**CS-418 L01 – Operating Systems**

**Homework 5 – Threads**

**Points: 75**

**Solving a Problem Using C Threads**

***Requirement***

*Build a C program using pthread.h thread support that finds the maximum and minimum values in an array and time the performance.*

***Deliverables***

Your C program (as a .c file) and the captured runtime output from the 3 executions of your program.

***Procedure***

/\* Get the [**Hw 5 files**](https://capitol.instructure.com/courses/3199/files/348678/download?verifier=iFHlOamx3Y6JIICR3r0zSAMLm9rMgOjfmRswbUlR&wrap=1) (not really necessary – it’s only a (slightly better formatted) copy of this document \*/

Write a C program that finds the maximum and minimum values in an array of random ints using threads. You must use the functions in pthreads.h to create and manage the threads. The array must contain 10,000 randomly generated ints in the range 0..50,000 with no duplicated values. You must run your program using 2, 10, and 100 threads. Your program must display the maximum and minimum values and how long it took each run to execute. Create the array when the program begins. Use the identical array values for each run. The program should display the first 10 and last 10 values in the array at the start of execution. Do NOT sort the array. Capture the runtime output for each of the three executions along with the timing information, saving them all in a single MS Word document.   
  
Note: do NOT write 3 separate programs. Only write one program. Your program should contain a “master loop” that runs the three variations of 2, 10, and 100 threads. The precise same data must be used for each timing.

/\* See ***Deliverables*** above for what to submit for this assignment \*/