

Einführung in die Softwaretechnik

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



Artemis 5.1.3

Your submission to Graded Online Exercise (Weijie Shi)

Date: Jul 21, 2021 **Time:** 08:00 - 09:40 **Duration:** 1h 40min 0s

Export PDF

Begin of Student Review: Aug 5, 2021 13:00

End of Student Review: Aug 9, 2021 03:00

Examiner: Prof. Dr.-Ing. Bhatotia Pramod Module number: IN0006 Course: Introduction to

Software Engineering / Einführung in die Softwaretechnik

Exercises: 10 Points: 100

Overview

#	Exercise	Included in Score	Your points	Points
1	Quiz	Yes	0	4
2	Quiz	Yes	0	3
3	System Design Model Review 2	Yes	0	9
4	Quiz	Yes	0	4
5	Use Cases 3	Yes	0	8
6	Continuous Software Engineering 1	Yes	0	8
7	Testing	Yes	0	20
8	Quiz	Yes	0	5
9	Object Design	Yes	0	30
10	Analysis Object Model 4	Yes	0	9

You achieved 0 out of 100 possible points

Grade: 5.0

View Grading Key



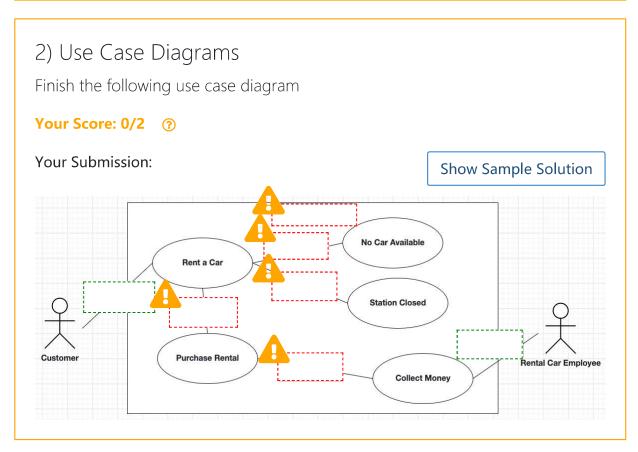
Score 0%, 0 of 4 points (2 months ago)



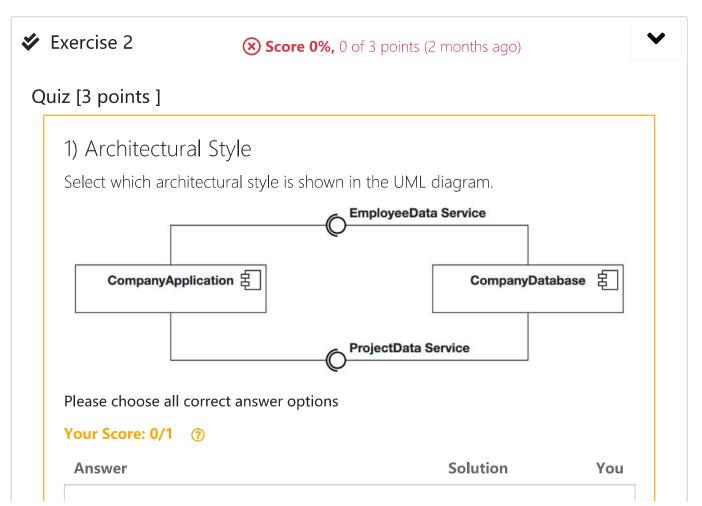
Quiz [4 points]

1) Scrum Which statements about Scrum are correct? Please choose all correct answer options Your Score: 0/1 ② Solution **Answer** You The development team includes members from Correct different disciplines. The potentially shippable product increment Correct only contains fully realized backlog items. The product owner should have application Correct domain knowledge. The product owner should make sure that the Wrong development team follows the Scrum process. Developers are responsible for the prioritization Wrong of backlog items.

Exam

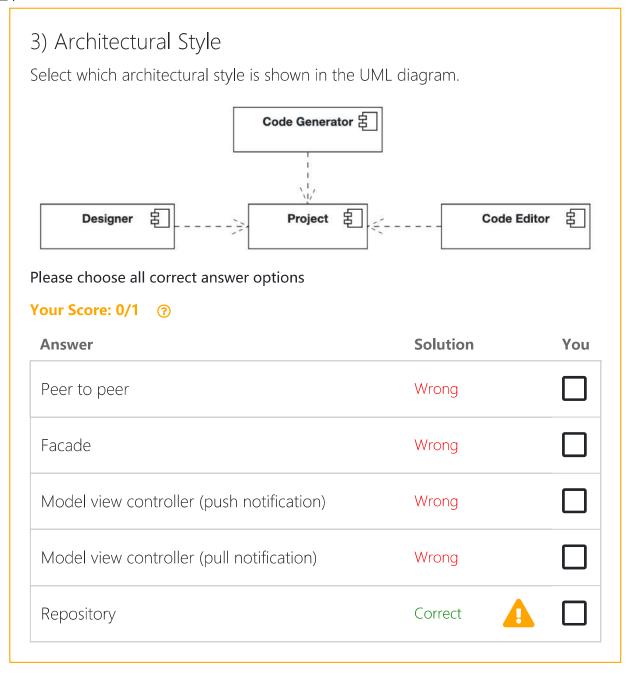


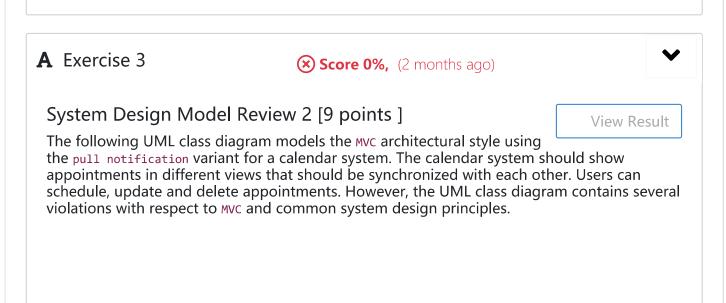
3) Team vs. Group Which of the following statements are correct? Please choose all correct answer options Your Score: 0/1 ② Solution **Answer** You Participants in a team are tightly coupled. Correct In a group, the participants tend to be loosely Correct coupled. Team members work individually. Wrong Group members work collectivly. Wrong Every group is also a team. Wrong

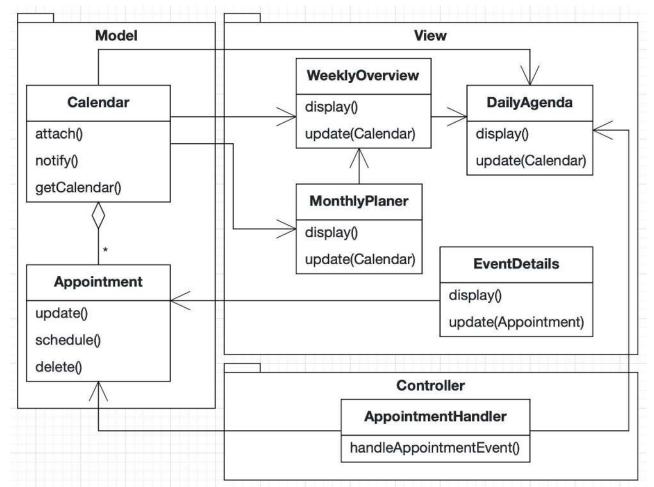


Client server	Correct	
Peer to peer	Wrong	
Model view controller	Wrong	
Facade	Wrong	
Layer	Wrong	

	Message Notification Servi	ce
Messaging Server 呂	Messaging Applica	ation 包
C C	Messaging Service	
Please choose all correct answer options		
Your Scarce 0/1		
our Score: 0/1 ③ Answer	Solution	You
	Solution Wrong	You
Answer		You
Answer Client server	Wrong	You
Answer Client server Peer to peer	Wrong	You







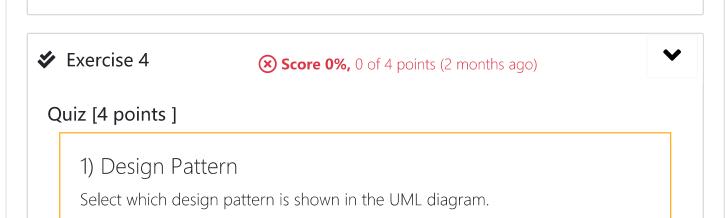
Your tasks

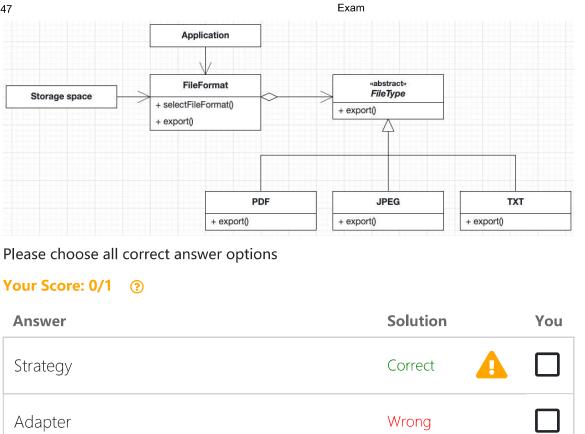
- Identify at least 3 violations in the UML class diagram above.
- Explain each violation in detail.
- For each violation, propose a refactoring to improve the system design!

Hints

- Make sure that your answer clearly references specific model elements.
- Important: Use your own words!

No submission





Wrong

Wrong

Wrong

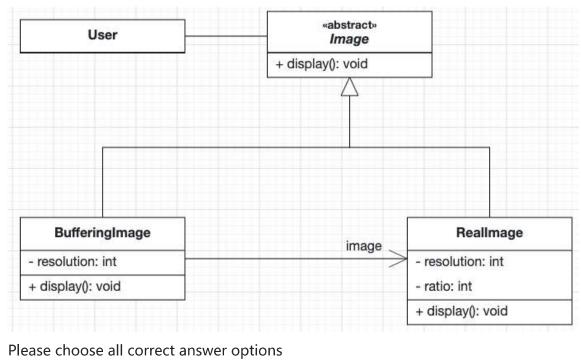
2) Design Pattern

Observer

Bridge

Composite

Select which design pattern is shown in the UML diagram.

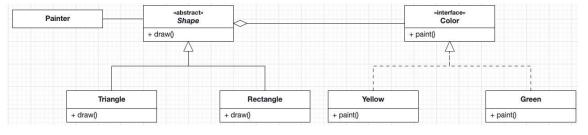


Your Score: 0/1 ②

Answer	Solution	You
Proxy	Correct	
Adapter	Wrong	
Observer	Wrong	
Bridge	Wrong	
Composite	Wrong	

3) Design Pattern

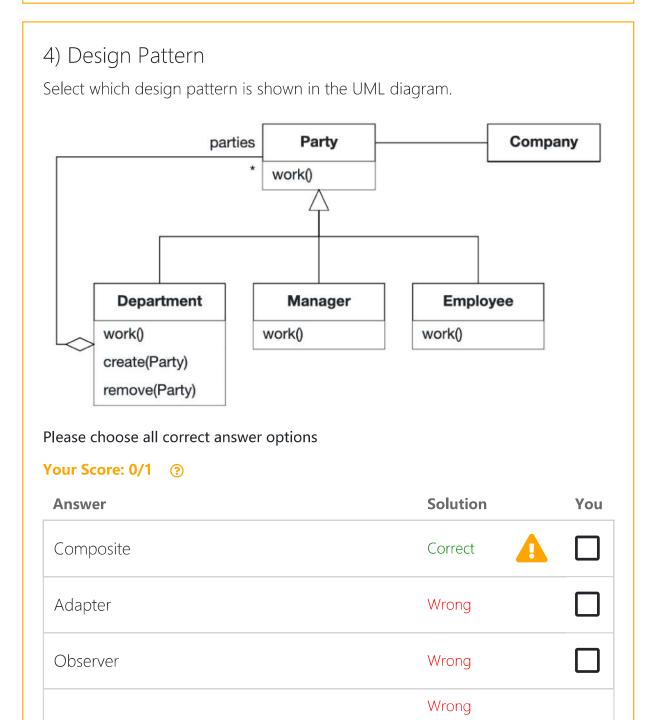
Select which design pattern is shown in the UML diagram.



Please choose all correct answer options

Your Score: 0/1

Answer	Solution	You
Bridge	Correct	
Adapter	Wrong	
Observer	Wrong	
Proxy	Wrong	
Composite	Wrong	



A Exercise 5

Score 0%, (2 months ago)



View Result

Use Cases 3 [8 points]

The corona pandemic changed our everyday life. To help the local restaurants to recover, the government decided to implement a Corona tracking app. You are part of the development team and have to identify use cases.

To visit a beer garden, customers need to have a negative corona test. Therefore, customers have to be vaccinated. Before the vaccination, the customers have to schedule an appointment. Customers can make an appointment after being unlocked. For scheduling the appointments, the vaccination centers have a web application. After opening the application, the customer enters his preferred day. The application will display the available timeslots. The customer chooses the best fitting timeslot and enters his personal data. Afterward, the customers will receive an e-mail with their confirmed appointment.

The administrators placed a few check-in stations at the entrance of the vaccination center. Customers have to enter their personal appointment data. The system confirms the presence and prints a number for the customer. Afterward, the customer takes a seat and waits until his number is displayed on a screen. The system displays the number, and the customer heads towards the vaccination.

Your task

Based on the problem statement, create 2 use cases for the appointment process and the vaccination process.

Hints

- Define the name, actor, flow of events, entry and exit conditions for each use case.
- Include at least two system and actor steps within each use case.
- Use the following template for the use cases:

```
1) Name: <name>
2) Participating actors: <actors>
3) Flow of events:
   * User step 1: <step>
```

* System step 1: <step>

* . . .

4) Entry conditions: <entry>

5) Exit conditions: <exit>

No submission



Score 0%, (2 months ago)



Continuous Software Engineering 1 [8 points]

View Result

Bob works at a car parts supplier company that develops special software in the area of engine management. As a certified automotive technician, Bob is currently involved in the hardware-software co-development of a new Engine Control Unit (ECU). First, Bob disconnects the negative side of the battery and manually installs the new version of the ECU software in the car. After making sure that the battery is charged over 12v, he reconnects the negative side of the battery and proceeds with the manual integration testing steps: he starts the car. He verifies that all engine functions are working correctly in the new version. Bob finishes the testing of the new version successfully. Finally, he manually deploys it and notifies the customer BMW, i.e., the OEM (Original Equipment Manufacturer).

Your task

Model the dynamic behavior of the described release management process using a UML communication diagram.

Hints

- The explanation for the model is not needed.
- Do not model the systems for version control, continuous integration, continuous delivery/deployment, issue tracking, and development (IDE) as objects.

No submission



Score 0%, <u>0 of 17 passed</u> (a month ago)

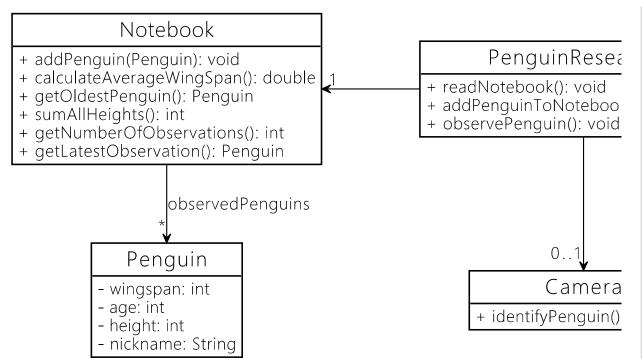


Testing [20 points]

Unit Testing and Mock Object Pattern

Imagine you are on an expedition in Antarctica and observing the behavior of penguins. You want to document all sighted penguins, including their attributes (e.g., age, wingspan, height), to your Notebook so that you can calculate the average wingspan or identify the oldest penguin.

You want to use an innovative camera that automatically identifies attributes of penguins based on machine learning. However, the camera is not yet implemented. The following UML diagram shows the current implementation of the system.



Your tasks

- 1. Test the average wingspan calculation in NotebookTest
 - Implement testcalculateAverage() that tests the correct calculation of the average wingspan for 4 penguins with distinct wingspans.
 - Implement testCalculateAverageEmptyList() that tests that the calculation fails with an IllegalStateException if the list of penguins is empty.

2. Test the observation of a penguin in PenguinResearcherTest

Implement one test that tests the method observePenguin() of PenguinResearcher.

This method relies on the camera, which is not yet available. Use the Mock Object Pattern with EasyMock to mock the Camera.

Test that after the observation of a 5 years old penguin:

- The notebook contains the correct number of observations.
- The latest observation is the same penguin as the one the camera identified.
- The correct nickname got set for the penguin as specified in observePenguin().

Hints

- Do not change anything in the pom.xml or the src folder!
- The Online Editor is not activated. Please use your local IDE.

Repository Link:

https://bitbucket.ase.in.tum.de/scm/EIST21TESTINGPANIMALS/eist21testingpanimals-ga92jom.git

Last Commit Hash: b786ad2



Score 0%, 0 of 5 points (2 months ago)



Quiz [5 points]

1) Quality Requirements		
TUM Stream is a streaming platform for students.		
For each requirement below, decide whether it is a grequirement.	good example of	a quality
Please choose all correct answer options		
Your Score: 0/2 ②		
Answer	Solution	You
TUM Stream should have a high quality. • Explanation	Wrong	
TUM Stream should be coded in Java.	Wrong	
Students should be able to watch lecture recordings with a latency of at most 1s.	Correct	
Students can watch a lecture recording with a maximum of 3 clicks after they have logged in.	Correct	
TUM Stream should be available 99% of the time.	Correct	
2) Functional Requirements		
Consider the development of a university system such following are functional requirements?	ch as Moodle. Wh	nich of the
Please choose all correct answer options		
Your Score: 0/2 ②		
Answer	Solution	You
An unaurothized user should not be able to get information from the system.	Wrong	
A student should be able to load Moodle	Wrong	

quizzes in less than 1s.			
A student should be able to download course material.	Correct	A	
A student can upload homework solutions.	Correct	A	
An instructor can grade homeworks.	Correct	A	

3) Communication

You run into the client on the way to the coffee shop and ask him to clarify one of the requirements again. What type of communication is described?

Please choose all correct answer options

Your Score: 0/1 ②

Answer	Solution	You
Unplanned, synchronous, informal	Correct	
Unplanned, asynchronous, informal	Wrong	
Unplanned, asynchronous, formal	Wrong	
Planned, asynchronous, informal	Wrong	
Planned, synchronous, formal	Wrong	
Planned, asynchronous, informal	Wrong	

Exercise 9

Score 0%, <u>0 of 18 passed</u> (a month ago)

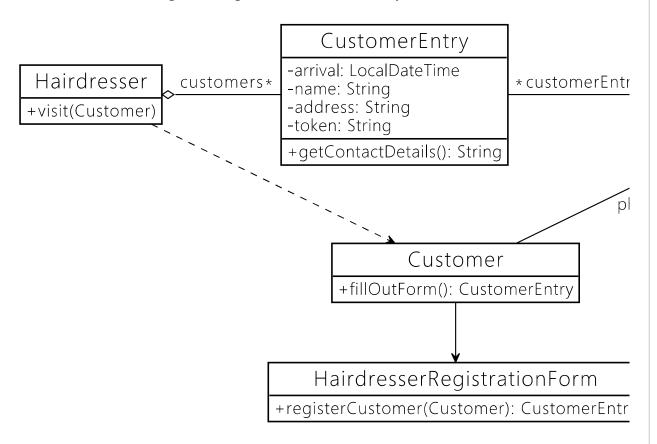


Object Design [30 points]

The receptionist of a local hairdresser approaches you with an urgent request. Due to the

Corona pandemic, she is obliged to register every customer who wants to visit the hairdresser. The customers can register themselves at the hairdresser shop by filling out the hairdresser registration form. However, this registration variant is criticized as not environmentally friendly and not compliant with data privacy rules. Therefore, more and more customers want to use the new and innovative CancelCoronaApp to register at the hairdresser shop.

To not lose potential customers, the receptionist of the hairdresser wants to offer this registration option as well. With the new system, a customer registers either via the CancelCoronaApp or by filling out the hairdresser registration form. Regardless of the registration strategy, the customer information is added to the list of customer entries of the hairdresser. The following UML diagram shows the current system:



As the pandemic progresses, the system may require additional registration strategies. With this knowledge in mind, you decide to apply the **Strategy Pattern**.

Your Task

Implement the new registration based on the CancelCoronaApp and refactor the current system accordingly so that it follows the structure of the strategy pattern. Make sure to follow coding best practices.

1. Introduce an interface

Each strategy offers the method registerCustomer(Customer). Once the customer completes the registration, the information is returned as a CustomerEntry. Abstract the method specification to the RegistrationClient interface.

2. Implement the new strategy

The registration through the CancelCoronaApp makes use of token generation, hiding the actual contact data of a Customer. For each registration, a new token is generated, which is used to create a CustomerEntry that is saved on the Phone. This procedure ensures that the

receiver of the token can contact the provider of the CancelCoronaApp to issue warnings to affected users.

3. Implement a policy

Add a HairdresserPolicy that is responsible for selecting the most suitable strategy. Registering via the CancelCoronaApp, which is the preferred registration method, requires the phone to have the app installed. In other cases, HairdresserRegistrationForm is used.

4. Manage customers in Hairdresser

The method visit(Customer) makes sure that the correct strategy is used. The information of a customer who visits the hairdresser is added to the customers to react in case of an infection. Make sure to refactor the context where needed.

Repository Link:

https://bitbucket.ase.in.tum.de/scm/EIST21OBJECTHDESIGN/eist21objecthdesign-ga92jom.git

Last Commit Hash: 1a8dec1







Analysis Object Model 4 [9 points]

View Result

Oliver wants to attend the European Football Championship. He checks the available seats for the final match in London. He books a ticket in the VIP area of the Wembley stadium and receives a confirmation ticket containing the ticket ID, seat number, booking date and time. He checks the travel regulations based on COVID and realizes that in order to successfully enter the stadium, he must present a negative COVID test certificate, which must be validated at the stadium entry control. For this purpose, the PCR test procedure must not have been performed earlier than 24 hours and the test certificate must contain the personal identification number, name, age, date of birth of the tested person, the procedure used, and its result. He must also wear an FFP2 mask during the match at the stadium.

Your task

Create an analysis object model (UML class diagram) to model this problem statement.

Hints

- Make sure to include the relevant classes, attributes, methods and associations in your model.
- The explanation for the model is not needed.

No submission

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