



Answers to Good Morning Quizzes

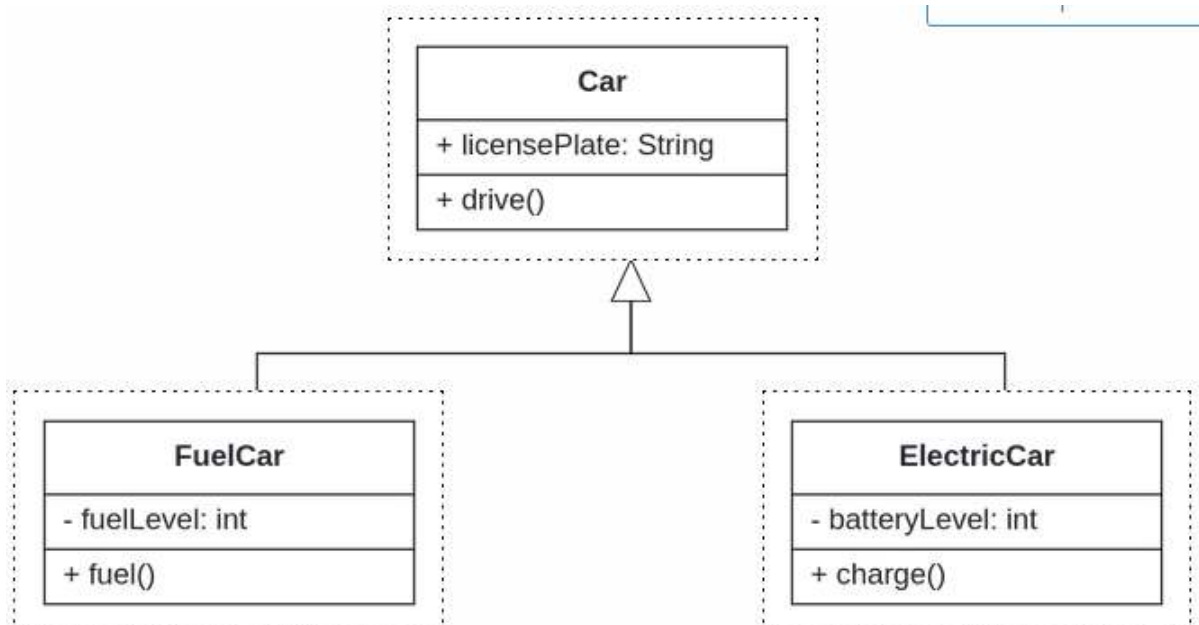
Einführung in die Softwaretechnik (IN0006) (Technische Universität München)

Techniques, methodologies or tools?

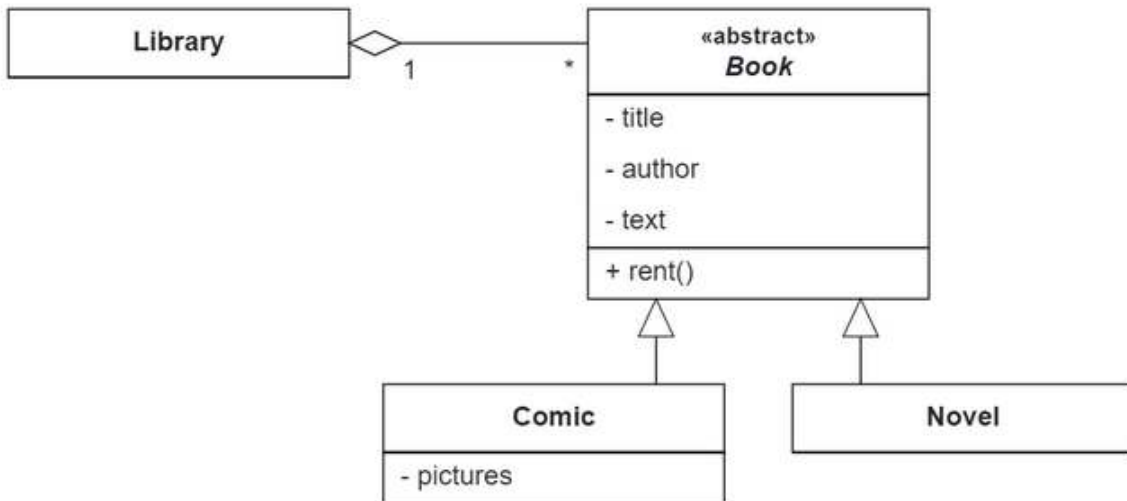
Functional decomposition → Technique	❗ Explanation	Wrong
Insertion sort algorithm → Methodology	❗ Explanation	Wrong
Source code editor → Tool	❗ Explanation	Correct

Abstraction

Abstraction is one of the necessary methodologies that have to be utilized when dealing with complex systems. This is because complex systems are hard to deal with. One example is, when we have a collection of objects. By providing a structure, a superclass with common behaviour and subclasses, which share the common behaviour in the superclass, but also differ from each other, we create a system that could be more easily operated with. Assign the given classes to the empty spaces, so that you create such a system.



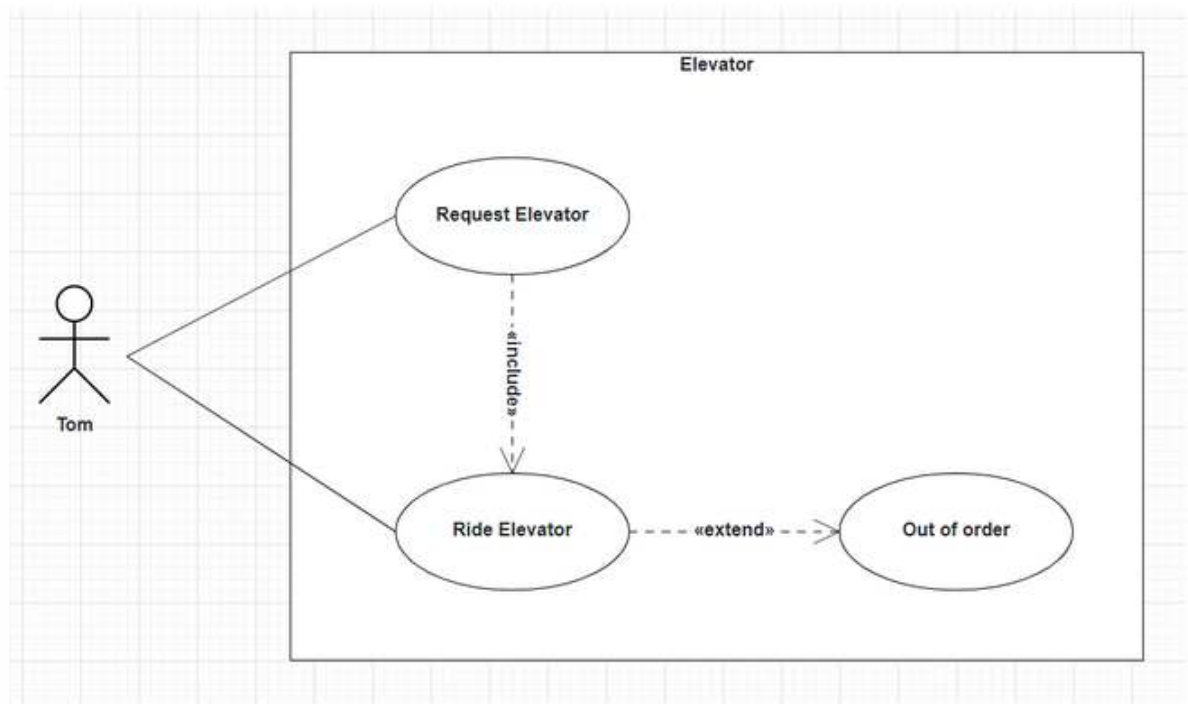
Modeling



Please choose all correct answer options

Answer		Solution	You
Comic is a sub-class of Book	! Explanation	Correct	<input checked="" type="checkbox"/>
Novels and Comics share all of the same attributes	! Explanation	Wrong	<input type="checkbox"/>
Book cannot be instantiated	! Explanation	Correct	<input checked="" type="checkbox"/>
Books are stored in a Library	! Explanation	Correct	<input checked="" type="checkbox"/>

Use case diagram



Please choose all correct answer options

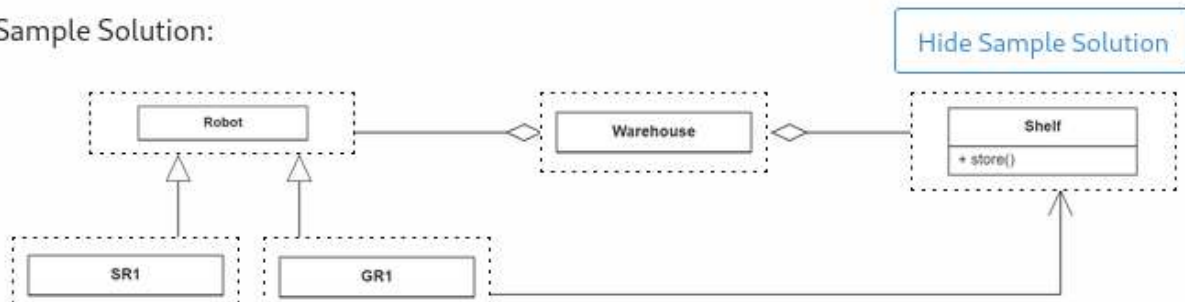
Answer		Solution	You
The extend relation has the wrong direction	! Explanation	Correct	<input checked="" type="checkbox"/>
The include relation has the wrong direction	! Explanation	Correct	<input type="checkbox"/>
Tom is a too specific actor, it should be more generalized	! Explanation	Correct	<input checked="" type="checkbox"/>
Tom should not have an association with Ride Elevator	! Explanation	Wrong	<input type="checkbox"/>
The use cases should be placed outside of the system boundary	! Explanation	Wrong	<input type="checkbox"/>

Analysis Object Model

Read the problem statement carefully and fill the empty spaces in the UML diagram by dragging and dropping the elements below the diagram into the correct places.

Problem statement: *GR1* is a new series of robots. They are used in warehouses along with other series of robots, such as *SR1*. The *GR1* series are storing packages on shelves in the warehouses.

Sample Solution:



Software Requirements

You have talked to a client who wants you to design an online banking software for him. During the meeting you wrote down which requirements the client wants, but you forgot to add the different requirement types. Before you can send the client a contract, you have to assign each requirement to the correct type. Drag and Drop each requirement category to the correct requirement description. Not every available option has to be assigned!

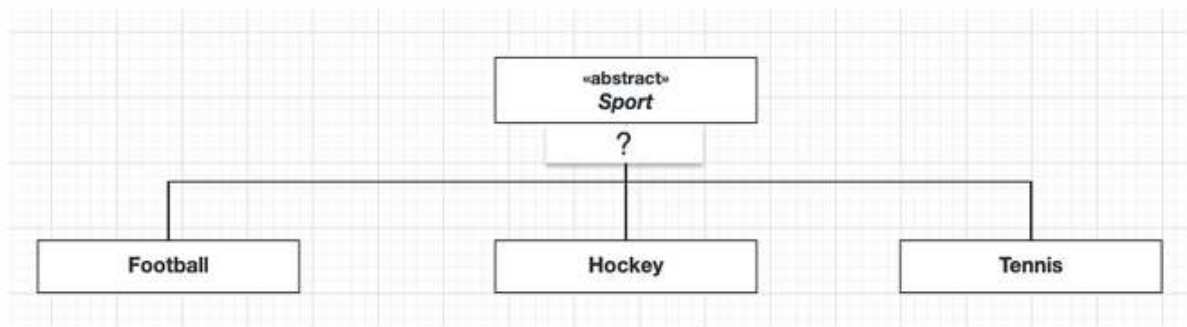
Your Submission:

Show Sample Solution

Description	Requirement Type
Loading the website should not take longer than 1s.	Performance
A user should not be able to input SQL statements to avoid injection attacks.	Security
A user is able to transfer money to another user in the application.	Functionality
The application should be written in Java.	Constraint

UML associations

What type of association would fit best for the relationship between the objects in this UML diagram?



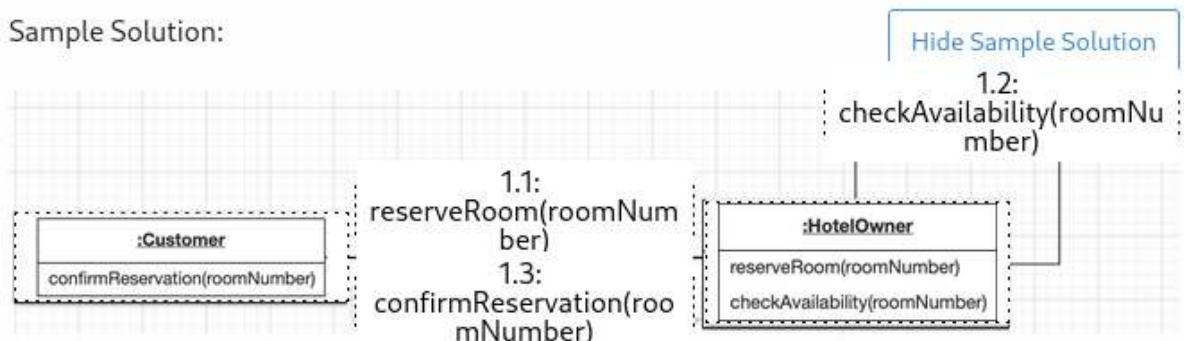
Please choose all correct answer options

Answer		Solution	You
Aggregation	❗ Explanation	Wrong	<input type="checkbox"/>
Composition	❗ Explanation	Wrong	<input type="checkbox"/>
Inheritance	❗ Explanation	Correct	<input checked="" type="checkbox"/>

Communication Diagram

You are the owner of a hotel and want to model the reservation process for a room with a communication diagram. The whole reservation process only consists of the 3 steps below. Fill the empty spaces in the communication diagram by dragging and dropping the elements into the correct places.

Sample Solution:



Architectural styles

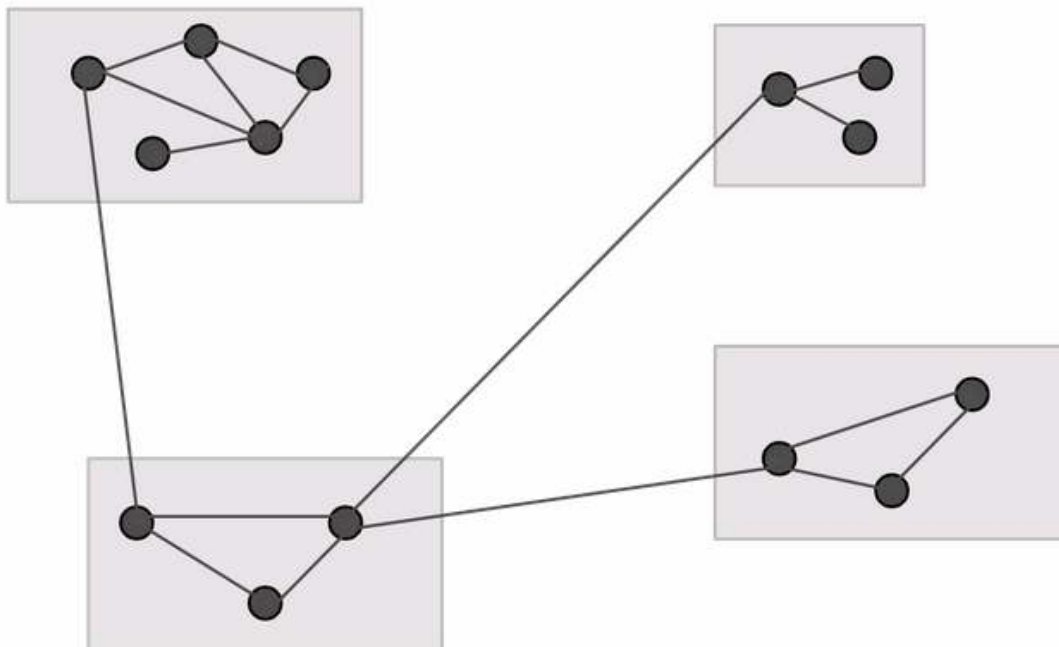
You are creating an application to trade and monitor different stocks for a client using the layered architectural style.

Because stock prices can change drastically within seconds the client requests real-time operations support and thus you chose the *open* architectural style.

As a result, there is a high *coupling* of different subsystems.

Coupling and Cohesion

Take a look at the following simplified component diagram and decide what can be said about coupling and cohesion. Circles symbolize classes, squares symbolize subsystems and lines show interactions between two classes

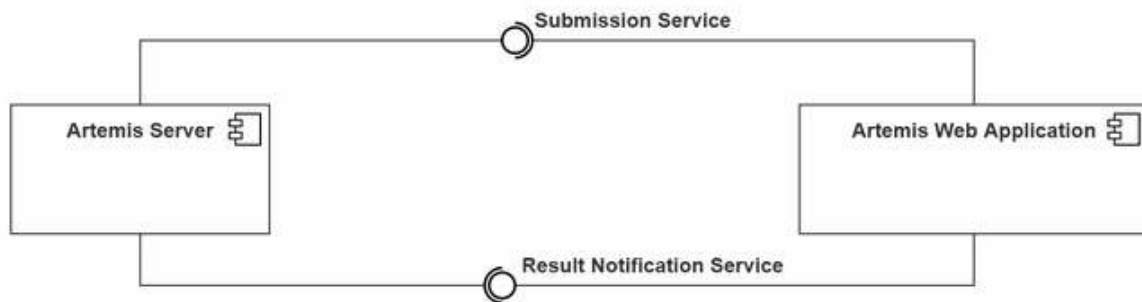


Please choose all correct answer options

Answer		Solution	You
High cohesion	Explanation	Correct	<input checked="" type="checkbox"/>
Low cohesion		Wrong	<input type="checkbox"/>
High coupling		Wrong	<input type="checkbox"/>
Low coupling	Explanation	Correct	<input checked="" type="checkbox"/>

Architectural Styles

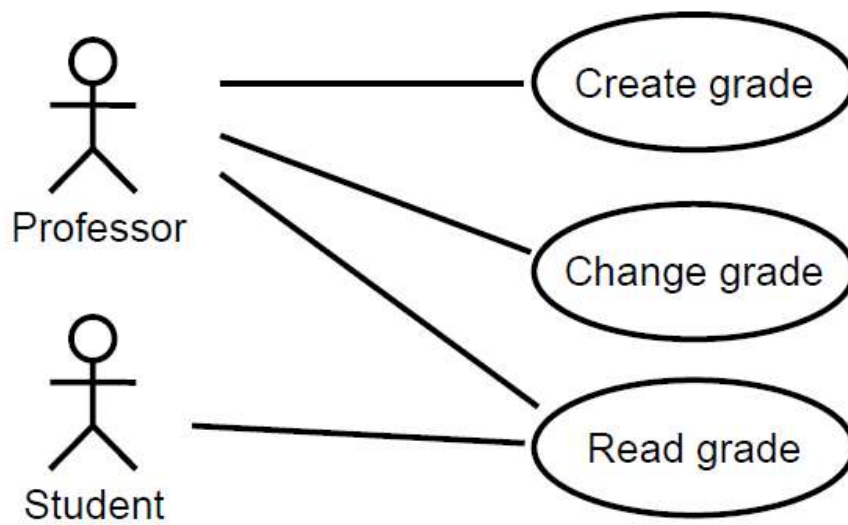
Which architectural style is used based on the following component diagram? Only one answer is correct!



Please choose all correct answer options

Answer		Solution		You
Peer to peer architectural style	! Explanation	Correct	!	<input type="checkbox"/>
Client server architectural style	! Explanation	Wrong	!	<input checked="" type="checkbox"/>
Layered architectural style	! Explanation	Wrong		<input type="checkbox"/>

Access matrix



❗ Explanation

Your Submission:

Show Sample

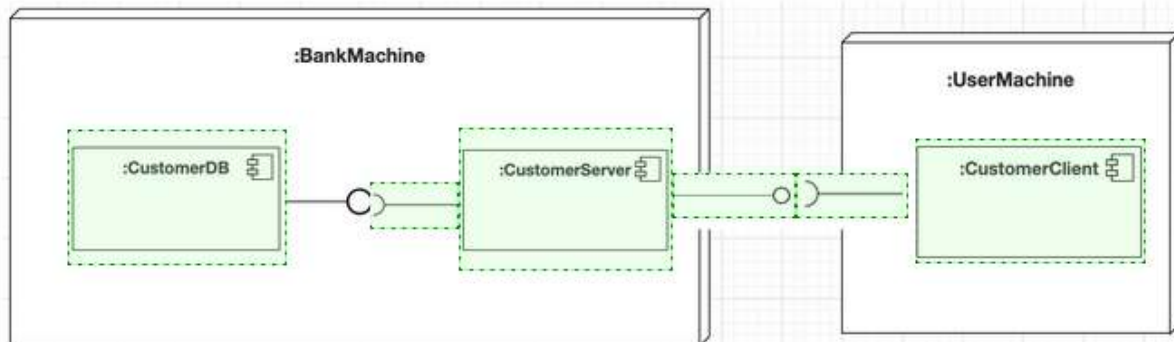
	Grade
Student	read()
Professor	change()
	read()
	<<create>>

Deployment Diagram

You are designing a deployment diagram for a banking system. The system on the side of the bank has a database, where all the credentials of the client are saved (such as username, password, etc.). It also includes a server that accesses the database when a Client wants to login over the website, provided from the server. Drag and drop the model elements to the correct locations.

Your Submission:

[Show Sample Solution](#)



Reuse

Implementation Inheritance, Delegation, Specification Inheritance

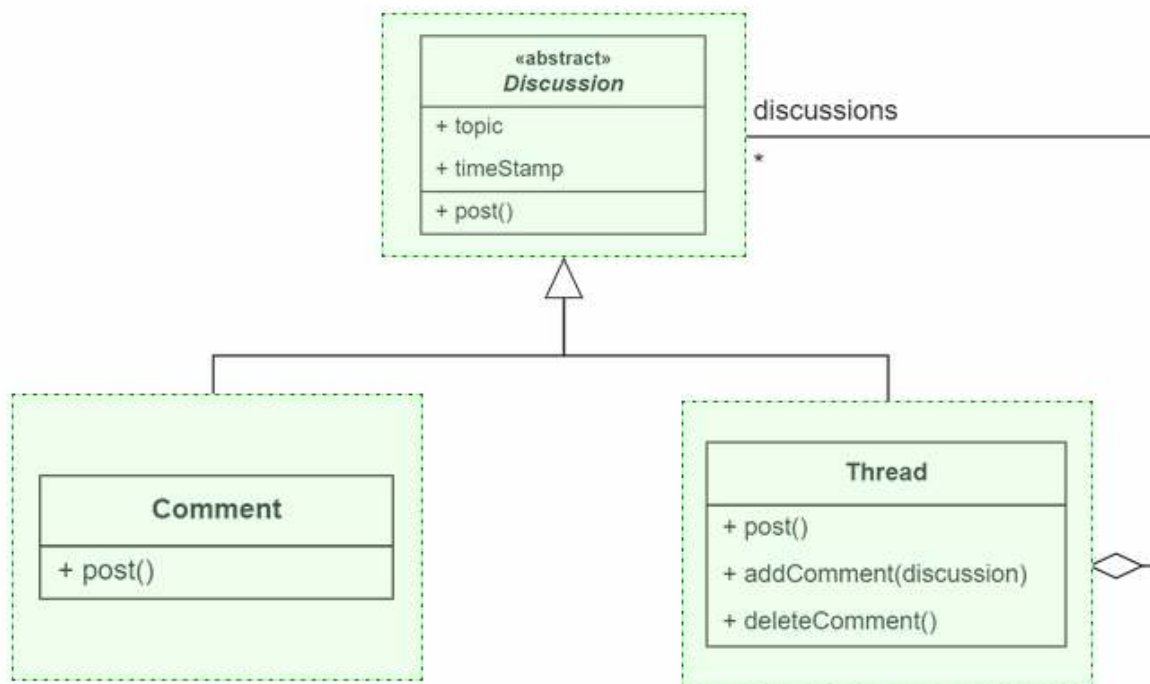
In Bumpers, there is the already implemented superclass **Car**, containing the methods **drive()** and **accelerate()**. During the development process the Client wants you to add the two subclasses **FastCar** and **SlowCar**. Both new classes are the same as **Car**, but have some additional specifications. Which concept of reuse should you apply?

Please choose all correct answer options

Answer		Solution	You
Implementation Inheritance	❗ Explanation	Correct	<input checked="" type="checkbox"/>
Delegation	❗ Explanation	Wrong	<input type="checkbox"/>
Specification Inheritance	❗ Explanation	Wrong	<input type="checkbox"/>

Composite pattern

In the university app, the students should be able to write comments and start threads about certain topics. You told a friend that is not studying with you about this problem statement and you two decided to realize this app. Your friend was responsible for modeling the comment section of a generic course using the Composite Pattern. Unfortunately, after a year of lockdown, he saw his chance and took the first plane to Mallorca before he was able to finish it and asks for your help. For each empty spot, allocate the appropriate class in order to follow the structure of the Composite Pattern. Not every class is needed.



Design Patterns

A company running warehouses is considering renewing its ordering system. Due to the high volume of orders, the system can't be taken offline for the newly developed system to be introduced. The source code is also lost. Which design pattern should be used to solve this particular problem?

Please choose all correct answer options

Answer		Solution	You
Adapter Pattern	! Explanation	Correct	<input checked="" type="checkbox"/>
Bridge Pattern	! Explanation	Wrong	<input type="checkbox"/>
Strategy Pattern	! Explanation	Wrong	<input type="checkbox"/>
Composite Pattern	! Explanation	Wrong	<input type="checkbox"/>

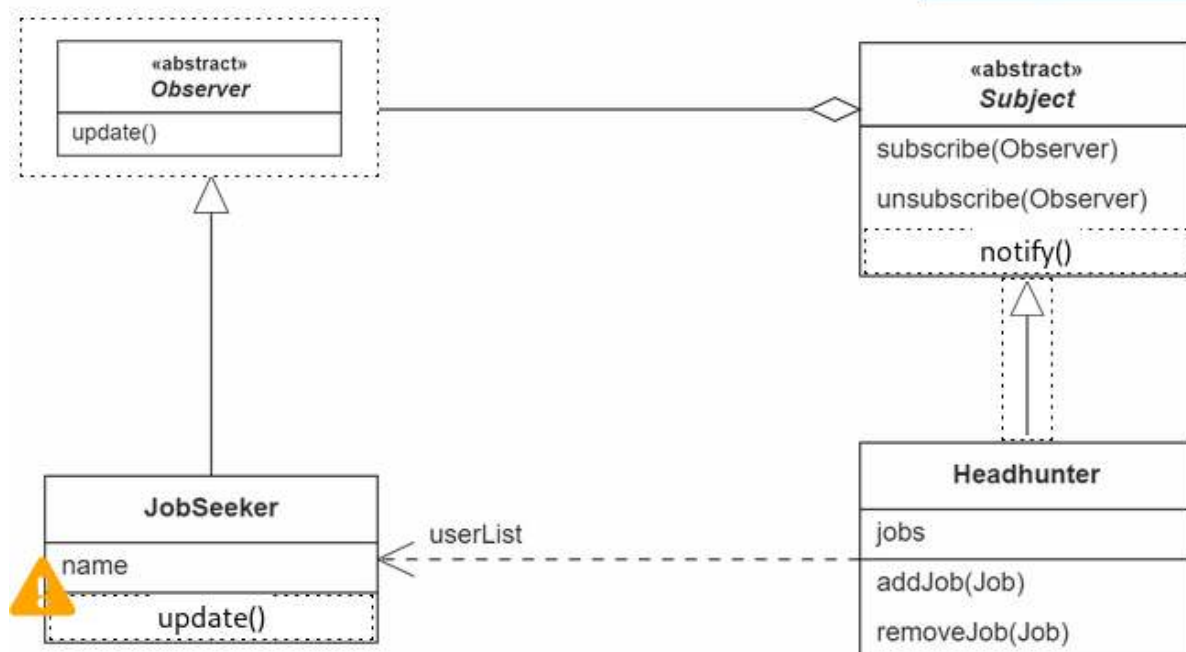
UML Object Design Pattern

You are creating a job offer application together with a friend. On this application, headhunters can list different jobs they offer and job seekers can subscribe to the headhunters. Whenever a headhunter adds or removes a job offer the job seekers should be notified. Your friend has modeled this problem statement with a UML class diagram using a design pattern but some parts of the diagram have been lost. It is your job now to recreate the UML class diagram.

Fill the empty spaces in the UML class diagram by dragging and dropping the elements below the diagram into the correct places. Please note that not every element is needed!

Sample Solution:

[Hide Sample Solution](#)



Differentiating between test doubles

You have to create a short program for your group of classmates, which should calculate their attendance in percentage during the whole semester. This should be directly reflected in the LRZ-database, where all the data should be stored. However, you are at the stage of your project where you just want to test the functionality of your system, but you don't want to instantiate a connection to the LRZ-database since it's too expensive. Thus, you have a copy of the database on the RAM of your local computer. In this case, your implementation is considered as:

Please choose all correct answer options

Answer		Solution	You
Stub	 Explanation	Wrong	<input type="checkbox"/>
Dummy	 Explanation	Wrong	<input type="checkbox"/>
Fake	 Explanation	Correct	<input checked="" type="checkbox"/>
Mock	 Explanation	Wrong	<input type="checkbox"/>

How to deal with faults

There are different ways of dealing with faults.

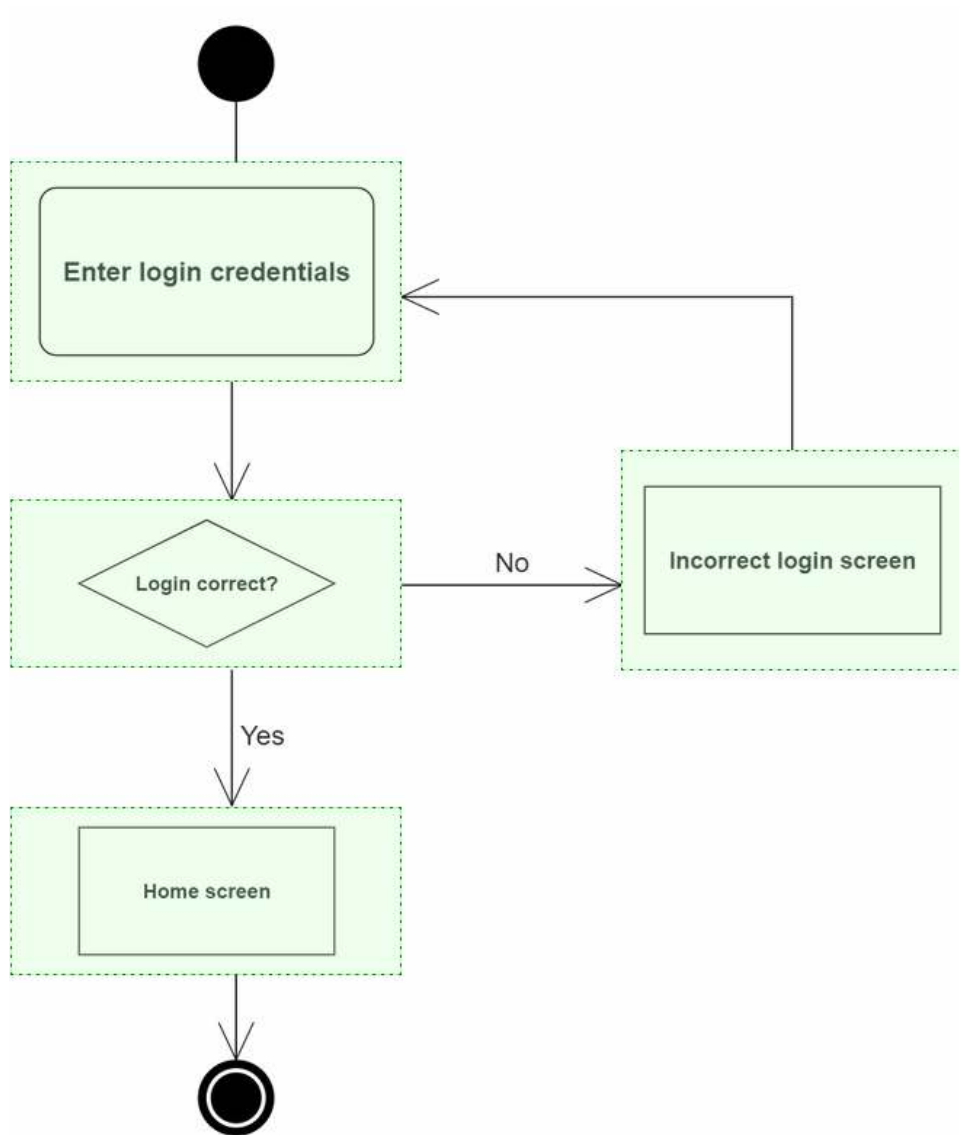
One is making use of exception handling: even if the system shows deficiencies, that is admissible and it can still be operated with. This is called *fault tolerance*.

Continuously reviewing the system during its creation is called *fault avoidance*.

Actively seeking faults and trying to induce them in an organized way is called *Fault detection*.

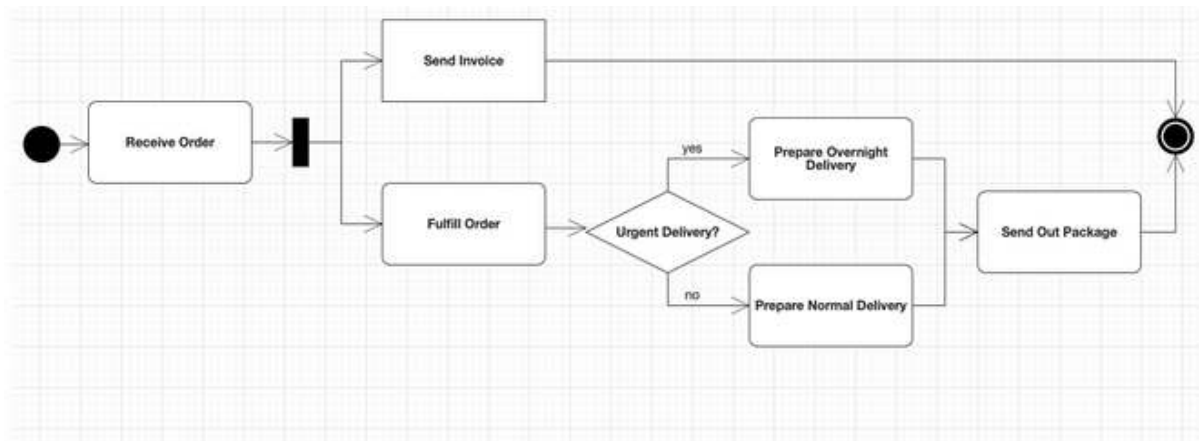
Activity Diagram

You have designed the login page for an Investment Club. Because it is easier to showcase how the process works to the client, you decide to create an activity diagram. Drag and drop the items on the correct spots to finish the diagram.



Activity Diagram

You decided to found a T-Shirt company together with your friend. Customers are able to select their desired T-Shirt and get it delivered to their home. During check-out, they have the option of choosing between the delivery options overnight delivery and normal delivery. To get a better overview of how the implemented order system works, your friend decided to create an activity diagram. Unfortunately, you realize that there are some mistakes in his diagram. Help your friend and identify all mistakes in the diagram.



Please choose all correct answer options

Answer		Solution	You
The join node before the end node is missing.	❗ Explanation	Correct	<input checked="" type="checkbox"/>
"Receive Order" should be an object node.	❗ Explanation	Wrong	<input type="checkbox"/>
"Send Invoice" should be an action node.	❗ Explanation	Correct	<input checked="" type="checkbox"/>
The start node is connected wrong.	❗ Explanation	Wrong	<input type="checkbox"/>

Version Control Management

You are working in a software development team with inexperienced developers. Your company is using Git as a version control system and you just uploaded your changes to the remote repository. Your colleague Peter wants to download your changes into his local repository. Which command(s) could he use?

git pull	! Explanation	Correct	<input checked="" type="checkbox"/>
git push	! Explanation	Wrong	<input type="checkbox"/>
git show	! Explanation	Wrong	<input type="checkbox"/>
git fetch & git merge	! Explanation	Correct	<input checked="" type="checkbox"/>

Choice of a Version Control System

You are working on a low-budget project at a software start-up. Since there is little to no funding, the company can't afford adequate maintenance and the servers frequently crash. As a result, the code that has just been created gets lost. This situation becomes quite frustrating, so the team gathers and decides to use a new version control system. This VCS should be able to prevent this reoccurring turn of events. For what kind of a VCS should the team look and why?

distributed VCS, centralized VCS

A distributed VCS, since the repository can be restored from a programmer's computer if the server crashes	! Explanation	Correct	<input checked="" type="checkbox"/>
There is no need for a version control system. The programmers can use their local working copies.	! Explanation	Wrong	<input type="checkbox"/>
A centralized VCS, since it has more administrative control and will prevent outages in the future	! Explanation	Wrong	<input type="checkbox"/>

Problems using Git

Your friend started working in a software start-up company that uses git as a version control system. He tried to push his changes to the remote repository but he received an error message. When looking at the file he tried to push, he can see the following insertion:

```
<<<<<<< HEAD
System.out.println("Hello");
=====
System.out.println("Bye");
>>>>>>> n10d39749eac26d53652df5c190927479c2bc34ec
```

Since you are an experienced developer he asked you for help with this error. Which of the following statements is correct?

Please choose all correct answer options

Answer		Solution	You
The insertion indicates that there is a merge conflict. To resolve this he should merge the commits and then push the updated version	! Explanation	Correct	<input checked="" type="checkbox"/>
There is no need to do anything because this error does not have an impact on your friend	! Explanation	Wrong	<input type="checkbox"/>
The insertion indicates an error on the remote repository. To resolve this the remote repository should be reset from a local copy	! Explanation	Wrong	<input type="checkbox"/>

Bad Code

```
public class Transaction {

    public void sendMoney(BankAccount bankaccount1, BankAccount
bankaccount2, int amount) {

        if (bankaccount1.getMoney() > amount) {
            if (bankaccount1 != bankaccount2) {
                if (bankaccount1.getMoney() > 0) {
                    if (bankaccount2 != null) {
                        if (bankaccount1 != null) {
                            bankaccount1.sendMoney(amount);
                            bankaccount2.receiveMoney(amount);
                            System.out.println("The transaction was
successful");
                        } else {
                            System.out.println("An error occured");
                        }
                    } else {
                        System.out.println("An error occured");
                    }
                } else {
                    System.out.println("An error occured");
                }
            } else {
                System.out.println("An error occured");
            }
        } else {
            System.out.println("An error occured");
        }
    }
}
```

The cyclomatic complexity is too high

❗ Explanation Correct

Missing null checks in the beginning of the method

❗ Explanation Correct

No meaningful error messages

❗ Explanation Correct

Missing semicolon

❗ Explanation Wrong

Types of Reviews

Given the following review process, determine which type of review is described.

You take part in a meeting, where code and models are first presented to you and your colleagues. During and after the presentation, you and your colleagues inspect the artifacts and try to find errors. When you find an unhandled exception in the code, you mention it in the meeting. Anna writes down your and your colleagues' critique to pass on to the developers.

Inspection

Inspection	❗ Explanation	Correct
Walkthrough	❗ Explanation	Wrong
Peer Review	❗ Explanation	Wrong
Informal	❗ Explanation	Wrong

Bad Model

Which aspects of the following communication diagram are wrong?



Please choose all correct answer options

Answer	Solution	You
One method is missing in ChatApp	❗ Explanation Correct	<input checked="" type="checkbox"/>
alex: Student should be Student: alex instead	❗ Explanation Wrong	<input type="checkbox"/>
The ChatApp cannot be initialized without a name	❗ Explanation Wrong	<input checked="" type="checkbox"/>