MULTITHREADED PROGRAM

Homework #3

By

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Problem Specification:

**Re-do Homework 1 as a multi-threaded program in OpenMP and add an extra command-line argument.**

Program Design:

**When I designed the game program initially for Homework 1, I originally designed game() to be invoked by pthreads, so converting the primary loop to work for OpenMP was less of a hassle. The way I designed the outer, per-generation loop is inherently sequential, so I did not add it to the parallelization.**

Testing Plan:

**I left the print statements in both programs and used diff to compare two scripts that were otherwise identical to see if, other than time, there was any other difference in outputs; there was none.**

Test Cases:

**The scripts were as follows:**

#!/bin/bash

./hw3 3 3 10

./hw3 3 10 10

./hw3 5 5 10

./hw3 5 10 10

./hw3 5 20 10

./hw3 10 10 10

#!/bin/bash

./hw1 3 3

./hw1 3 10

./hw1 5 5

./hw1 5 10

./hw1 5 20

./hw1 10 10

**One run of diff yielded:**

1c1

< Time taken = 0.000001 seconds

---

> Time taken = 0.000002 seconds

12c12

< Time taken = 0.000002 seconds

---

> Time taken = 0.000005 seconds

23c23

< Time taken = 0.000003 seconds

---

> Time taken = 0.000010 seconds

38c38

< Time taken = 0.000006 seconds

---

> Time taken = 0.000016 seconds

53c53

< Time taken = 0.000009 seconds

---

> Time taken = 0.000031 seconds

68c68

< Time taken = 0.000005 seconds

---

> Time taken = 0.000064 seconds

**Only the times, and not the printed output, differed.**

Analysis and Conclusions:

**https://gitlab.cs.uab.edu/jprob/432hw3**

**As you can see, there is a bit of a problem here; there was no speedup, and it in fact slowed down. Both hw1.c and hw3.cpp were compiled using the intel compiler. I began to look for information for profiling the program using icc but could not understand the instructions. This likely has to do with the time that omp takes in allocating the memory for the intermediate boards.**

References:

**https://stackoverflow.com/a/34979926/9295513**