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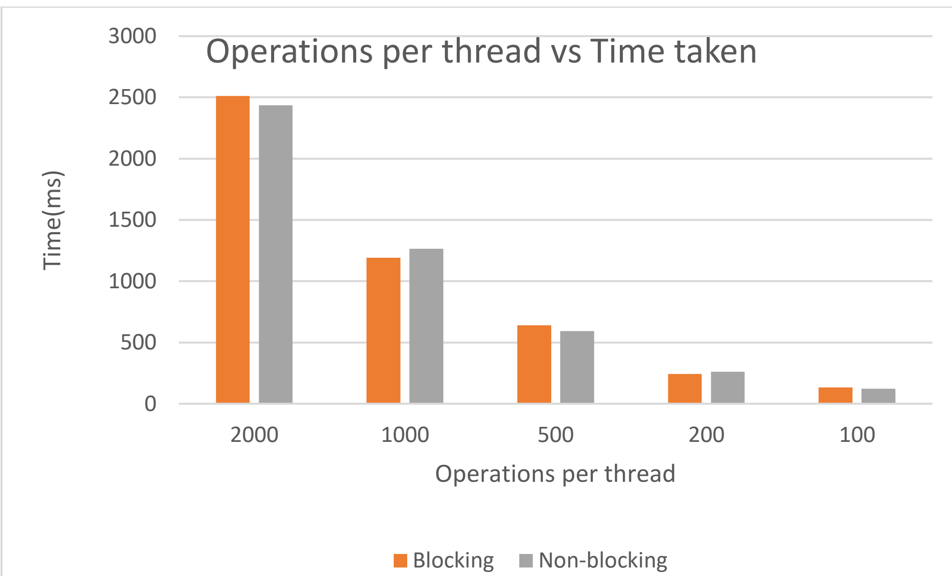
Assignment 3

Q3

Both algorithms do not follow sequential execution. However, Q1 can have sequential equivalent. The order of acquisition of semaphores can be fixed. The sleep and wake of threads in Q2 is randomised and the order of thread execution cannot be predicted.

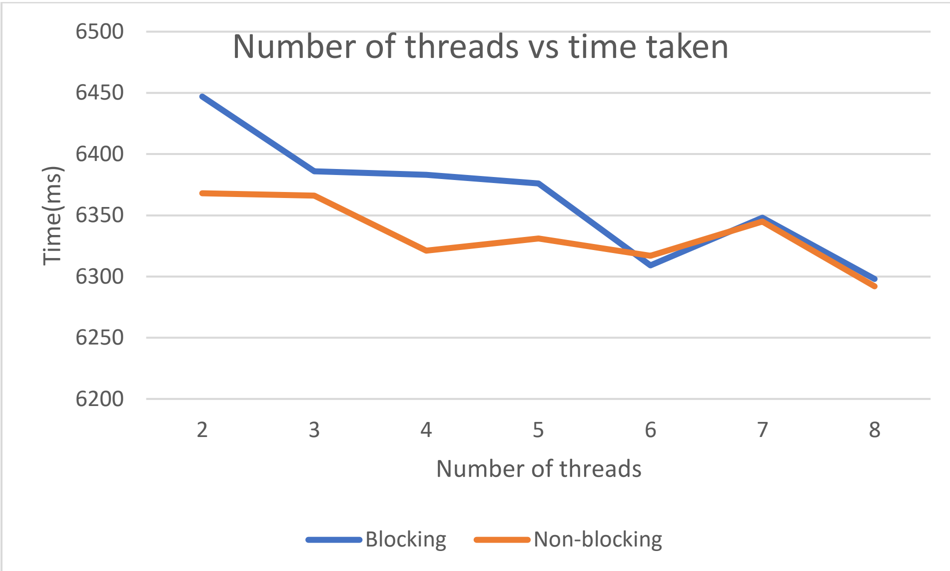
Q4

For the following 2 threads, 0.5 probability and 1ms delay was chosen



As you can see, Lock free was fast across the board. This is unsurprising since Semaphores are heavy weight.

For the following non-blocking was mostly faster but converged as number of threads increased



The convergence between blocking and non blocking is the result of looping over and over with more threads trying to attain the same resource.

But in general, lock free was faster thanks to the lack of semaphore blocking.

It is interesting to see that despite having to do far more operations, the time taken for n*threads is nearly constant, Indicating great parallelism. If there is an enough of a sleep delay between threads ops, even 100 threads take just Slightly more time than a single thread doing 1/thread number of total jobs