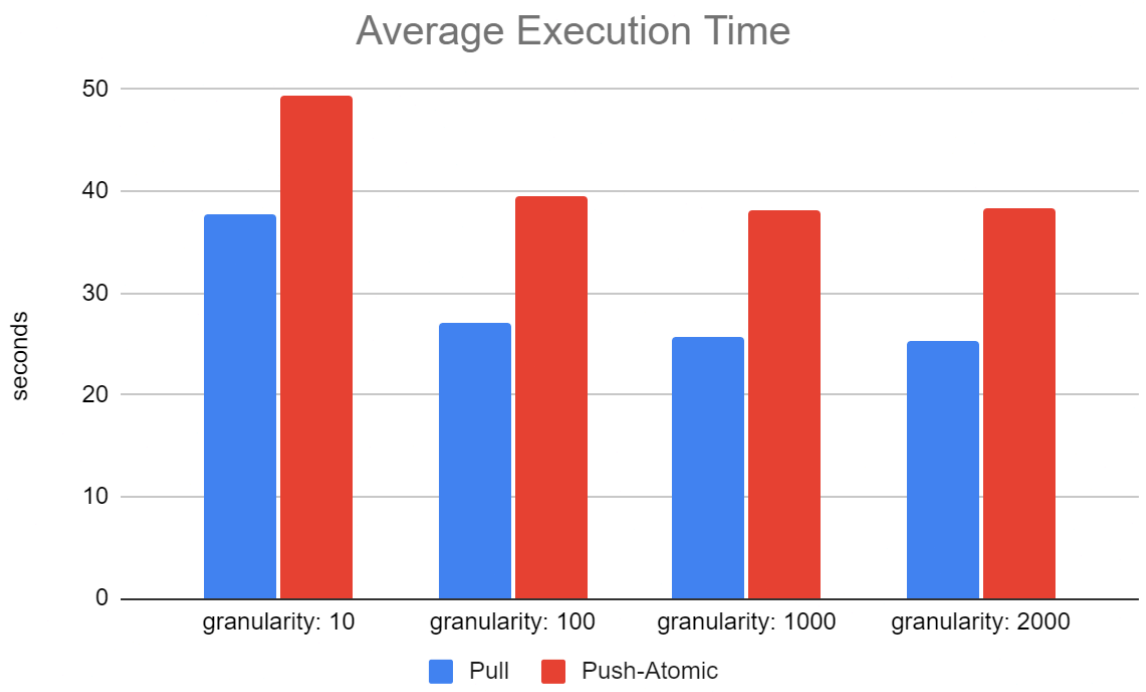
CMPT 431 Assignment 4 Report Siu Yu Chau 301604828 2024-10-15

Q1. Run each of your two parallel programs with strategy 4 above using 8 threads on the test_25M_50M data set with granularities of 10, 100, 1000, 2000. Each of your parallel programs should run 3 times, each including 20 iterations on the slow cluster using the default floating point data type. {Total number of runs is 2 (parallel versions) x 4 (different granularities) x 3 (number of runs for each version/thread combination) = 24 runs]

Plot a graph with average execution time on the y-axis, thread count on the x-axis where each granularity has 2 bars, one for the average runtime of each of your parallel versions. Your graph should be something like this (obviously with different values):



Q2. Based on data from the graph in Q1, which of the four granularities is better for pull? And which is better for the push_atomic algorithm?

Granularity 2000 is the best for pull.
Granularity 1000/ 2000 is best for Push-Atomic. Result is really close between the two.

We can see using granularity 10 is slowest. And using granularity 100 or above is much quicker. However the granularity has diminishing returns, so adding more does not result in significant reduction.
Increasing granularity can reduce the time to get next vertices. More vertices can be handled in one batch. Using and granularity above 100 is good.