CS 511 – Quiz 4: Semaphores

6 October 2023

Names:
Pledge:

Exercise 1

A common lounge is used by students and faculty. There can be any number of students and faculty in the lounge at any given time. Robot cleaning machines are available to clean the lounge every now and then. In order to do so, there can be no faculty nor students in the lounge at the time. Moreover, since robot cleaning machines interfere with one another, only one robot cleaning machine can be cleaning at any given time. Below is a stub you can use as guideline. You need no additional semaphores but you may need other variables.

```
import java.util.concurrent.Semaphore
Semaphore mutexS = new Semaphore(1)
Semaphore mutexF = new Semaphore(1)
Semaphore studentPermit = new Semaphore(1)
Semaphore facultyPermit = new Semaphore(1)

final int S = 10   // Number of students
final int F = 10   // Number of faculty
final int CM = 3   // Number of cleaning machines

S.times {
    int id = it
    Thread.start { // Student
    // complete
    }
}

F.times {
    int id = it
    Thread.start { // Faculty
    // complete
    }
}

CM.times{
    int id = it
    Thread.start { // Clean
      while (true) {
        // complete
      }
    }
}
```