

CS3723, Fall 2006, Homework #14

I. Exercise 14.1

II. Exercise 14.6

III. Consider the Java class Monitor:

```
public class Monitor {
    int x;
    int y;

    public static void main(String argv[]) throws InterruptedException {
        final Monitor mon = new Monitor();
        Thread one = new Thread() {public void run() {mon.thread1();}};
        Thread two = new Thread() {public void run() {mon.thread2();}};
        one.start();
        two.start();
        one.join();
        two.join();
    }

    void thread1() {
        x = 1;
        synchronized(this) {
            y = 1;
        }
    }

    void thread2() {
        int r1, r2;
        synchronized(this) {
            r1 = y;
        }
        r2 = x;
        System.out.println("r1 = " + r1);
        System.out.println("r2 = " + r2);
    }
}
```

Is Monitor correctly synchronized under the Java 5 Memory Model? Why or why not?

IV. Consider the prolog predicate `truncate2`, defined as follows:

```
truncate2(Xs, Ys) :- append(Xs, [A, B], Ys).
```

(Assume `append` is defined as on p. 484 of your text book.)

- What is the value of `Xs` that will be "returned" for the query `truncate2(Xs, [1, 2, 3, 4, 5, 6, 7])` .?
- What intermediate substitutions would be derived for `A` and `B`?
- List the recursive "calls" to the `append` and the resulting substitution at each layer of the recursion. (Note each level of recursion may have its own instance of variables that have the same name, make sure you distinguish these in some way.)