**CS211 Fall 2013**

Dr. Kinga Dobolyi

**Exam 1 Part 1**

Student Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Student G#: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Student signature for Honor Code:

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80 points total (will be recorded out of 100 on Blackboard)

65 minutes (for both parts of the exam together)

Part 1: Short Answer.

1. Draw what memory looks like after each of the following statement blocks (sub-parts are independent). Show garbage collection by crossing out items (i.e. do no erase anything for this question): (17 points)

a. String s = new String("Kinga");

String d = “David”;

b. float y = 3;

y = 4;

Person p = new Person("Sally", 19);

//assume Person stores a String *name* and int *age*

c. Integer i = new Integer(44);

i = new Integer(46);

//these are Integer objects, not primitive ints

1. A. Write a public class called **Animal** according to the following specifications:
   1. The class should have two mutable attributes, a **String** *species* and a primitive integer *weight*.
   2. The class should have a default constructor, which initializes both fields.
   3. The class should have a method to change the *species* of the Animal to an incoming argument
   4. The class should always ensure that the *weight* is a nonzero integer, and that the length of the *species* field is at least 1, but less than 20 (**String** has a **size()** method that returns the length of the **String**). (15 pts)