**CSI 333 - Programming at the Hardware-Software Interface**

**(Lab and Discussion Classes)**

# Reading Materials and Resources

* Lecture Slides (Class 12 – Threads)

**Threads and Semaphores**

# Objectives

* experiment with threads and semaphores
* practice with creating threads and semaphores
* answer questions

**For each of these tasks, use the “time” command line program to run your program. Note the times.**

1. Study Threads slides
2. Write a program that creates 1,000,000 random integers 0-9. It should then create two threads, which iterate over ½ of the integers, summing them using a single global variable. When both threads complete, the main thread should print the sum, then sum the array itself and print the correct value.
3. In the threads, wrap the access to the single global variable with a semaphore. Rerun.
4. Change the threads to use a local variable for summing, and then update the global with the semaphore lock. Rerun.

Hints:

Don’t forget to compile with –lpthread

Make your semaphore global, your pthread structures local.