Self-study Questions 3
Due: November 16, 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 a type in a set-theoretic interpretation?

2. Continuing with the set-theoretic interpretation, what is the relation between a type and a subtype? Also, what is a type test?

3. Explain covariance/contravariance in the context of method overriding.

4. What is type inference? How does type inference work in statically typed languages respective dynamically typed ones? Can it be useful?

5. What arguments are made in support of statically typed programming languages? What arguments are made in support of dynamically typed languages?

6. What is down casting and why is it more dangerous than up casting?

7. In what ways are some type errors and spelling errors similar?

8. What is a type signature?

9. What is a scope?

10. Explain why a Java class cannot statically know the precise type of this (there is one special case where it can), but the precise type of super.

11. Explain how Java 1.5 annotations relate to pluggable type systems.

12. What is the problem with type-checking arrays in the presence of polymorphism and subtyping? (Put differently, what is the problem of making A[] a supertype of B[] even if B extends A?)