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SECOND SEMESTER SESSION A242

STIWK 3014 REAL TIME PROGRAMMING

(GROUP A)

Assignment 1

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Github Link: https://github.com/Chong0508/RealTime.git

Source Code

```
package Exercise9;

import java.util.concurrent.locks.Lock;
import java.util.concurrent.locks.ReentrantLock;
import java.util.Random;

public class Safelock {
   static class Friend {
       private final String name;
       private final Lock lock = new ReentrantLock();

       public Friend(String name) {
           this.name = name;
       }

       public String getName() {
           return this.name;
       }

       public boolean impendingBow(Friend bower) {
           Boolean myLock = false;
           Boolean yourLock = false;
           try {
               myLock = lock.tryLock();
               yourLock = bower.lock.tryLock();
           } finally {
```

```
                if(!(myLock && yourLock)) {
                    if(myLock) {
                        lock.unlock();
                    }
                    if(yourLock) {
                        bower.lock.unlock();
                    }
                }
            }
            return myLock && yourLock;
        }

        public void bow(Friend bower) {
            if(impendingBow(bower)) {
                try {
                    System.out.format("%s: %s has" + " bowed to
me!%n", this.name, bower.getName());
                    bower.bowBack(this);
                } finally {
                    lock.unlock();
                    bower.lock.unlock();
                }
            } else {
                System.out.format("%s: %s started to bow to me,
but saw that I was already bowing to him.%n", this.name,
bower.getName());
            }
        }
```

```
        public void bowBack(Friend bower) {
            System.out.format("%s: %s has bowed back to me!%n",
this.name, bower.getName());
        }
    }

    static class BowLoop implements Runnable {
        private Friend bower;
        private Friend bowee;

        public BowLoop(Friend bower, Friend bowee) {
            this.bower = bower;
            this.bowee = bowee;
        }

        public void run() {
            Random random = new Random();
            for(;;) {
                try {
                    Thread.sleep(random.nextInt(10));
                } catch (InterruptedException e) {}
                bowee.bow(bower);
            }
        }
    }

    public static void main(String[] args) {
```

```
        final Friend alphonse = new Friend("Alphonse");
        final Friend gaston = new Friend("Gaston");

        new Thread(new BowLoop(alphonse, gaston)).start();
        new Thread(new BowLoop(gaston, alphonse)).start();
    }
}
```

Output

```
"C:\Program Files\Java\jdk-21\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\IntelliJ
Alphonse: Gaston has bowed to me!
Gaston: Alphonse has bowed back to me!
Gaston: Alphonse started to bow to me, but saw that I was already bowing to him.
Alphonse: Gaston has bowed to me!
Gaston: Alphonse has bowed back to me!
Alphonse: Gaston has bowed to me!
Gaston: Alphonse has bowed back to me!
Gaston: Alphonse has bowed to me!
Alphonse: Gaston has bowed back to me!
Alphonse: Gaston has bowed to me!
Gaston: Alphonse has bowed back to me!
Alphonse: Gaston has bowed to me!
Gaston: Alphonse has bowed back to me!
Gaston: Alphonse started to bow to me, but saw that I was already bowing to him.
Gaston: Alphonse has bowed to me!
Alphonse: Gaston has bowed back to me!
Alphonse: Gaston has bowed to me!
Gaston: Alphonse has bowed back to me!
Alphonse: Gaston has bowed to me!
```