Prob1 report

Antoine DESRUET 50221600

Environment

Os	Pop!_OS 22.04 LTS x86
CPU	Intel i7-8665U (8) @ 1.900GHz
Memory	16Gb
GCC version	14.0.0
GNU Make version	4.3

Build

In the prob1 folder:

GNU Make

```
make
```

CLI

```
gcc -o a.out ./prob1.c -fopenmp
```

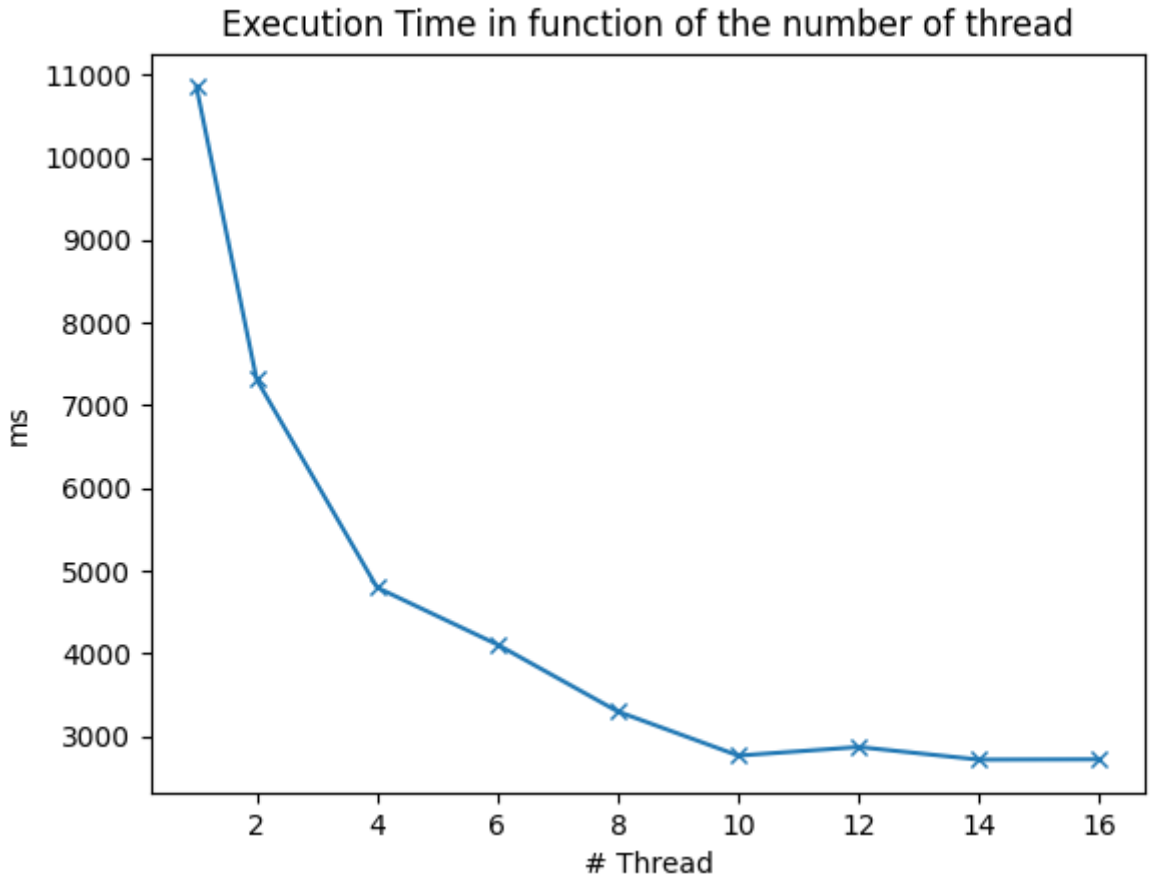
Static

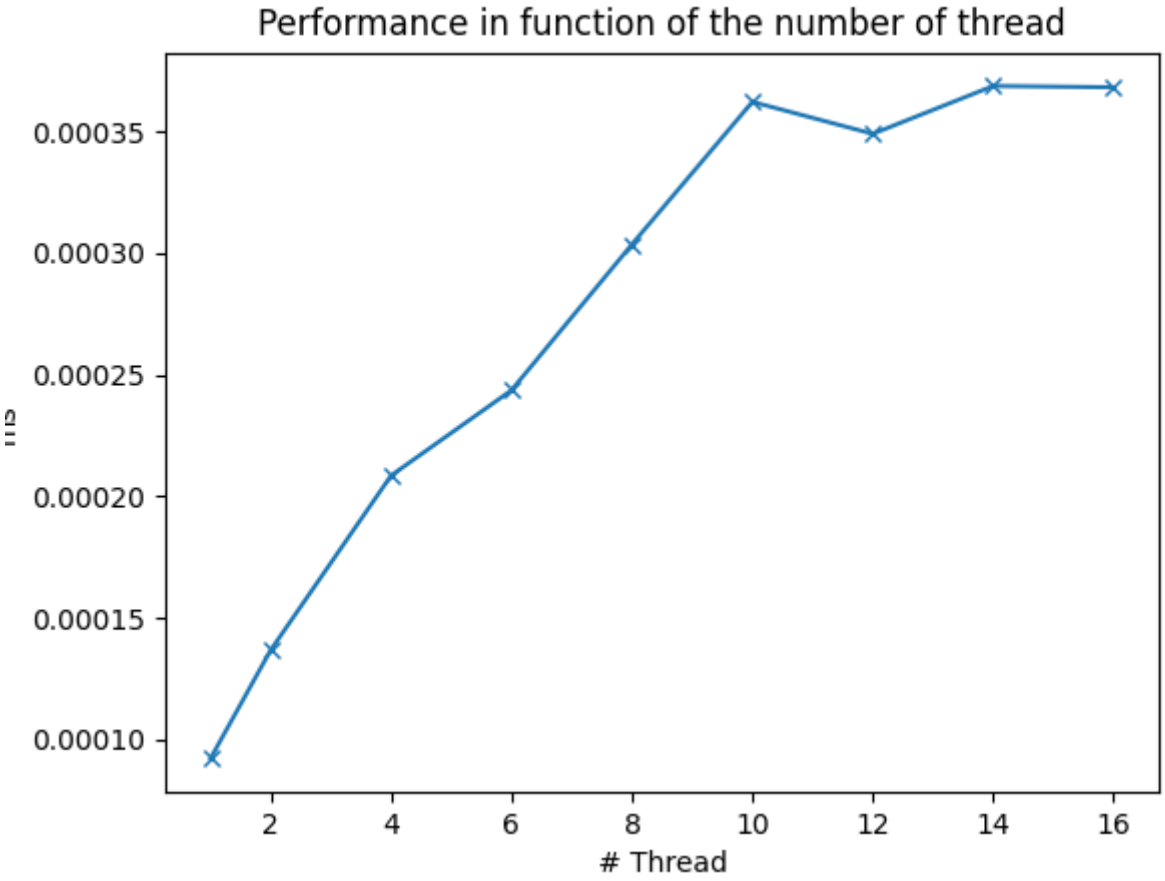
Tables

Number of thread	Execution time	Performance
1	10856	9.211495946941784e-05
2	7315	0.0001367053998632946
4	4796	0.0002085070892410342
6	4105	0.00024360535931790 5
8	3294	0.00030358227079538557
10	2761	0.0003621876131836291
12	2865	0.00034904013961605586

Number of thread	Execution time	Performance
14	2712	0.0003687315634218289
16	2716	0.0003681885125184094

Graphs



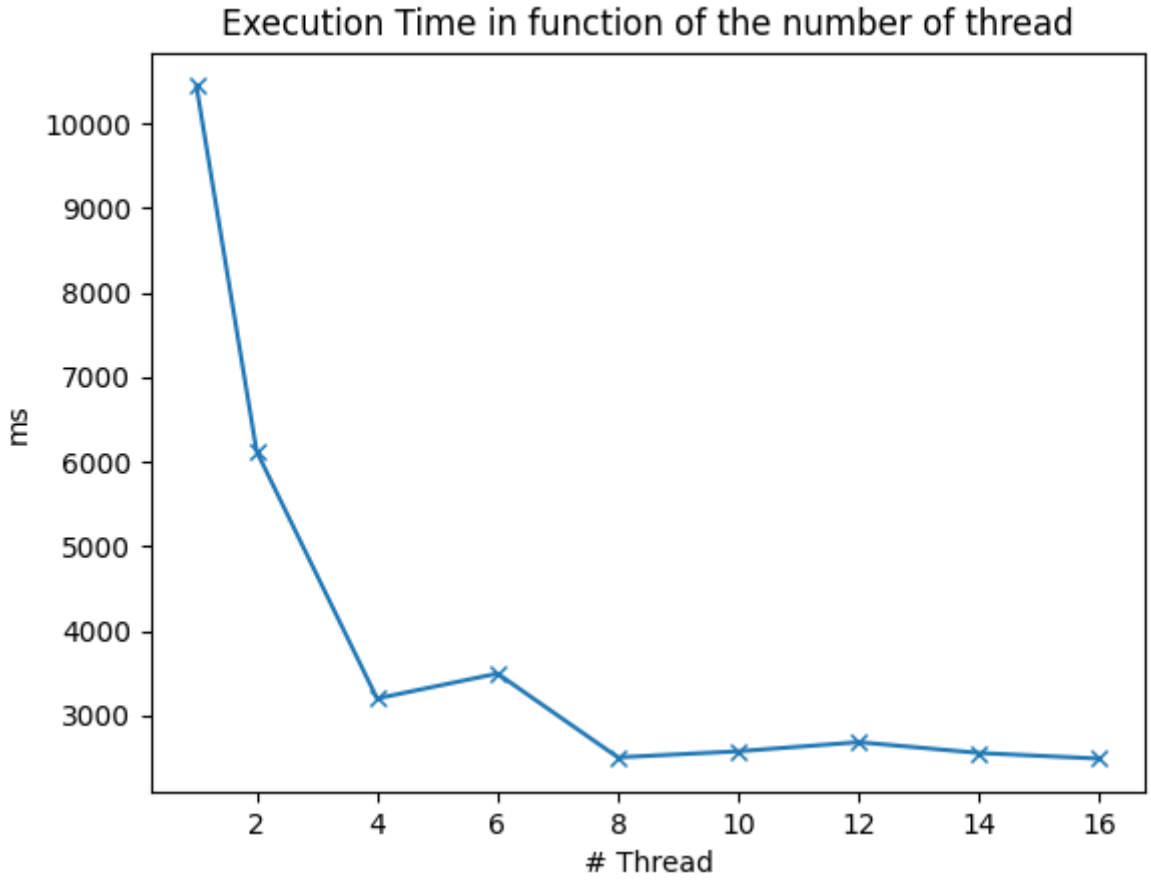


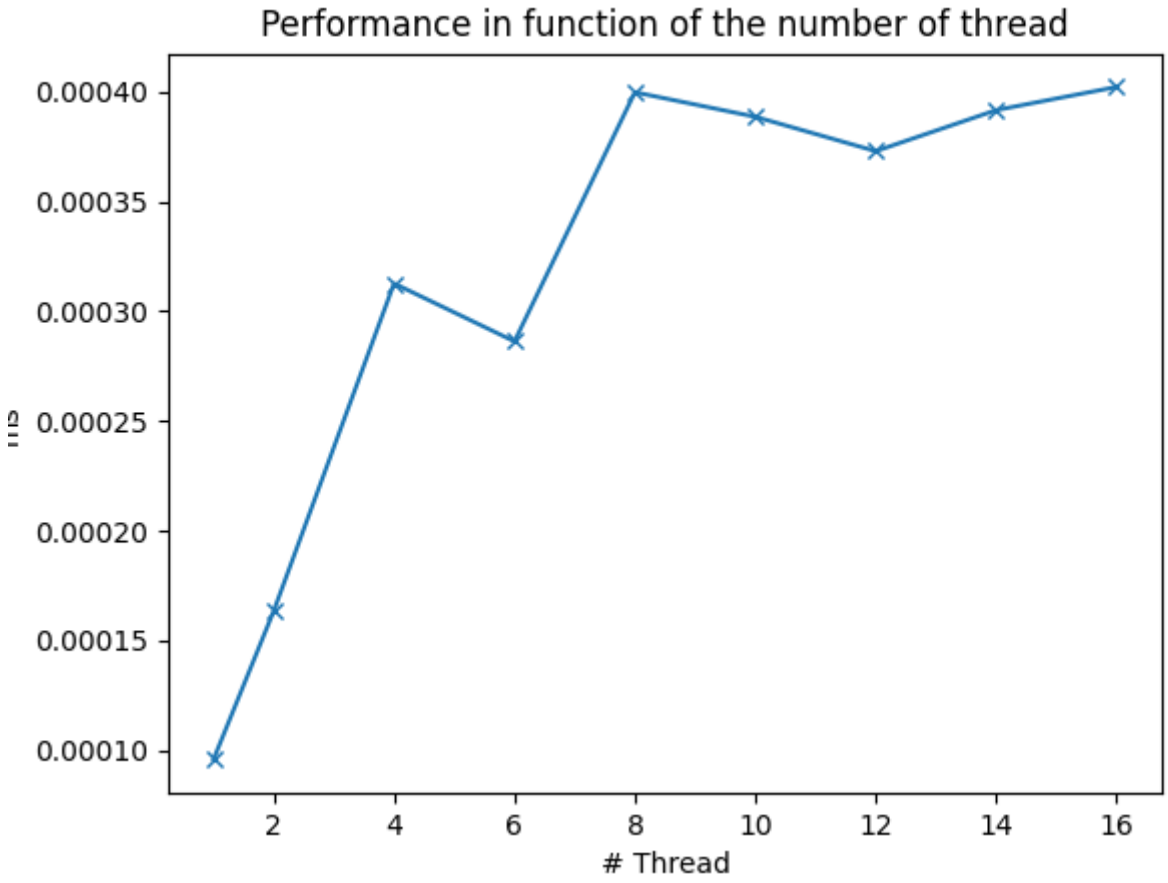
Static with 10 chunks

Tables

Number of thread	Execution time	Performance
1	10447	9.572125969177755e-05
2	6123	0.00016331863465621427
4	3199	0.00031259768677711783
6	3494	0.00028620492272467084
8	2502	0.0003996802557953637
10	2574	0.0003885003885003885
12	2682	0.0003728560775540641
14	2554	0.00039154267815191856
16	2487	0.0004020908725371934

Graphs


Execution Time in function of the number of thread
ms
10000
9000
8000
7000
6000
5000
4000
3000
2
4
6
8
10
12
14
16
Thread

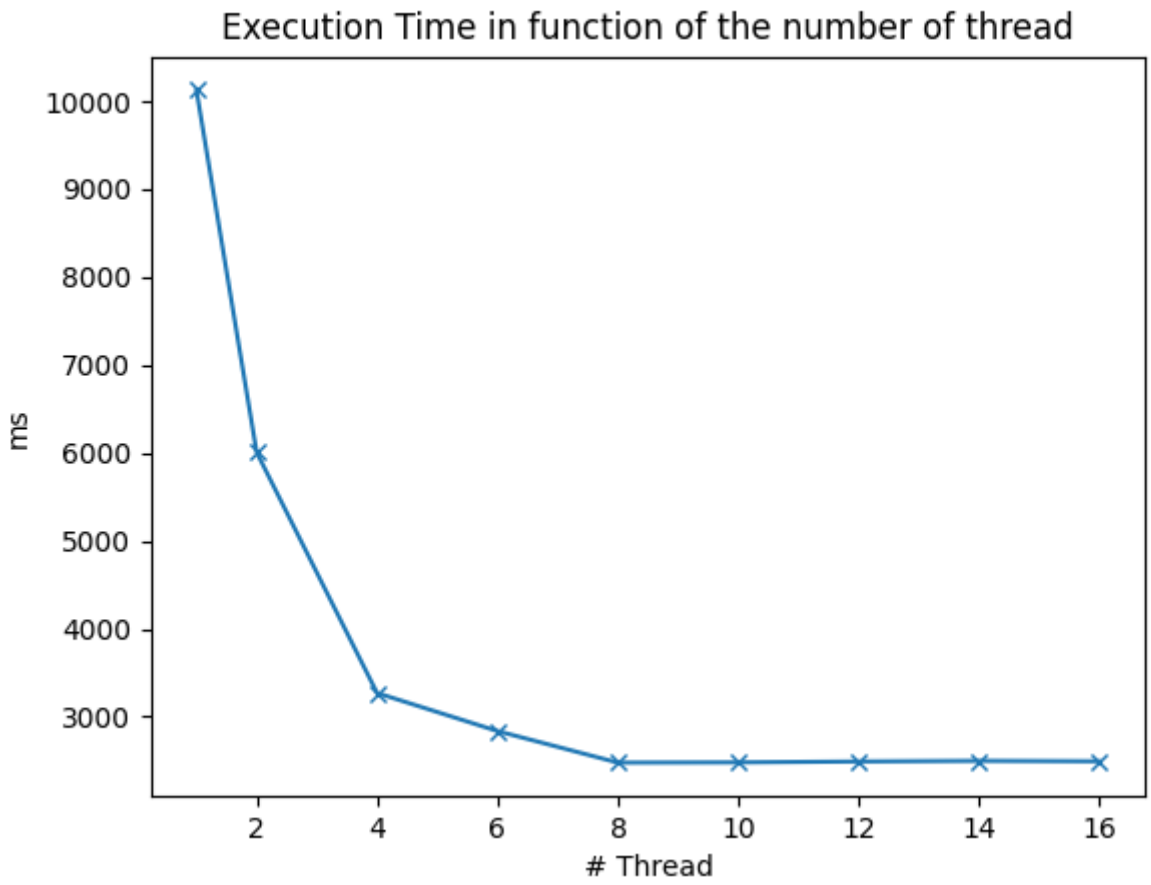

Performance in function of the number of thread
0.00040
0.00035
0.00030
0.00025
0.00020
0.00015
0.00010
2
4
6
8
10
12
14
16
Thread

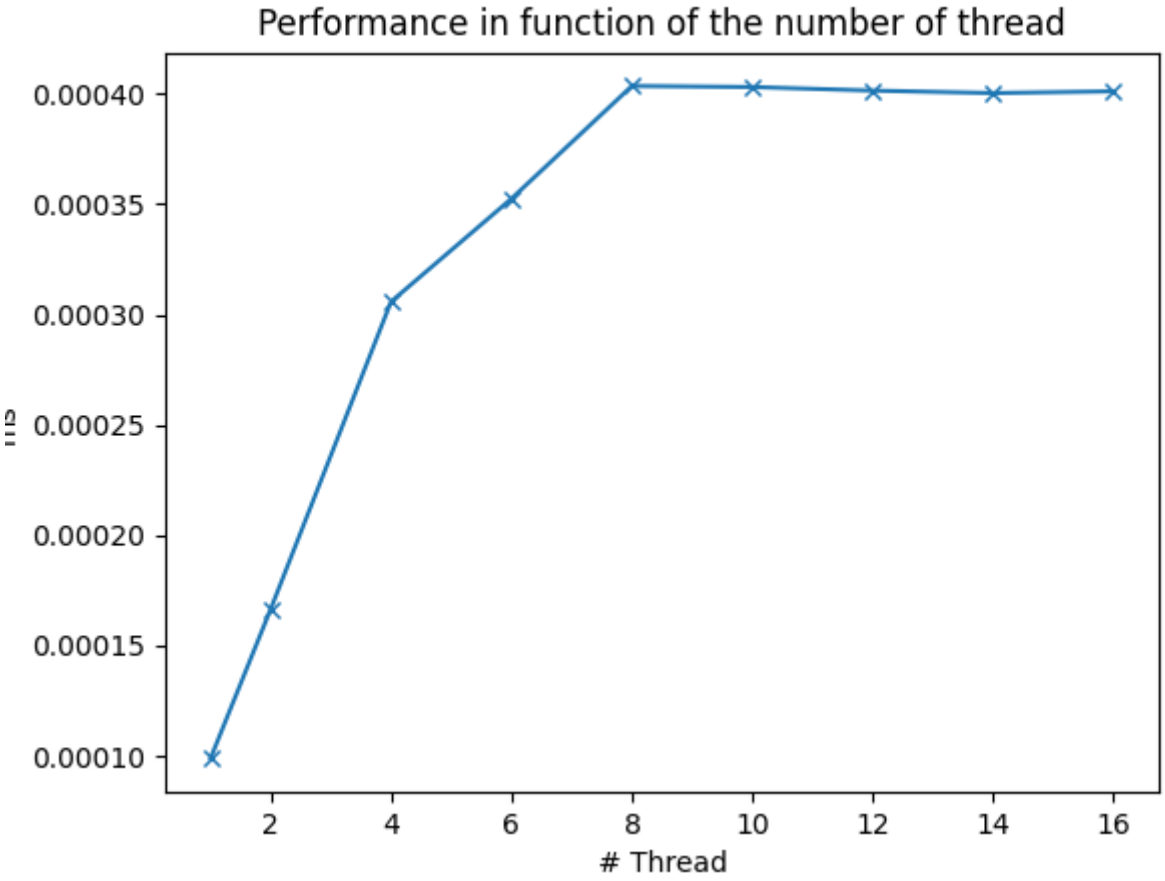
Dynamic

Tables

Number of thread	Execution time	Performance
1	10128	9.873617693522907e-05
2	6008	0.00016644474034620507
4	3270	0.0003058103975535168
6	2837	0.00035248501938667606
8	2478	0.0004035512510088781
10	2481	0.00040306328093510683
12	2491	0.0004014452027298274
14	2498	0.00040032025620496394
16	2493	0.00040112314480545525

Graphs



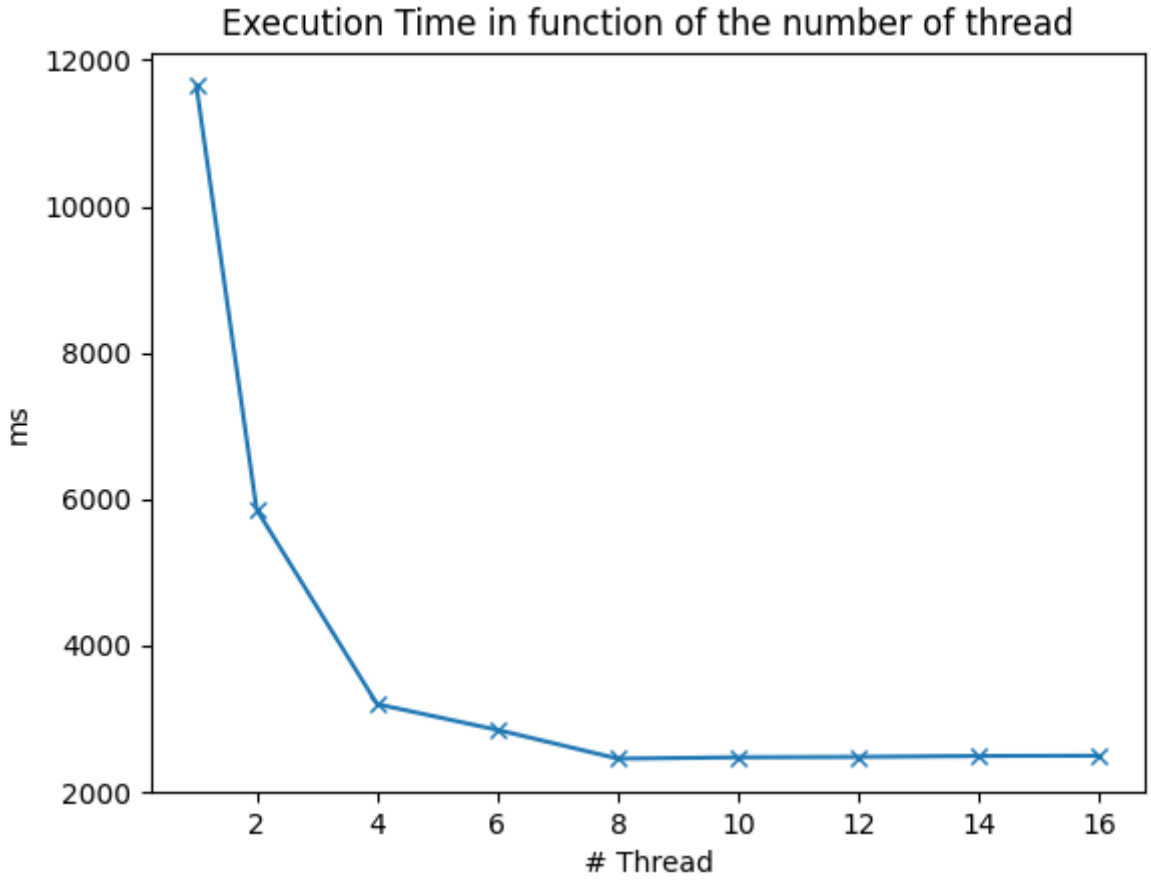


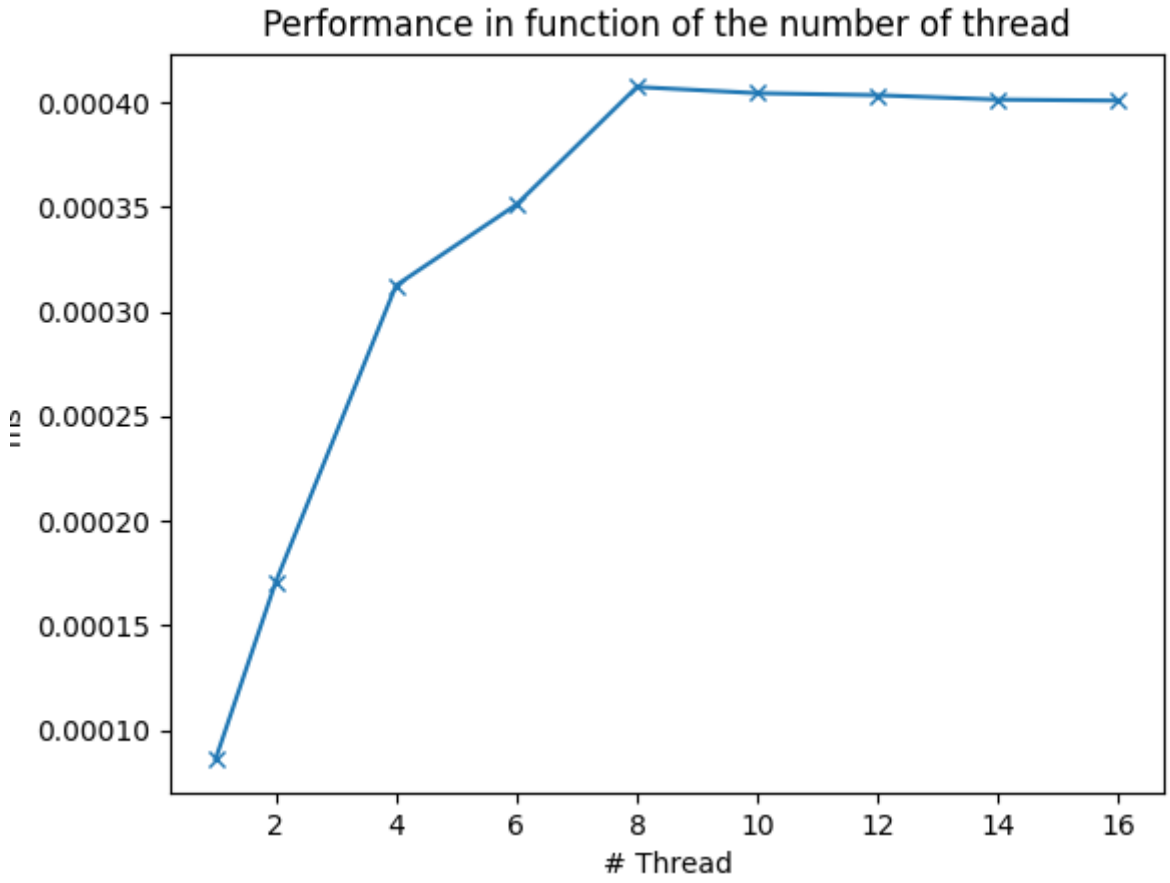
Dynamic with 10 chunks

Tables

Number of thread	Execution time	Performance
1	11645	8.587376556462001e-05
2	5859	0.00017067759003242875
4	3200	0.0003125
6	2848	0.00035112359550561797
8	2455	0.0004073319755600815
10	2473	0.0004043671653861706
12	2479	0.0004033884630899556
14	2492	0.0004012841091492777
16	2495	0.0004008016032064128

Graphs





Explanation

We can see that the dynamic scheduling is the most performant. This is because it takes long time to compute big prime numbers.

In the case of the static scheduling, the first thread will compute small numbers and the last one will compute big numbers. So the first thread will finish before the last one and will wait the end of the last one without doing any computation.

In the case of the dynamic scheduling, if a thread finish his task he will start a new one until there is no more task. This is more efficient when we don't know how long it will take to process a task.