1. (a) Under what circumstances does a subclass inherit methods from its parent class?

(b) If the variables in the parent class are all private, what modifications can be made to allow a child class to access them? Which of these solutions are better design choices?

2. What is the syntax for a generic class with one generic type? What is the syntax for a method that returns a generic type? What is the syntax for a method that takes in a parameter of generic type? What is the syntax for declaring a generic array variable?

3. Which of the classes in the quiz2 package is generic? Write a main method which instantiates it so that the generic type is a `String` and then instantiate it again so that its generic type is `Integer`. Then write code that uses at least two of its methods for each of the instances.

4. How can you modify the generic class so that it is not generic any more? What changes would you have to make to your code from question 3 so that it still runs? How is casting involved?

5. (a) What is an interface? What are the features of an interface? If there are variables in an interface, what are their accessibility modifiers?

(b) When are you allowed to say that a class implements an interface?

(c) What do you need to do to have a class implement an interface but not provide all the methods in that interface?

(d) On the Oracle website, find three useful interfaces. Which methods must you implement in order for you to say that one class implements all three of them?

6. (a) What is the syntax for designating a method as abstract? How is an abstract class different from a regular class? Find an example of an abstract class on the course website under “Lectures”. Does it contain any code? Is there any code missing?

(b) Must an abstract subclass of an abstract class implement all of the abstract methods from its parent? Must a non-abstract subclass of an abstract class implement all of the abstract methods from its parent? Must a non-abstract subclass of an abstract class include code for non-abstract methods from its parent?
(c) How many abstract classes can a subclass extend?

7. On the course website under “Lectures”, find code for classes Grade, LetterGrade, NumericGrade, and DemoAbstract. Draw a UML diagram for it. You can check your answer in the file on the course website entitled “UML.pdf”, on the slide with the title “Example: Abstract Class”.

8. On a UML diagram, what are the symbols for the accessibility modifiers public, private protected, and package protected? On a UML diagram, how do we denote static? final?

9. Revisit the slides that describe the Iterator pattern in “UML.java”. Write code that matches the UML diagram entitled “Iterator: Example In Java”.

10. So far, you have seen classes, interfaces, and generalizations in UML. There are a few other kinds of relationships between classes that we will cover in lecture this week. You can read about them here: http://www.sparxsystems.com/resources/uml2_tutorial/uml2_classdiagram.html

   Specifically, we expect you to read the following sections on that page (much of it will be review):
   
   – Class Diagrams
   – Classes
   – Interfaces
   – Associations (new)
   – Generalizations
   – Aggregations (new)

   Use this information to draw a UML diagram for the code in the quiz2 package.