OVERVIEW OF OBJECT-ORIENTATION  (Chapter 10)

1. What is the basic principle associated with subtyping? Give its name, and define it.

2. In the object-oriented programming community ‘polymorphism’ is often associated (or even defined as) dynamic lookup. How does this meaning of polymorphism relate to the definition of subtype polymorphism in Mitchell?

3. How does Mitchell define inheritance?

4. What is the difference between subtyping and inheritance? How do the keywords implements and extends relate to subtyping and inheritance in Java?

SIMULA  (Chapter 11)

5. What is a class in Simula 67? What Algol 60 entity did it evolve from?

6. What is an object in Simula 67? What implementation construct did it evolve from?

7. Do exercise 11.1 on p.327ff in Mitchell. But note that there is a typo and the first line of the code should read: ref(Point) r; instead of ref(Point) p;. There is also a mistake in the activation record template of 11.1(a); that activation record should contain two references, x and cp, instead of x and y.

SMALLTALK  (Chapter 11)

8. Do you think SmallTalk an incremental extension of Simula 67? Why or why not?

9. In SmallTalk, everything is what?

10. What are all operations in SmallTalk?

11. SmallTalk is not statically typed.
    (a) What other language(s) have we studied that shares this attribute?
    (b) What does subtyping mean in the absence of a static type system? Is it connected to inheritance? If it is, how so? If it is not, why not?

12. Give an example of SmallTalk code for which the same “message” will result in two different “methods” being executed. (You may assume that Point and ColoredPoint exist as shown in Figures 11.2, 11.3, 11.4, and 11.5 of Mitchell.)

13. Describe how SmallTalk finds the correct method to be executed and what runtime structures it uses to do so.


Note: If you collaborated with your classmates or used their notes, please note which classmates you collaborated with. If you use an external source, besides the text book, lectures, notes provided by the instructor, and your own intellect, please cite that source. Use quote marks if you are quoting material word-for-word from any source (including the text book).