Harder OCL exercises

Purpose

These exercises are intended to be a little more challenging than the basic ones. Do these if you have time once you are confident with the basic exercises. If you don't do them now, I suggest doing them later for revision. There may well not be time to discuss these in the tutorial, but if you would like feedback on your work, write it up and give it to your tutor for marking. You may do this at any time during the course. Tutors are appointed as markers as well, and should be able to return marked work within a few days under normal circumstances – but of course that won't work if everyone hands in a pile of work a few days before the exam! If any tutor does get overwhelmed, let me know, as a group feedback session might then be more appropriate.

Look at the UML Superstructure document, 11-08-06. You will see that most of it is organised by giving a class diagram (in which the classes are actually metaclasses, i.e. they represent concepts in the domain "modelling software systems", e.g., Association, Property, Class, Generalization etc.), and then, for each (meta)class, giving explanations of its meaning, attributes, associations etc. - and usually, some contraints in OCL. For example, you'll find the constraints for class Association on p53 of the PDF (p37 in the document's own numbering) and to interpret them you'll need to look at the diagram containing (meta)class Association which is Fig.7.12 on p45 of the PDF (p29 in the document's numbering).

Until you are bored/out of time:

1. Pick an OCL constraint from the document, find the diagram that gives its context, and check that you understand exactly what the OCL means and why it means it. Can you understand why this constraint is placed on this metaclass? Does the English version of the constraint capture precisely what the constraint means, or is it ambiguous?

2. Pick a section of the document that contains OCL constraints, preferably relating to one of the UML concepts that you know something about (e.g. Pseudostate on document page 585, but there are lots of other possibilities). Print out the relevant page(s) from the document but *do not look at the OCL yet.* Cover up the constraints section and gradually reveal so that you see the English explanation of a constraint but not the OCL. Consulting the relevant diagram which you'll typically find a few pages back in the document, try to write an OCL constraint that means what the English says. Compare what you write with what's in the UML spec.

Do not be surprised if in this process you find either

- a mistake in the OCL which is in the UML spec – most of it was written without tool support, and a few years ago there was a paper in the MODELS conference that systematically looked for mistakes using a recently developed OCL tool, and found many;

- a place where I have (very likely) severely simplified the version of UML that I taught in this course, or (less likely I hope) told you something that isn't strictly true according to the spec.

In either case, if you want my comments on what you've found, I'll be happy to give them: post on the Forum or email me.