

Q2 Assignment 2 Report

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November 2022

1 Computer & Compiler Details

1.1 Basic Information

Architecture : x86_64
CPU op-mode(s) : 32-bit, 64-bit
Address sizes : 48 bits physical, 48 bits virtual
Byte Order : Little Endian
CPU(s) : 16

1.2 CPU Details

Vendor ID : AuthenticAMD
Model name : AMD Ryzen 7 PRO 5875U with Radeon Graphics
CPU family : 25
Model : 80
Thread(s) per core : 2
Core(s) per socket : 8
Socket(s) : 1
Stepping : 0
Frequency boost : enabled
CPU(s) scaling MHz : 44%
CPU max MHz : 4546.8750
CPU min MHz : 1600.0000

1.3 Cache

L1d cache : 256 KiB (8 instances)
L1i cache : 256 KiB (8 instances)
L2 cache : 4 MiB (8 instances)
L3 cache : 16 MiB (1 instance)

1.4 Compiler Details

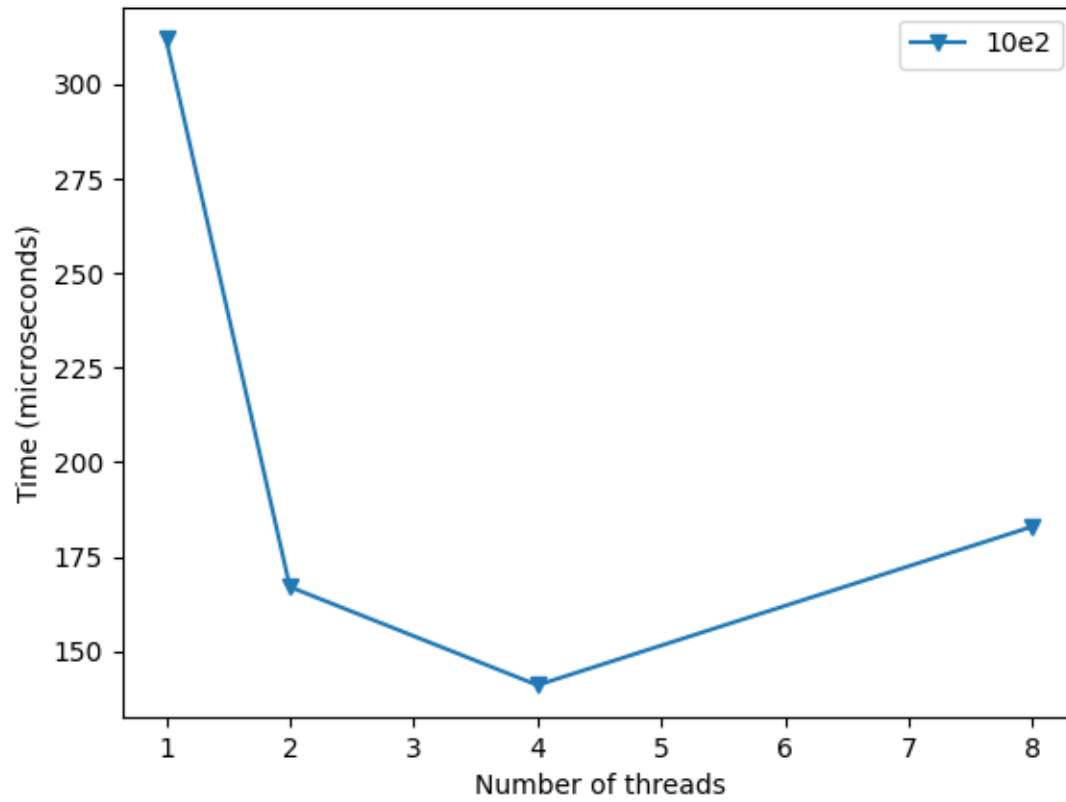
Compiler : gcc (GCC)
Version : 10.2.1 20201203

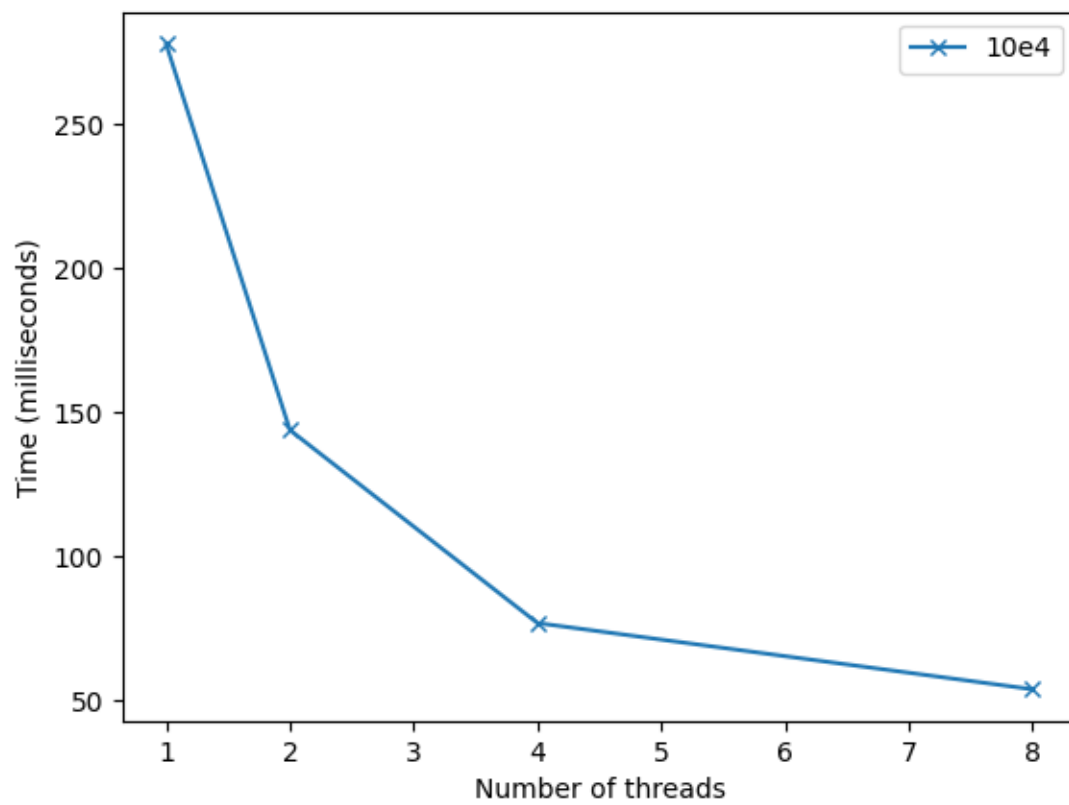
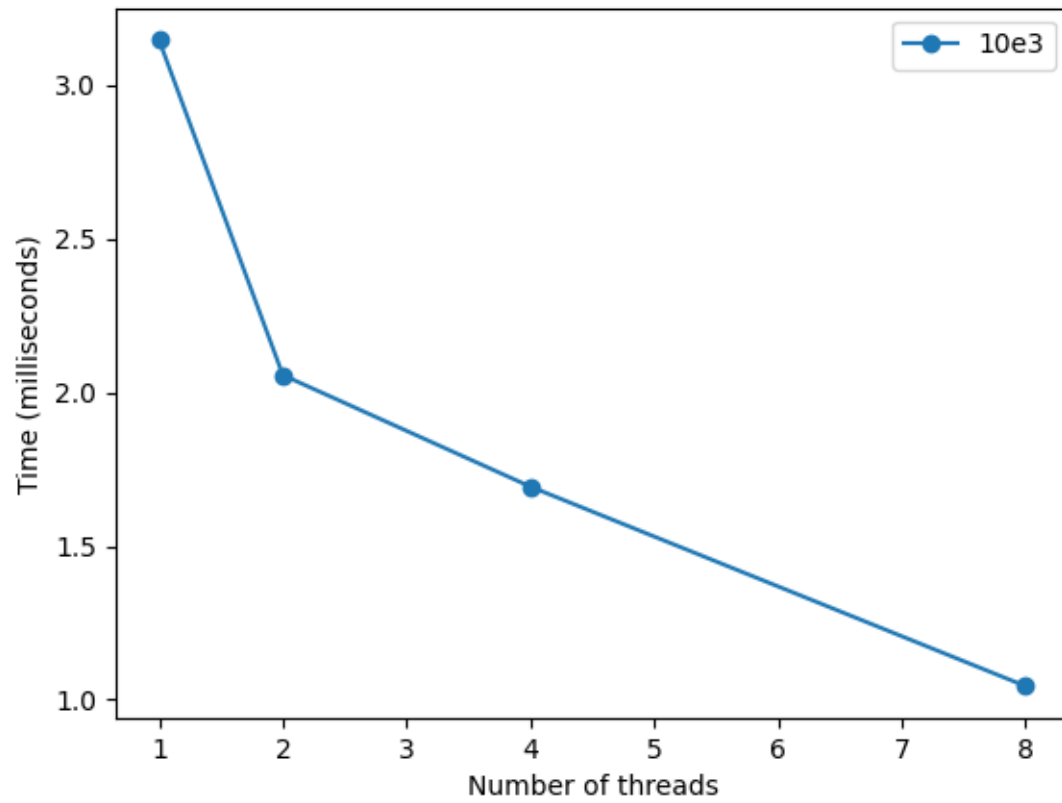
2 Results

I tested with the 3 samples of data given and plotted the time taken for matrix vector multiplication with 1, 2, 4 and 8 threads.

Time Taken:

Test Case	Number of Threads	N_1e2	N_1e3	N_1e4
1	1	0.312ms	3.146ms	278ms
2	2	0.167ms	2.056ms	144ms
3	4	0.141ms	1.693ms	77ms
4	8	0.183ms	1.044ms	54ms





2.1 Analysis

We can see that as we increase the number of threads, the time taken decreases. But the decrease is not linear as the whole program is not parallelizable.

We also see that in case of low input data the time increases with increase in number of threads after crossing a threshold. This happens due to the information passing time being more than the speedup obtained.