Software Systems Design - Diagnostic - 2022-12-01

Course: B-CS-MOD01-1A-202001022 B-CS Pearls of Computer Science Core 202001022

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Welcome to the Software Systems Design digital diagnostic test:

- ***This is an open book exam -- You are allowed to use the slides which are digitally available on your Chromebooks under the URL: https://grammarware.net/slides/2022/ss/ (a separate tab should already be open).***
- ***Smartphones or personal notebooks are not allowed. Put those in your bag now (with the sound switched off).***
- ***For technical questions concerning the chromebooks, Remindo, log-in issues etc.: raise your mouse***
- ***For content questions: use the BBB chat.***
- ***Do not forget to save your answers once you are done.***
- ***Take your time to familiarize yourself with the Remindo environment.***
- ***The real exam is longer and will have more questions.***
- ***This is a diagnostic test. It is not graded! (Even though Remindo says so).***

Good luck and enjoy the test!

Number of questions: 7

1 4 pt.

The classical phases of software development consist of 1. requirements, 2. design, 3. construction, 4. testing, 5. deployment and 6. maintenance phase.

Describe the key differences between the construction phase and the maintenance phase.

2

The core components of object-oriented design, according to how it was discussed during the course, are

1. hierarchy,
2. abstraction,
3. modularisation, and
4. encapsulation.

Explain in your own words what each is, and why it is important.

1 pt. **a.** Hierarchy:

1 pt. **b.** Abstraction:

1 pt. **c.** Modularisation:

1 pt. **d.** Encapsulation:

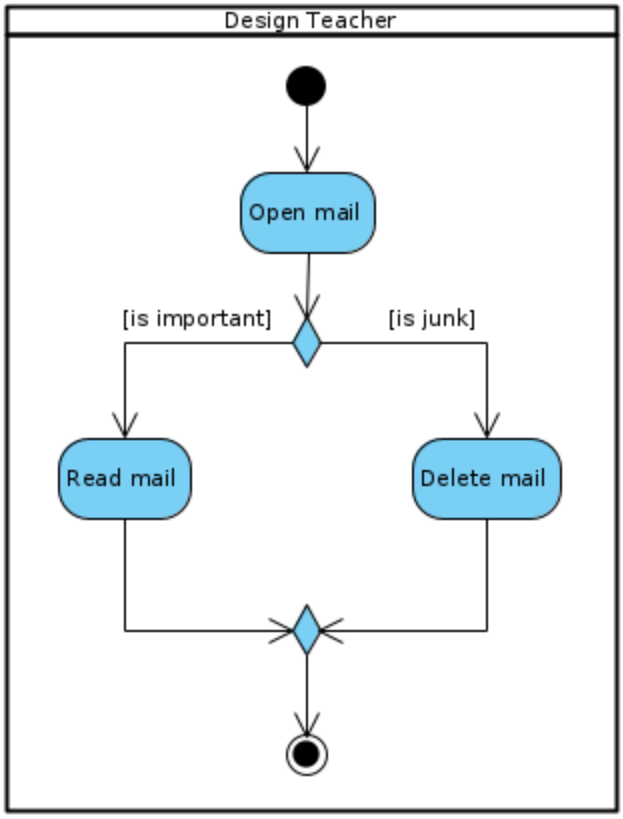
3

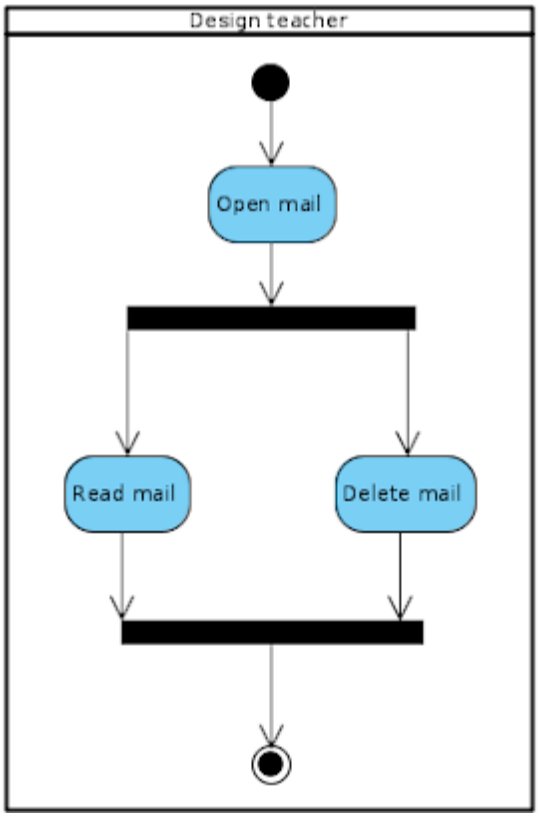
"During requirements elicitation it is your job to find out what the customer *really* wants" is a commonly repeated statement in software development.

4 pt. **a.** Explain what is meant by it, and describe how requirements elicitation can help to circumvent potential problems.

2 pt. **b.** Name two elicitation techniques and explain their relevance in the phase.

4 Given are the following two activity diagrams AD1 (left) and AD2 (right):





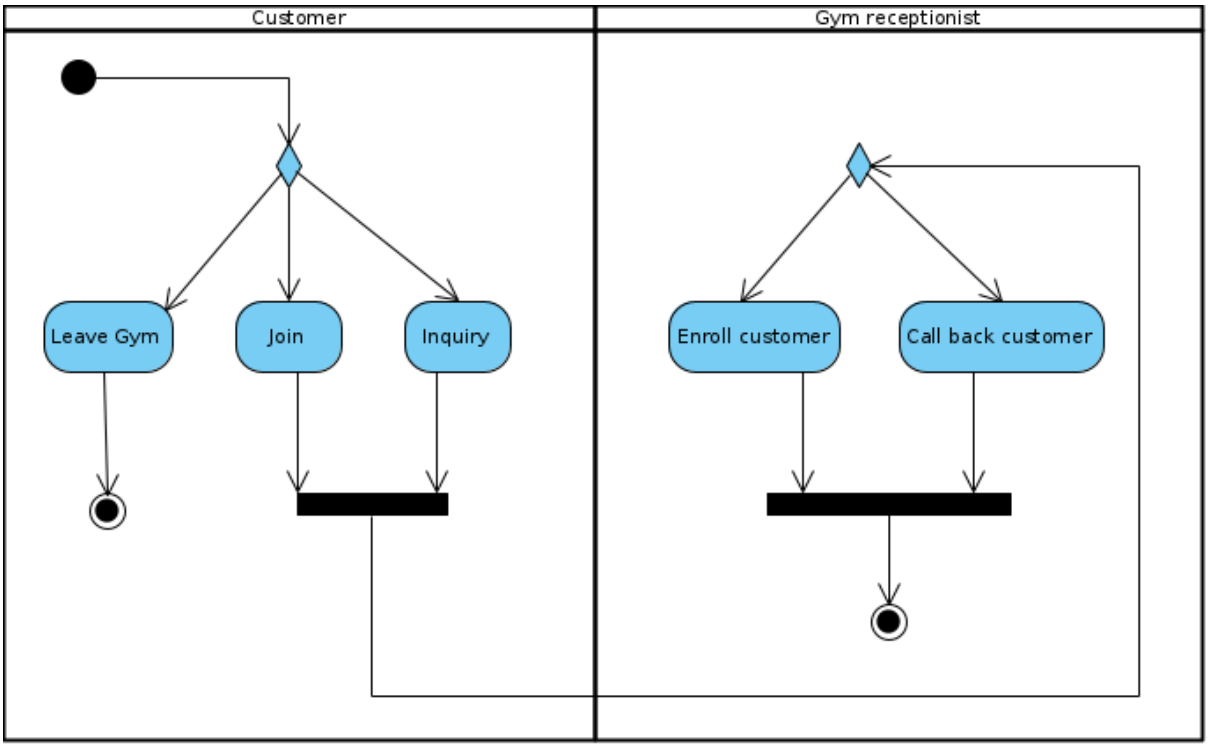
4 pt. **a.** Explain the difference between the two diagrams. Do both of them model the same behaviour?

2 pt. **b.** Which of the two activity diagrams models the behaviour of your Design teacher best.

Provide a short explanation of why you think that way.

5 Given is the following activity diagram modeling the enrollment of a customer in a gym:

6 pt.



Explain what is wrong with the presented diagram by pointing out **three issues** that can be improved.

Shortly describe how you would change them.

6 8 pt.

Given below are pairs of classes (eg. "House" and "Room").

For each pair:

1. **draw** a sensible association between the classes (use the drawing tools beneath the image),
2. specify meaningful association names when appropriate (eg. "lives in" or "owns"),
3. specify the multiplicity/cardinality of the association if appropriate (eg. "1 - 1" or "1..* - 0.. 5").

Do not draw associations that cross the black lines.

Hint: Your drawing must not be perfect as long as its intention is clear.

7 2 pt. You want to develop a software system for source code management as a direct competitor to *git*.

Name exactly four requirements you would use to ensure your success.

Thank you, your answers were saved.

Note that we will not correct your answers to this diagnostic test. You can find its on Canvas.