

EXAM

Software Engineering

Examiner: Rico Möckel
Date: ???

Exam Notes:

1. The exam is a closed book exam.
2. The exam consists of 3 pages (including this page).
3. The exam time is 3 hours (180 minutes).
4. The number of exam questions is 8.
5. Each question is accompanied by an indication of the length (or maximum length) of the expected answer. These are indicative numbers; going over this limit will not cause you to lose points.
6. The maximum number of points you can gain accompanies each question. In total, ??? points can be earned.
7. Before answering the questions, please first read all the exam questions, and then make a plan how to spend the three available hours.
8. Please don't forget:
 - to write your name and student number on each page
 - to number the pages
 - to number the answers
9. While you shouldn't spend too much time on calligraphy, make sure I will have at least a chance deciphering your exam.
10. When ready to hand in, make sure your name is on every page, fold the exam questions and put your (unfolded) answers inside the (folded) questions.

Question 1 (8 pts):

Based on your experience with it, write 3 user and 5 system requirements for an ATM machine, cash machine or cash point, i.e. the machine in a wall where you can withdraw money from your bank account. Be sure to include at least two non-functional requirements. Mark the connection between user and system requirements and make each requirement verifiable. (1/2 page)

Question 2 (7 pts):

Discuss the “layered architecture”. What is it? What is its structure? When would you use it? How does it work? (1/2 page)

Question 3 (5 pts):

Explain the Proxy pattern. What is it used for? What are the advantages and disadvantages when using this pattern? (1/2 page)

Question 4 (35 pts):

Sport teams are becoming more and more careful with their often very expensive players. They want to keep a close eye on every player's physical shape and how they are maintaining it. This means being able to (1) track their exercise program, logging different work-outs and the exercises performed during these work-outs, (2) track their nutrition, i.e. what they eat/drink and when, (3) their performance during matches, i.e. how much distance did they cover, how accurate/fast/strategic were they, ... and (4) their medical status, i.e. injuries, etc. The team manager will enter training and match performance into the system, the team's doctor will enter their medical history and players are themselves responsible for entering their nutritional intake. The management of the team wants to be able to check the evolution of players in the system. Make a design for such an athlete tracking system. Don't forget to accompany your design diagram(s) with some natural language explanations. (<2 pages, including your design diagram(s))

Question 5 (7 pts):

GRASP presents a number of principles to help assign responsibilities to classes/objects during OO design. What does the High Cohesion principle help you with and what does it say? Illustrate with an example. (1/2 page)

Question 6 (15 pts):

What is “Scrum”? Include a discussion of its structure, the followed principles and advantages and disadvantages. (1 page)