Rheinische Friedrich-Wilhelms-Universität Bonn
Institut für Informatik III
Prof. Dr. A. B. Cremers

Advanced Topics in Software Construction (ATSC)
Winter Semester 2011
D. Speicher, J. Nonnen

Assignment Sheet 3

Due: Tuesday, November 08, 2011, 23:59

For help, contact atsc-lecture@lists.iai.uni-bonn.de (staff and participants).

Start working on the exercises early enough so that you can contact the staff in time in case of problems. Don't expect them to be available during the weekend!

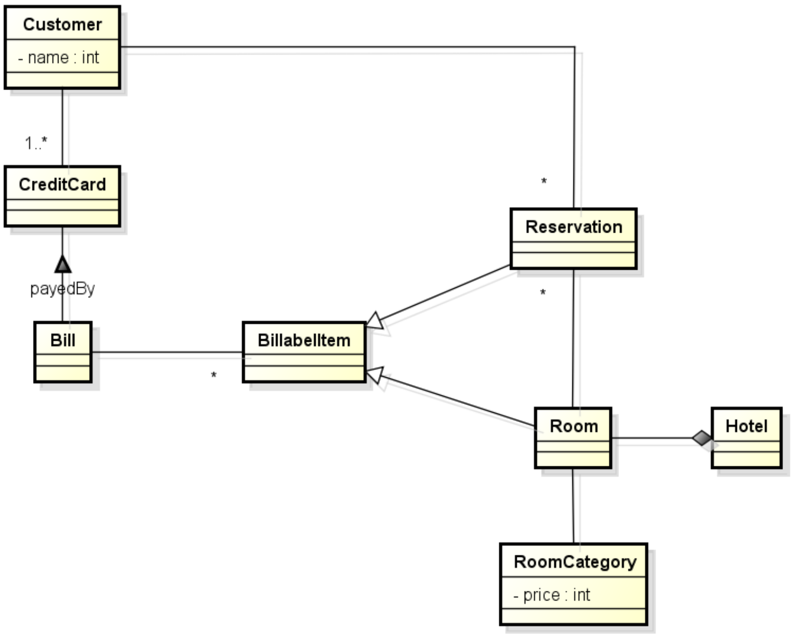
Submit your solution into your group's SVN under the folder "assignment03". The solutions (if not otherwise mentioned) should be submitted as **PDF files**. The lattices can be provided as images.

Task 1. *Practice Writing Effective Use Cases – Agile Use Cases* (4 Points)

The task should give you experience, how easy it can be to develop a broad picture of a system if you postpone the implementation details till the time it is required. You can pick any software idea that you want to create. Please use only plain text.

a) Name the actors and the goals they want to achieve with this system. Structure these goals into a hierarchy (sea level till kite level).
[For this exercise: Should be 2 to 5 actors, with 4 to 10 goals in total]
b) Pick two of the user goals at "sea level" (i.e. goals that can be fulfilled with one interaction sequence between actor and the system, corresponds to use cases), and describe the steps by which the actor achieves these goals.
c) List all extension conditions that could occur during these two interactions.
d) Describe for two extension conditions how you could handle them.
e) Write one summary use case that describes how a user can achieve a summary goal with a sequence of user goals.

Task 2. *Modeling in Color* (6 Points)

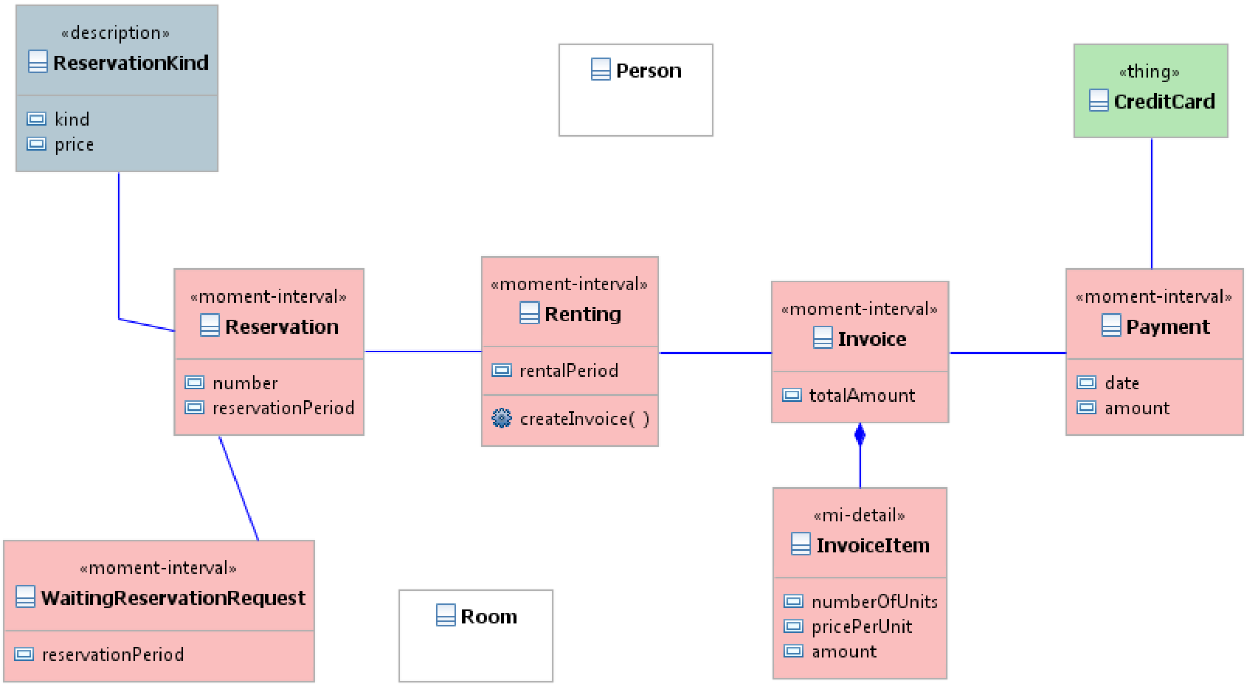


The above class diagram for a hotel domain was created by a co-worker and should be enriched.

a.) Apply the archetypes (`moment-interval`, `mi-detail`, `role`, `party`, `place`, `thing`, `description`) to the classes. Add a note to each class explaining why you have chosen the archetype.

b.) Below you find a new domain model created by your co-worker.

1. He already expressed that `Reservation`, `Renting`, `Invoice`, and `Payment` take place at separate moments or time intervals. Sometimes a request for reservation occurs even before the reservation. Add the appropriate archetypes to the classes `Person` and `Room`. If later on required you may add further classes with appropriate archetype.
2. It should be possible that the person who reserves rooms and receives the invoice is different from the persons who actually stay there. Express this in the model.
3. Till now only the `Invoice` has details, but it makes sense for almost all other classes: Add the missing `mi-detail` classes. Review your model and add missing classes and associations.



Task 3. *Explore Data Granularity Using a Lattice I* (1 Point)

This task uses the tool *Concept Explorer*; it can be downloaded from the project website http://conexp.sourceforge.net/.
Open the provided resource file "Assignment3Task3.cex" in the Concept Explorer. Generate the corresponding lattice and explore it sufficiently enough so that you are able to explain the following questions:

1. What is illustrated in the upper and in the lower part?
2. Why is thing X so high in the diagram? Shouldn't it lie in the scope of use case Y?
3. Why is (sub-) use case X so low in the diagram? Shouldn't its scope comprise thing Y?
4. Is node X a good class candidate? Are its sub-nodes good candidates for (OO-) attribute and its super-nodes for (OO-) operations?

Task 4. *Explore Data Granularity Using a Lattice II* (2 Points)

This task is based on Task 3. The domain expert suggested to add the following use cases (control classes) :

- `CreateDeliveryInstruction`, operating on `Destination, DeliveryInstruction`
- `InsertDetailedOrderedItem`, operating on `DeliveryInstruction`
- `AttachDeliveryInstructions`, operating on `Destination, DeliveryInstruction, DeliveryTruck`

Add these use cases into the lattice and recreate the lattice. Describe what has changed in the lattice

Dictionary Task* (0 Points)

On each assignment sheet you will find a set of terms used in the lecture. Your (optional) task is to write a short description for each term in your own words. Try to make it as short and precise as possible. We do not accept copied sentences.

The best solution of each week will be added to a combined dictionary on our lecture website:
http://sewiki.iai.uni-bonn.de/teaching/lectures/atsc/2011/dictionary
There you can also see which group contributed which description. You can also at any time improve an existing entry.

Creating the dictionary is also an opportunity to check your knowledge on the topics. This also directly gives you feedback on which topics you probably need to improve for the exam.

Terms:

Summary Use Case

Formal Concepts

Extension

Domain Neutral Component