

## Formal Models of Design Patterns II

### Task 1: Composite in RBML

Read and understand [1]. This paper presents RBML, a UML-like notation for representing design patterns. The formal backing of this notation (representing the design patterns' role models as extension of the meta-model) allows for formal treatment of design patterns in actual models.

1a)

Use RBML to represent the COMPOSITE design pattern.

1b)

Go back to the task sheet on extensibility patterns and look at your solution for task 1a). Use the RBML techniques presented in [1] to show that this is indeed a realisation of COMPOSITE.

### Bibliography

1. Robert France, Dae-Kyoo Kim, Sudipto Ghosh, Eungee Song, *A UML-Based Pattern Specification Technique*. IEEE Transactions on Software Engineering, Vol 30, number 3, pp 193-206, March 2004. *This paper is available online at the IEEE digital library by visiting <http://ieeexplore.ieee.org/Xplore/DynWel.jsp> and searching for it by title. You should have access to the digital library from any computer in the domain of the Computer Science Department.*

### Task 2: OWL Observant

Read and understand [1]. This presents an approach that uses Semantic Web technology (in particular ontologies) to model design patterns. An ontology can be viewed (grossly simplifying) as a special kind of class diagram modelling concepts and their relations. An ontology, thus, provides vocabulary allowing to talk about a specific domain.

2a)

Use the technology from [1] to model the OBSERVER design pattern.

### Bibliography

1. Jens Dietrich and Chris Elgar. *A Formal Description of Design Patterns Using OWL*. In Proc. 2005 Australian Software Engineering Conference (ASWEC'05), IEEE Press, 2005.

### **Task 3: Discussion: Formal Representation of Design Patterns**

From your experience with the pattern formalisations looked at so far, what are the benefits and drawbacks of attempts at formalising design patterns?