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Software Design, Modeling, and Analysis in UML

<http://swt.informatik.uni-freiburg.de/teaching/WS2016-17/sdmauml>

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Exercise Sheet 7.B

Early submission: Thursday, 2017-02-02, 18:00

Regular submission: Thursday, 2017-02-02, 18:00

**Exercise 1**

**(10/20 Points)**

Recall Exercise Sheet 6.B which asked for a Rhapsody model of a web shop software, and in particular for a state machine model of the behaviour of the Session objects. Please mail your tutor<sup>1</sup> for the assignment of one of the submissions of your colleagues (made anonymous, of course).

Assess the (functional and non-functional) quality of the model you're assigned. Focus on the new class diagram(s) and the Session's state machine.

*Hint:*

(i) Describe briefly (in your own words) what you've obtained and discuss at least:

- Which artefacts are provided by the authors with which intentions?
- Is it adequate for you (i.e., for an expert in web shop design issues) to understand the model with an appropriate effort (considering, e.g., the layout of the diagrams and the accompanying design descriptions)?
- What is good about the presentation? What is unclear?
- Does the model build and run within Rhapsody?
- In how far are you convinced that the submission is a good solution of the task? (Where 'good' first of all means: satisfies the requirements.)
- Assess the design ideas; are modelling features used appropriately in your opinion?

(ii) Pick at least one requirement from Exercise Sheet 6.B (why did you pick this one?) and assess the model you've obtained in more detail for whether the requirement is satisfied or not.

If you think that it holds, than provide as many additional test cases as needed to make plausible to the tutor why you do think that. Otherwise, provide a counterexample as a recorded sequence diagram.

(iii) What do you like about the overall solution (colour, shape, presentation, design ideas, . . . , everything)? Why? What do you not like? Why?

(An example for a "why" could be: because it violates a modeling guideline which you can name and because the violation has an explainable negative effect which the modeling guideline should avoid in first place.)

If the model is not executable, please try to fix it given the experience from your own model. In case of unclear aspects, act in "good-will" mode. If you really get stuck, ask your tutor for help (he will pass questions on to the original authors). If you like, you may also sketch the consequences that a "bad-will" review would have.

**Exercise 2**

**(5 Bonus)**

Design models can be used to evaluate design decisions. In this task, we want to investigate a part of the design space regarding the treatment of items in the shopping phase.

Putting it very simple,

- a customer is happy if he or she can buy an item whenever the item is available in stock.
- a merchant is happy if he or she can sell an item whenever a customer has the intention to buy this item, that is, not items are uselessly left in stock.<sup>2</sup>

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<sup>1</sup>Mail to `schaetzc` with the usual `informatik.uni-freiburg.de` suffix.

<sup>2</sup>For example, there are items which have a notion of "season" or "fashion", such that those items, when not sold in a particular time frame, only achieve disadvantageous prices afterwards. A merchant may get extra-unhappy if items of this kind remain unsold *although* there had been customers who were willing to buy the item, but didn't succeed to do so.

- (i) There is the claim that the design of the given web shop does not always make customers *and* merchants equally happy (assuming customers have only a limited amount of attention to spend, i.e. a customer will not re-try if the desired item cannot be bought immediately). (2)

Support this claim using a recorded sequence diagram, e.g. focusing on the apparently rare item “ZCY539” of which only three are in stock initially.

- (ii) Can the “happyness” of one party be increased in the example from the previous task by changing the design?

Propose a changed design and discuss whether the increased happyness of the one party may come at the price of decreased happyness of the other party in other scenarios. (2)

- (iii) There are web shops, which achieve very high customer *and* merchant happyness (in the sense of the above definition), even with a web shop design very similar to ours.

Any idea how they achieve that? (1)

*Hint: the web shop experience of customers (and merchants) does not only depend on the software design. You may think of other aspects which influence the real web shop experience of a real web shop in “the real world”.*