

Operating System Labs Jan-May 2018

Synchronization

Assume the following scenario:

There is a TA who helps undergraduate students with their programming assignments of Operating Systems Lab. The office of the TA is very small and has room for only one desk with a chair and computer. There are three chairs in the hallway outside the office where students can sit and wait if the TA is currently helping another student. When there are no students who need help, the TA sits on the chair and takes a nap. If a student arrives and finds the TA sleeping, the student must awaken the TA to ask for help. If a student arrives and finds the TA currently helping another student, the student sits on one of the chairs in the hallway and waits. If no chairs are available, the student will come back at a later time.

Using threads, mutex locks, and semaphores, implement a solution that coordinates the activities of the TA and the students.