CS241 Lawrence Angrave L14 – The Critical Section Problem

Some more C functions for you: sigprocmask pthread\_sigmask

pthread\_self() atexit sigaction

**Candidate** # 0 (Review) Protect our critical section with a mutex. But how should it work!?

pthread\_mutex\_lock(p\_mutex\_t\* m) { while(m->lock) {}; m->lock = 1;}

pthread\_mutex\_unlock(p\_mutex\_t\* m) { m->lock = 0; }

Problems?

**Candidate** # 1

|  |  |
| --- | --- |
| wait until your flag is lowered  raise my flag  // *Do Critical Section stuff*  lower my flag | wait until your flag is lowered  raise my flag  // *Do Critical Section stuff*  lower my flag |

// Threads do other stuff and then will repeat at sometime in the future

Problems with 1b? Fix?

**Candidate** #2

|  |  |
| --- | --- |
| raise my flag  wait until your flag is lowered  // *Do Critical Section stuff*  lower my flag | raise my flag  wait until your flag is lowered  // *Do Critical Section stuff*  lower my flag |

// Threads do other stuff and then will repeat at sometime in the future

Problems with 2?

**Candidate** #3

|  |  |
| --- | --- |
| wait until my turn (turn==id?)  // *Do Critical Section stuff*  turn = *yourid* | wait until my turn (turn==id?)  // *Do Critical Section stuff*  turn = *yourid* |

// Threads do other stuff and then will repeat at sometime in the future

Problems with 3?

Three desirable properties of the solution to the Critical Section Problem?

**Candidate** #4

|  |  |
| --- | --- |
| raise my flag  if your flag is raised, wait until my turn  // *Do Critical Section stuff*  turn = *yourid*  lower my flag | raise my flag  if your flag is raised, wait until my turn  // *Do Critical Section stuff*  turn = *yourid*  lower my flag |

// Threads do other stuff and then will repeat at sometime in the future

Problems with 4?

**Candidate** #5

|  |  |
| --- | --- |
| raise my flag  while(your flag is raised) :  if it's your turn to win :  lower my flag  wait while your turn  raise my flag  // *Do Critical Section stuff*  set your turn to win  lower my flag | raise my flag  while(your flag is raised) :  if it's your turn to win :  lower my flag  wait while your turn  raise my flag  // *Do Critical Section stuff*  set your turn to win  lower my flag |





