WENTWORTH INSTITUTE OF TECHNOLOGY

College of Engineering and Technology
Department of Electrical Engineering and Technology

Operating Systems
Spring 2018

Lab 8

Write a program that uses the skeleton C file provided (lab8_skeleton.c) to implement a solution to the bounded buffer problem using semaphores, as discussed in lecture 9a (slides 3 to 5). An implementation that uses a mutex is included in the skeleton file and is similar to lecture 9a (slide 2) except that the critical section is protected by a mutex.

The macro BUF_SIZE is defined to be 1000.

To compile your code such that it uses the mutex implementation (already coded in lab8_skeleton.c), compile use:

```
gcc -pthread -o lab8 lab8.c
```

To compile the program using semaphores, define the macro `USE_SEMS` when invoking the compiler:

```
gcc -pthread -o lab8 lab8.c -DUSE_SEMS
```

Run both programs multiple times for an input value of 1000 and 2000 for n. Compute the average CPU time for the reader thread for both cases of n, i.e. you may run your program using:

```
./lab8 1000
```

Or

```
./lab8 2000
```

Submit a text file showing the average CPU time for the reader thread using the two methods and the two values of n, then answer the following questions:

1. Did the two methods roughly consume the same CPU time for the reader thread?
2. Why?

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) for one of the runs for each of the 2 methods.
- A document containing the results 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.**