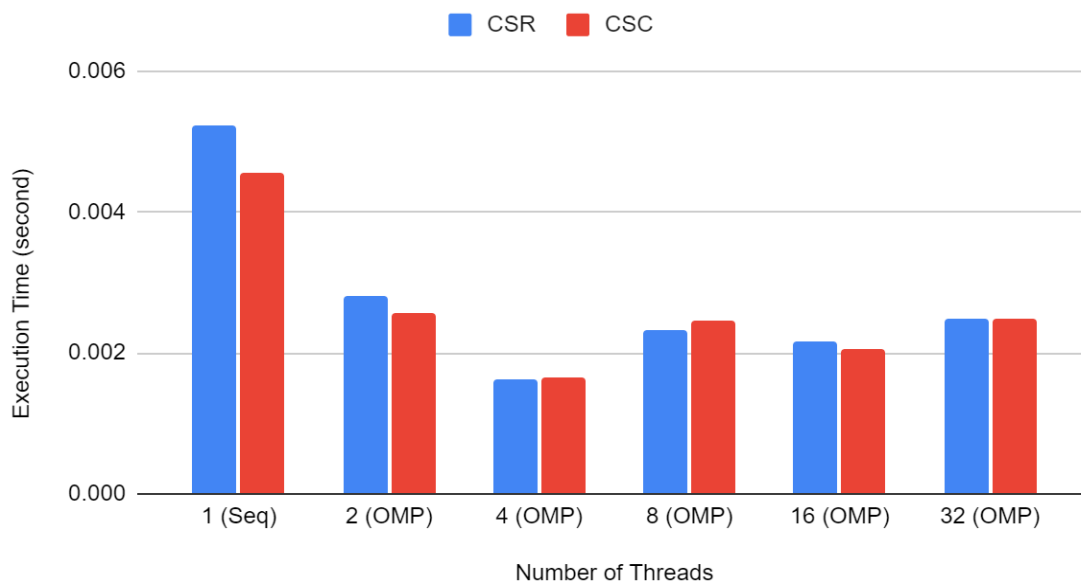Huy Dinh Tran
htran197
ID: 862325308

PA1 Part 2 Report

Execution Time (in second ran with 8 iterations using matrix3.txt)

Threads	1 (Seq)	2 (OMP)	4 (OMP)	8 (OMP)	16 (OMP)	32 (OMP)
CSR	0.005217	0.002802	0.001614	0.002325	0.002161	0.002477
CSC	0.004556	0.002573	0.001651	0.002457	0.002060	0.002497

Execution Time vs Number of Threads

Note: My machine has an Intel Core i7-6700K 4 Cores 8 Threads with 32GB DDR4-2133

From the result above, we can clearly see that parallel beats sequential computation up to 3.23X for CSR and 2.76X for CSC. I got the best performance using 4 threads compared to a higher number of threads. This is because of the extra overhead and communication when we use more threads which decreases the performance in our cases.

In addition, CSC runs a bit faster than CSR in some cases. One reason that I could think of is CSC improves cache locality because the format indexing and pointer work with the cache better.

Also, for CSC, I got slightly different decimal rounding outputs between sequential and parallel (after 3rd decimal place). I think this is because of some internal OpenMP problems that cause these differences since CSR outputs are consistent and identical.