Self-study Questions 2
Due: November 9, 2009

1 Instructions for Answering
See Self-study question sheet 1.

2 Handing In
See Self-study question sheet 1.

3 Correcting Answers
See Self-study question sheet 1.

4 The Questions
1. What is separate compilation? Explain how it prevents a compiler from controlling whether a subclass creates a “true subtype” (in the sense of Liskov’s substitution principle).

2. What are the two major reasons for the use of inheritance?

3. Explain Liskov’s substitution principle and why it is important for object-oriented programming. Does it matter if a language is typed or untyped?

4. Can the use of inheritance cause slow down of a program? Why (not)?

5. In Java, subtyping implies subclassing. This is not the case for all languages, e.g., Eiffel. Explain the difference between subclass and subtype, and explain how one could add a construct to Java to break its subclass implies subtype property. (Feel free to steal this construct from Eiffel.)

6. Explain the terms static typing and dynamic typing.

7. Explain the role interfaces in Java play with respect to static typing.

8. Explain the differences between static and dynamic binding and what the consequences of using one or the other is on performance and flexibility.

9. What are the problems of multiple inheritance? Can you think of a way to have multiple inheritance without having any problems?

10. What is a type?

11. What is the difference between overloading and coercion?

12. If a method is translated into an ordinary function, what changes are necessary in order to provide access to the receiver?