2022 NYCU OS HW2 report

陳存佩 109550171

Question	Answer
Q1. (5pts) Briefly describe your design for the add, multiple function of matrix, the thread management. Also, describe the number of threads in the Multi-thread program.	透過迴圈建立 thread，大家都跑一樣的 add & multiple function，function 內會呼叫 global variable row，用來判斷做到哪一行（每個 thread 沒有預先設定要做哪行，看當時 row 而定），row 相關的變動跟判斷被包在 critical section 內。 經過測試，在 thread = 10 達到最好的 speedup，因為工作站是 4 cores，基本上超過 4 都會有相近的結果。
Q2. (15pts) Try at least 3 kinds of number of threads, and compare the difference in time.(Take screenshots of the time of each case) Also, explain the results.	thread number: 2 2248968 2528950360 real 0m0.362s thread number: 4 2248968 2528950360 real 0m0.204s thread number: 10 2248968 2528950360 real 0m0.202s thread number: 20 2248968 2528950360 real 0m0.203s

	在 thread number=2~4 時有明顯的進步，超過 4 後因為受限工作站本身硬體設備的限制，都維持在相近的數值上。 **硬體規格** • 硬體 ◦ 4 Cores Virtualized `Intel(R) Xeon(R) Gold 6126 CPU` ◦ 16 GB Memory
Q3. (10pts) Show the best speedup between multi-thread and single-thread. (Take screenshots of the time of single-thread and multi-thread) Also, explain why multi-thread is faster.	``` bash-4.4$ time ./single < input.txt 2248968 2528950360 real 0m0.731s thread number: 10 2248968 2528950360 real 0m0.202s ``` Speedup = 0.731/0.202 = 3.6 因為 multi-thread 可以平行同時處理多 row 的加跟乘，所以速度會比較快。