

WENTWORTH INSTITUTE OF TECHNOLOGY

College of Engineering and Technology
Department of Electrical Engineering and Technology

Operating Systems
Spring 2018

Lab 6

Write a program that uses the pthreads library to create a secondary thread of execution, such that the thread function and the main routine have a number of common variables; an array of N characters (N=4), a counter, an in variable and an out variable. The main routine and the secondary thread use the variables to implement a queue data structure (as in slide 2 of lecture 8a). Use the **Peterson's method** to synchronize access to the shared counter.

The main thread needs to create a c-string with the content "Hello world, this is COM3499!". The c-string needs to be declared as a local variable inside the main routine and hence will not be visible to the secondary thread (alternatively you may create it as a global variable with the `__thread` keyword, but make sure you initialize the c-string array inside the main routine).

The main thread then passes the content of the c-string to the secondary thread through the queue, character-by-character. The Secondary thread reads the characters from the queue, character-by-character, and prints them to the screen.

Lab questions:

1. Mention two disadvantages or limitations in using this method for communicating between threads or processes.
2. Why is it that the method described in slide 1 of lecture 8a can use a maximum size of N-1 entries for the queue (as opposed to N as in the method implemented in this lab) ?

What to hand in (using Blackboard):

- Your ".c" file(s) (with appropriate comments). Do not attach project or make files.
- A screen shot of your terminal window(s).
- A document containing a table of result and answers to the lab questions.

RULES:

- Submit only .c, .h, image or document files. Do not submit .zip files or files with no or unknown extensions.
- Each group may consult with other groups/students about GENERAL concepts or methods, but copying code (or code fragments) or algorithms is NOT ALLOWED and is considered cheating (whether copied from other students, the internet or any other source).
- Each member of a group is required to contribute, and will be required to explain and defend every part of work done.
- Only one set of files should be submitted for each group.
- **To get full credit, you must attend the lab, show me your progress before you exit the lab (this goes for every student in the group), and submit required files before the posted deadline.**