

Programming Assignment 2 – early release

Due Date: Mon, 11/5, 11:59pm

Please read these instructions carefully. You will be graded based upon meeting all requirements stated in this assignment.

Background

We now have a working serial producer/consumer program. Congratulations! We also have it benchmarked for runtime so that we can compare its relative performance.

Problem Statement: parallel producer - consumer

A natural way to parallelize producer-consumer is to create one thread for the producer module and a second thread for the consumer. Using your existing serial program as a base, create this natural parallel version of your program using pthreads.

All relevant requirements from lab 1, unless otherwise noted, apply to this program.

Of particular note:

- All input should be read from stdin (as in lab 1).
- Use an array of struct work_entry as your main work queue (as in lab 1).
- Output should be printed on stdout and in the same format as lab 1.
- The order of your output need not be the same as the order of the input data.
- Per the pthreads API, you will need to encapsulate any data structures being sent to your thread routines inside a struct.
- Do not use any global variable for this assignment.
- Use the same input data files as lab 1.
- Use the same three methods for instrumenting your parallel program as were used in lab 1, i.e. time(1) (the unix command), time(2) (unix system call), and clock(3) (unix library routine).
- Provide a makefile for your program that runs without parameters (i.e. typing “make” alone with successfully build your program).
 - Name your executable file “lab2_pthreads.”

Report Requirements

Run your parallel program against all of the test files provided, providing the following.

- Report the runtimes for both your serial and parallel tests.
- Explain your results.

Testing & Submission Instructions

- Submit your program files from an Owens login node using the OSC submit system: https://www.osc.edu/resources/getting_started/howto/howto_submit_homework_to_repository_at_osc.
 - In your home directory, create a directory call “lab2” and place all of your files for submission in that directory. Submit this directory.
 - Include only your source code. Do not submit binary files, test data files, or results of your program runs.
 - submit this assignment to “lab2”
- Test input files are available on Owens in the /fs/project/PAS1421 directory.
- Submit your report in .pdf format via Carmen.