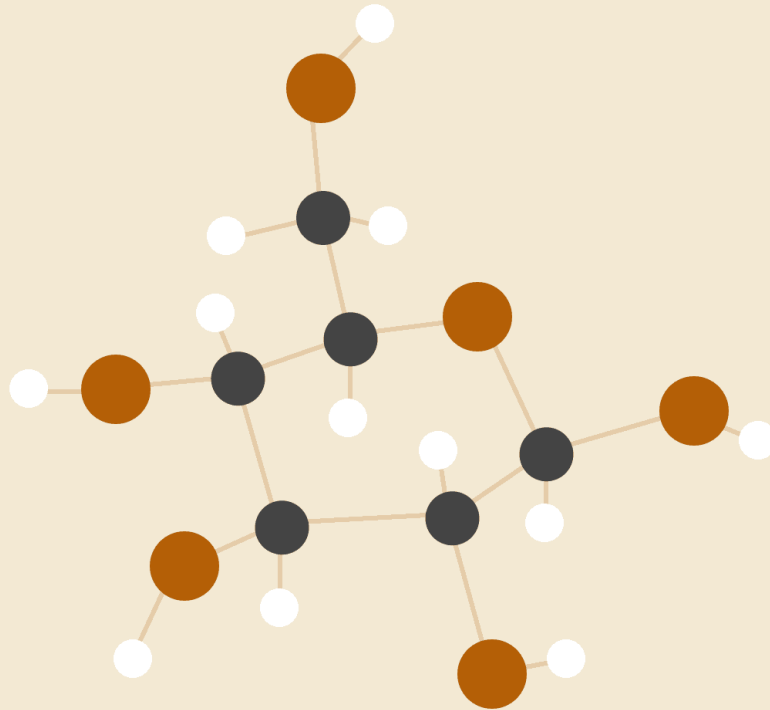


FINAL PROJECT REPORT

Comparison of sorting algorithms through OpenMP and MPI



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INTRODUCTION

The target of our project is to find out which of these 3 (Serial vs OpenMP vs MPI) ways yields the most efficient outcome. In this, 2 sorting algorithms will be compiled using the above-mentioned ways of processing to find out the time complexity.

PROCEDURE

1. 3 sorting algorithms were be compiled:
 - a. Closest Point
 - b. Gharam Scan
2. Algorithms used the following ways of processing
 - a. Serial
 - b. Openmp
 - c. MPI
3. The timestamp was put on all these methods and reading was noted.
4. The program outputs the execution time of the way of processing used and also with how many elements it was used with

Closest Pair Points

```
ishmahafeez@21k4688: ~/Desktop
Dataset size: 10
Serial result: 5.099947
OpenMP result: 5.099947
Serial time: 0.002289 seconds
OpenMP time: 0.000003 seconds

Dataset size: 100
Serial result: 0.275257
OpenMP result: 0.275257
Serial time: 0.009540 seconds
OpenMP time: 0.000157 seconds

Dataset size: 1000
Serial result: 0.026485
OpenMP result: 0.026485
Serial time: 0.140206 seconds
OpenMP time: 0.003995 seconds

Dataset size: 10000
Serial result: 0.016038
OpenMP result: 0.016038
Serial time: 1.159204 seconds
OpenMP time: 0.035023 seconds

Dataset size: 50000
Serial result: 0.005932
OpenMP result: 0.001766
Serial time: 5.301300 seconds
OpenMP time: 0.151708 seconds
ishmahafeez@21k4688:~/Desktop$

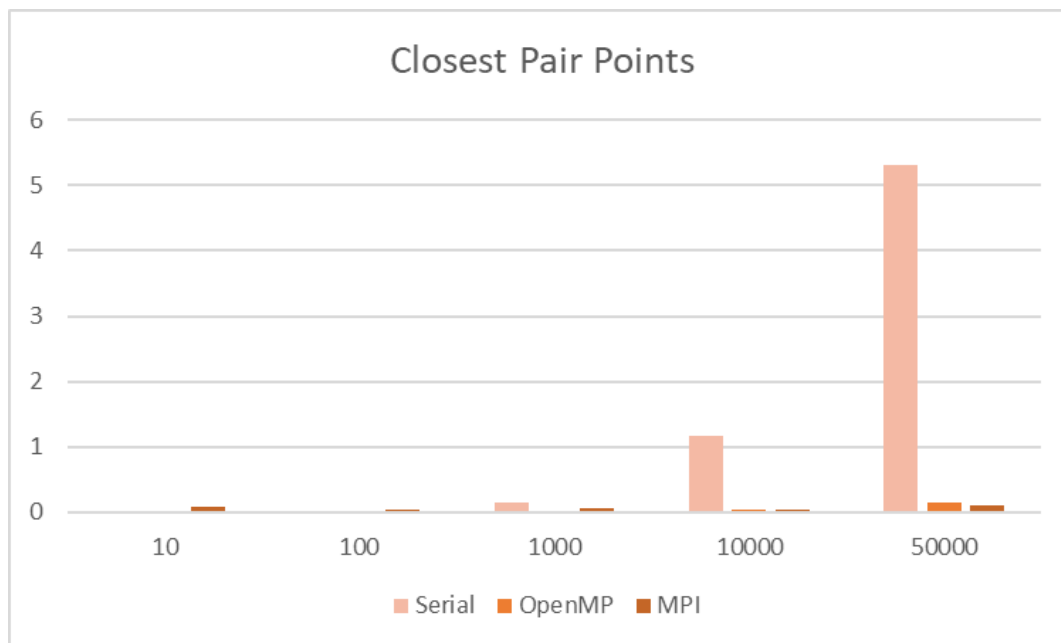
ishmahafeez@21k4688:~/Desktop$ mpicc -o c CPA-MPI.c -lm
ishmahafeez@21k4688:~/Desktop$ mpirun -np 8 ./c
Invalid MIT-MAGIC-COOKIE-1 keyInvalid MIT-MAGIC-COOKIE-1 keyInvalid M
IT-MAGIC-COOKIE-1 keyInvalid MIT-MAGIC-COOKIE-1 keyInvalid MIT-MAGIC-
COOKIE-1 keyInvalid MIT-MAGIC-COOKIE-1 keyInvalid MIT-MAGIC-COOKIE-1
keyInvalid MIT-MAGIC-COOKIE-1 keyInvalid MIT-MAGIC-COOKIE-1 keyInvali
d MIT-MAGIC-COOKIE-1 keyInvalid MIT-MAGIC-COOKIE-1 keyInvalid MIT-MAG
IC-COOKIE-1 keyInvalid MIT-MAGIC-COOKIE-1 keyInvalid MIT-MAGIC-COOKIE
-1 keyInvalid MIT-MAGIC-COOKIE-1 keyInvalid MIT-MAGIC-COOKIE-1 key
Dataset Size: 10
MPI time: 0.094504 seconds

Dataset Size: 100
MPI time: 0.040516 seconds

Dataset Size: 1000
MPI time: 0.071835 seconds

Dataset Size: 10000
MPI time: 0.040205 seconds

Dataset Size: 50000
MPI time: 0.096086 seconds
ishmahafeez@21k4688:~/Desktop$
```



```
ishmahafeez@21k4688: ~/Desktop
ishmahafeez@21k4688:~/Desktop$ ./c
For n = 10:
Serial Time: 0.000003 seconds
OpenMP Time: 0.000657 seconds

For n = 100:
Serial Time: 0.000031 seconds
OpenMP Time: 0.002380 seconds

For n = 1000:
Serial Time: 0.000327 seconds
OpenMP Time: 0.000570 seconds

For n = 10000:
Serial Time: 0.003388 seconds
OpenMP Time: 0.001461 seconds

For n = 50000:
Serial Time: 0.016749 seconds
OpenMP Time: 0.008167 seconds

ishmahafeez@21k4688:~/Desktop$
```



3

