Spring ’13 CIS 212 Midterm Review

You may bring one page of notes, front and back, and a calculator.

Questions will be in short-answer format with partial credit for partial answers.

You will be asked to both read and write Java code, but only write code using primitive types (including arrays of primitive types) and System.out.println().

Topics:

- Basic Java: variables, control statements, methods
- Basic data structures: Arrays, ArrayLists
- Basic Object-Oriented Programming: constructors, getters/setters, inheritance
- GUIs: JButton, JLabel, GridLayout, BorderLayout
- Graphics: coordinate system, setColor(), fillOval()
- Recursion: base case, recursive call
- Searching and sorting: linear/binary search, selection/merge sort
- Complexity: $O(1), O(lg n), O(n), O(n lg n), O(n^2)$

Sample questions:

1. [5] Consider the following Java code:

   ```java
   for (int i = 0; i < n; ++i) {
       for (int j = 0; j < n; ++j) {
           System.out.println(i + j);
       }
   }
   ```

   What is the Big-O complexity of this function with respect to n? Why?

2. [5] Why is it good practice to use explicit getter/setter methods rather than public variables in Java classes?

3. [5] Consider the following Java code:

   ```java
   class A {
       public int get() { return 1; }
   }
   class B extends A {
       public int get() { return super.get() + 2; }
   }
   ```

   What is printed by System.out.println(new B().get())?