

Name: _____

Date: _____

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COMP3021: Java Programming In-class Exercise

In the class ThreadExercise, the output when calling “print” is “aaaaaaaaabbbbbbbbbbccccccccc”. We wish to reverse the output to be “cccccccccbbbbbbbbbbbaaaaaaaaaa” through the use of threads. However, we have the following restrictions: 1. Class ThreadExercise cannot extend any classes or implement any interfaces. 2. We cannot re-order any statements in the code; 3. We can only make intra-class modifications: changing method and field definitions.

```
public class ThreadExercise {
    private Thread t1, t2, t3;
    void printA(){
        for(int i=0;i<10;i++){
            System.out.print("a");
        }
    }

    void printB(){
        for(int i=0;i<10;i++){
            System.out.print("b");
        }
    }

    void printC(){
        for(int i=0;i<10;i++){
            System.out.print("c");
        }
    }

    void print(){
        printA();
        printB();
        printC();
    }
}
```

Solution:

```
public class ThreadExercise {
    private Thread t1, t2, t3;
    void printA(){
        for(int i=0;i<10;i++){
            System.out.print("a");
        }
    }

    void printB(){
        for(int i=0;i<10;i++){
            System.out.print("b");
        }
    }

    void printC(){
        for(int i=0;i<10;i++){
            System.out.print("c");
        }
    }

    void print() {
        t1 = new Thread(new Runnable(){
            public void run(){

                t2.join();

                printA();
            }
        });

        t2 = new Thread(new Runnable(){
            public void run(){

                t3.join();

                printB();
            }
        });

        t3 = new Thread(new Runnable(){
            public void run(){
                printC();
            }
        });
        t1.start();
        t2.start();
        t3.start();
    }
}
```