that might be handled by one of several handlers
- c. When you have two classes with different interfaces that you must connect
- [✓ d. When you are coordinating the activities of a set of related classes] ✓

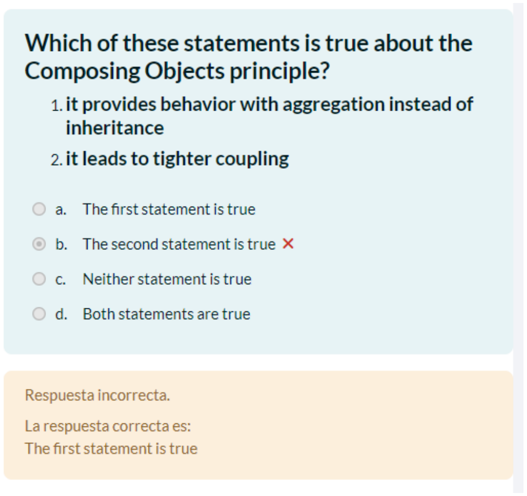
Respuesta correcta

La respuesta correcta es:
When you are coordinating the activities of a set of related classes

Justification:

The correct answer is When you are coordinating the activities of a set of related classes, because the Mediator pattern is used to manage and centralize communication between multiple related classes, avoiding direct dependencies and facilitating the coordination of their activities. This reduces complexity and improves the modularity of the system.

40.



Which of these statements is true about the Composing Objects principle?

1. it provides behavior with aggregation instead of inheritance
2. it leads to tighter coupling

- a. The first statement is true
- [✓ b. The second statement is true] ✗
- c. Neither statement is true
- d. Both statements are true

Respuesta incorrecta.

La respuesta correcta es:
The first statement is true

Justification:

The correct answer is because the principle of Composing Objects refers to the composition of objects to provide behavior through aggregation rather than inheritance. This promotes code reuse and flexibility by allowing objects to be combined in different ways without the restrictions of a rigid inheritance hierarchy. On the other hand, compounding generally leads to lower coupling, not higher coupling, which makes the second statement incorrect.

Error:

I didn't understand this point well, and I just put the answer for the sake of putting it.