Computer Science I — Spring 2017
Exam #1

This exam should have four pages. Closed book and notes.

Problem 1: [24 points]

a) What is the difference between an object and a class?

b) We’ve seen methods that print information to the terminal window, and also methods that return values. What’s an advantage of returning a value instead of printing it?

c) What is the scope of an instance variable?
public class OrcaCard
{
    private double balance;
    private double totalSpent;
    private int numTrips;
    private double taxCollected;
    private final double TAX_RATE = 0.065;

    public OrcaCard(double amount, OrcaCard other) {
        if (other.balance > 0) {
            balance = amount + other.balance;
            totalSpent = other.totalSpent;
            taxCollected = other.taxCollected;
            numTrips = other.numTrips;
            other.balance = 0;
            other.totalSpent = 0;
            other.taxCollected = 0;
            other.numTrips = 0;
        } else {
            balance = amount;
            totalSpent = 0;
            taxCollected = 0;
            numTrips = 0;
        }
        // ... the rest of the methods are omitted
    }
}

Problem 2: [25 points]

a) The code above is part of a potential solution to the OrcaCard homework assignment, though the method shown isn’t one you were required to write. What kind of method is it? (A mutator? Accessor? Constructor? Other?) Explain your answer.

b) In English, describe what the method does. (Try to focus on what it does rather than a step-by-step description of how it works.) To get in the right frame of mind, think about what you would write as a comment for the method.
Problem 3: [25 points]

Below, write a method called `largestOfThree` that takes three integer arguments. It should print a single line of output that includes all three input values, as well as the largest value of the three. For example, if the user passed in 5, 7, and 1 when calling the method, the printed output would be “The largest of 5, 7, and 1 is 7”.
public class Circle
{
    private int diameter;
    private int xPosition;
    private int yPosition;
    private String color;
    private boolean isVisible;

    // Methods not shown...

}  

Problem 4: [26 points]

The code above shows the fields in the Circle class. Below, define a constructor for the Circle class that takes a String as its input. It should set the values of the fields according to the contents of the string: If we pass the string "small" to the constructor, the diameter, xPosition, and yPosition should all be 30. If we pass "medium" to the constructor those three values should all be 60, and if we pass "large" or any other string, those three values should all be 120. Regardless of the input, the color should always be "yellow" and the circle should not be visible.