Quiz 3:

3: Use semaphores to guarantee that the output is R I O OK OK OK (we assume print is atomic)

global Semaphore x = new Semaphore(0);

global Semaphore y = new Semaphore(0);

global Semaphore z = new Semaphore(0);

thread {

print ( " R " );

x.release();

z.acquire();

print ( " OK " );

z.release();

}

thread {

x.acquire();

print ( " I " );

y.release();

z.acquire();

print ( " OK " );

z.release();

}

thread {

y.acquire();

print ( " O " );

z.release();

z.acquire();

print ( " OK " );

z.release();

}

4:

1. What are the possible values for x? 0, 1, 2, 3
2. Is it possible to use semaphores to restrict the set of possible values of x to be just two values? Yes

7:

1. Use semaphores to guaranteee that at all times the number of A’s and B’s differs at most in 1.

global Semaphore x = new Semaphore(1);

thread {

while(true) {

x.acquire();

x.acquire();

print("A");

x.release();

}

}

thread {

while(true) {

print("B");

x.release();

}

}

1. Modify the solution so that the only possible output is ABABABABAB...

global Semaphore x = new Semaphore(1);

global Semaphore y = new Semaphore(0);

thread {

while (true) {

x.acquire();

print( "A " );

y.release();

}

}

thread {

while (true){

y.acquire();

print( "B " );

x.release();

}

}