Mark Demore, 2d Lt

CSCE689 – HW3

**CODE:**

<https://github.com/mdemore2/AFIT-CSCE689-HW3-S>

**NOTE:**

On Ubuntu VM – multithreaded was slower than single process, but diff was correct

On Ubuntu WSL – multithreaded was faster than single process, but diff was incorrect

**QUESTIONS:**

1. Using a multi-core machine (ideally 4 or more cores), graph the speed of the algorithm from single thread to four times the number of cores (4 core = 4x4 = 16 threads). Explain where performance levels out and why. Does it continue improving past the number of cores? Explain.

**Test Specs:** CPU: Intel i5-4690K, 4 cores

Primes Calculated: 2147483648

The performance somewhat levels out after 4 threads, the number of cores. At this point the extra threads are fighting for CPU time and the process will not get any faster.

2. Run your algorithm with the number of threads equal to the number of cores. Do this at least 5 times and record the performance. Was the performance the same or did it vary? Explain.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Run** | 1 | 2 | 3 | 4 | 5 |
| **Time (μs)** | 9733707 | 9917334 | 11156233 | 11280717 | 10309801 |

The performance varied, in part because of background processes running, but also because the CPU will schedule threads differently with each run. Some threads may spend more time waiting when they could be processing new values.