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Summer term 2008

Software Engineering

http://swt.informatik.uni-freiburg.de/node/94
http://proglang.informatik.uni-freiburg.de/teaching/swt/2008/

Exercise Sheet 10

2008-07-18

Exercise 1 (Collections in OCL; 6 Points)
Let *col* be a collection in OCL. Implement the following operations:

(a) `hasNElements`: Returns `true` for some number n und some expression *expr*, if there exist exactly n elements in *col* that fulfill *expr*. The iteration variable in *expr* is `it`.

(b) `isUnique`: Returns `true` if *col* does not contain duplicates. Do *not* use the builtin function of the same name.

(c) `take`: Returns for some number n a subset of *col*. The size of the subset is the minimum of n and the size of *col*.

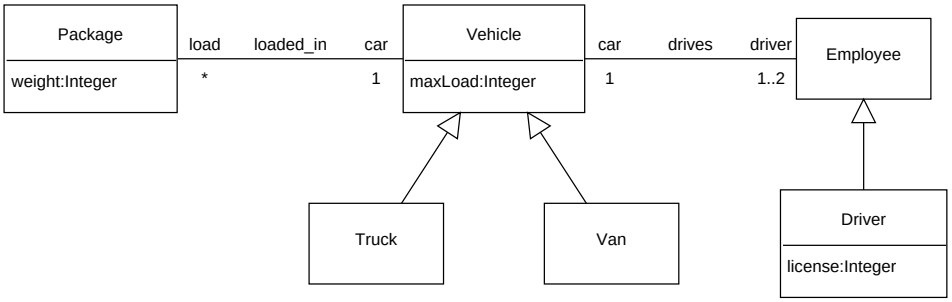
Exercise 2 (Pre- and postconditions in OCL; 4 Points)
(a) In the lecture, you have seen a precondition for the operation `move` of class `Meeting`. Refine this precondition so that meetings in different location can take place at the same time.

(b) The class `Meeting` from the lecture gets now extended by an operation

```
relocate(newLocation :  Location)
```

which changes the location of a meeting. Find sensible pre- and postconditions for `relocate`.

Exercise 3 (OCL in praxis; 8 Points)
The following class diagram models part of a truckage company:



Implement the following constraints in OCL:

(a) Every Employee driving a Vehicle has to be some kind of Driver. (There may be other kinds of Employees not listed in the diagram).

(b) If the Vehicle is a Truck than two Drivers are assigned to it, Vans have only one Driver.

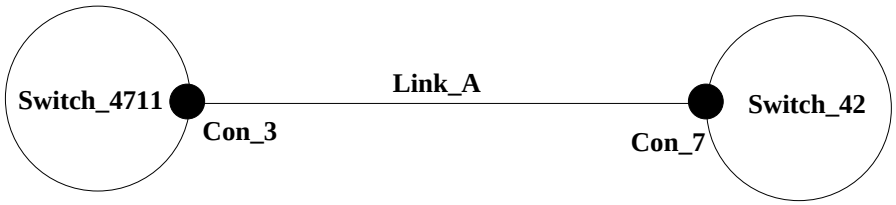
(c) The Drivers of a Truck have to have a Licence value of 2.

(d) The combined weight of all Packages loaded into one Truck may not exceed its maxLoad.

Exercise 4 (Meta Modelling; 6 Points)
Design a DSL for modelling networks. Thereby, a network consists of the following parts:

- A **Switch** has a name (string) und some **Connectors**.
- A **Connector** has a name (string) and is associated to a **Switch**. Moreover, the **Connector** connects to another **Connector** over some **Link**.
- A **Link** has a name (string) and connects two **Connectors**.

Here you see a graphical representation of a sample network:



(a) Design a meta model for modelling networks.

(b) Draw a classifier diagram that shows the connection between the meta model and the sample network from above.

Submission: 2008-07-25, 12pm **before** the exercise session in HS 00-036, building 101.