# WENTWORTH INSTITUTE OF TECHNOLOGY

College of Engineering and Technology
Department of Electrical Engineering and Technology

Operating Systems
Spring 2018

## Lab 5

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 common variable (you may name if `counter`) that is shared between them. The main routine should have a loop that increments the `counter` `n` times, where `n` is a parameter passed to your program during its invocation from the command-line. While the main thread is running its increment loop, the secondary thread shall be decrementing the shared `counter` variable `n` times and then exit.

After the main thread has incremented the `counter` `n` times, it shall wait for the secondary thread to exit, and then print the value of `counter` to the screen.

You shall run your program multiple times (let's say 10) for each value of `n` (which you pass from the command-line), and `n` should perhaps change from 10 to 100,000,000 in a logarithmic manner (i.e. multiply by 10 after each experiment).

Tabulate your results by recording the values of `n` and `counter` in each experiment, and then answer the following questions:

1. Does the value of the counter change from one experiment to the other, or is it constant? If it is constant, what is the value? Explain why if not constant.
2. Is there a region of n where the behavior is different from the behavior in other regions? Explain why if any.

## Hints

You may want to search for the term "atomic instructions".

## 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 form 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.**