

SE1011: Half-Exam 3 Name:

This is a closed-book, closed-computer, etc. exam. You may use one 8.5"x11" sheet of notes, which you will turn in with your exam. Review all questions before you get started. Use the page at the end of the exam for extra work. Write your name on the front of each page. The exam is printed double-sided. Show all work.

1. (15 points) **Complete** a Java program that uses repeated multiplication to compute integer power x^y . The program should **print** the number to the console using `System.out`. Hint: Check that your program works for 3^0 and 3^1 .

```
Scanner in = new Scanner(System.in);
System.out.println("Please enter the base: ");
int x = in.nextInt();
```

```
System.out.println("Please enter the exponent: ");
int y = in.nextInt();
```

2. [10 points total]
 - a. (4 points) **Describe** the difference between how `public` and `private` methods can be used.

 - b. (6 points) **Give an example** of a line of code that uses the `this` keyword. **Describe** what `this` means in your line of code.

3. (15 points) **Draw** a UML diagram for the Runner class used in the program below.

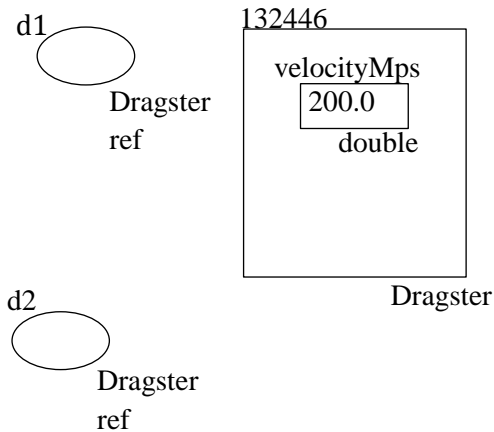
```
public static void main(String[] ignored) {
    Runner bob = new Runner("Bob");
    bob.setRecord(5.9);

    System.out.println("Bob's record time for the mile is "+bob.getRecord() +
        "minutes");
    bob.run();
    System.out.println("Run, Bob, run!");
}
```

4. (10 pts.) The following diagram that illustrates the state of memory at four points in a program on the right.

a. **Complete** the diagram //a2. Step a has been filled in entirely as an example. The Dragster class is implemented as described in the previous problem.

//a2 **[COMPLETE THIS]**



```
Dragster d1=null;
Dragster d2=null;
d1 = new Dragster();
d1.setVelocityMps(200);
d2 = new Dragster();
d2.setVelocityMps(200);
// a2
if(d1 == d2) {
    System.out.println("good");
} else {
    System.out.println("bad");
}
```

b. **Write** what is printed by the code-snippet after the comment "a2". **Explain** your answer.