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High Performance Computing

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Lab Report

Assumptions

For calculating the speedup, the serial, pthread, and openmp programs were run with the 10240 image. The programs were timed in the cluster environment.

Pthread and Openmp speedup

thread	serial	pthread	omp
1	34051042	48493543	42868587
2	34051042	24453476	21468950
4	34051042	12568978	11256731
8	34051042	6741348	6085884
16	34051042	3498858	3333315

Pthread vs OpenMP

thread	omp/pthread	omp-pthread
1	1.131213935	0.09213538431
2	1.139015928	0.1935772727
4	1.11657443	0.315815718
8	1.107702349	0.5440124431
16	1.049663173	0.4833242146

A good metric to quantify programmer's effort for using pthread or openmp is the accumulation of overhead that occurs when using pthreads. It seems that there's a noticeable increase in time when using pthread that I suspect is the result of overhead. The time does not necessarily affect the efficiency, since the speedup of pthread vs openmp are roughly the same. However, when you take the difference of the speedups, it's clear openmp is always a bit faster.