Santa Clara University

Computer Science & Engineering Department

CSEN 283: Operating Systems,

Winter 2024

Programming Project 3

Suggested Reading for this assignment (Please note that you can find many other great tutorials by simply searching on Google!).

You may find the followings useful for part of this project:
- pthread_mutex_t *mutex;
- pthread_cond_t *condition;
- pthread_create ();

Please note that, to compile multithreaded program, you need to specify "-lpthread" as follows

gcc -o output.txt program.c -lpthread

The goal of this assignment is to write a multithreaded program using "C" language in Linux environment that explores synchronization challenge. For this part, assume that, we have a shared variable CurrentID. This is initialized to 1at the beginning.

Now create 5 threads in your program and assign ID 1,2,3,4,5 to them respectively. You can pass the ID as a parameter when you create the threads.

Each of the threads will try to access the variable "CurrentID".
Whenever a thread acquires the variable, it checks whether the CurrentID is equal to its own Id or not.

If it is not equal, it will output "Not My Turn!", then print its threadId, and then release the variable.

If it is equal, the thread will print "My turn!", then print its threadId, increase the CurrentID by 1, and then release the variable. However, after increasing CurrentID by 1, the thread will check if the value is 6 or not. If it is 6, it will reset it to 1 before releasing the variable.

The program should execute until each thread prints "My Turn!" 10 times. Once a thread prints for 10 times, it terminates.

Count the number of times each thread prints "Not my Turn!" and include that in the report.

What to submit
1. Submit source code file as project3.c (you will get points off if filenames are incorrect)
2. Submit the output results and explanations of your code in a report file. You can copy paste your code in the file if you want**.**