DS
Assignment 2
2020201088

Configuration of the system

- 6 +2(integrated-graphic) Gb Ram
- 100 Gb memory (Allocated to Ubuntu)
- 3 Gb Graphic Card
- Ryzen 5 3500h Processor

Observations

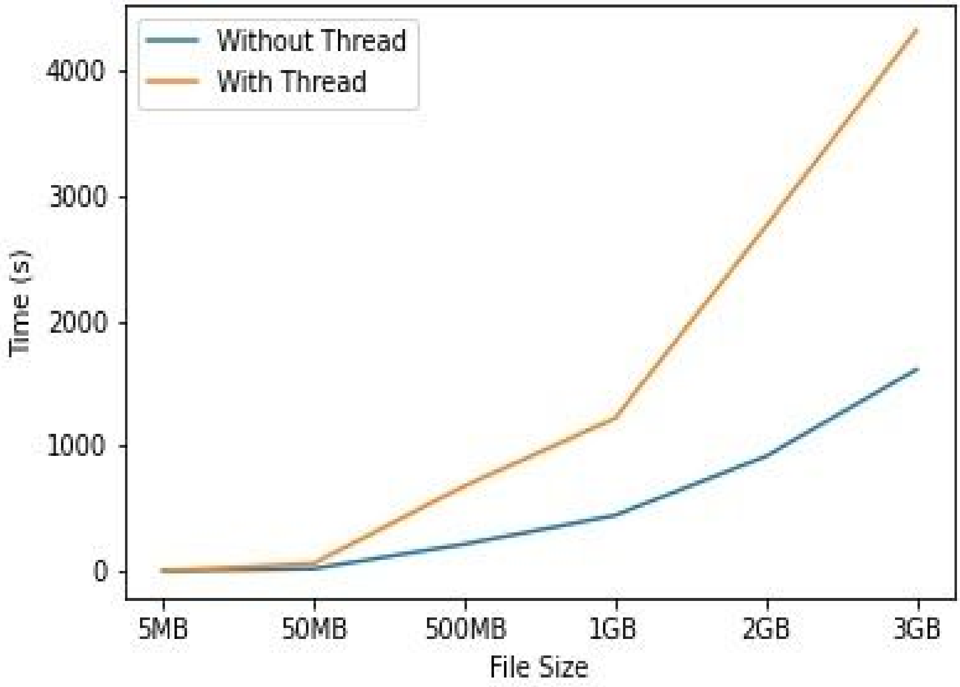
CASE -1

I have taken memory of 100MB and sorted the input.txt file on the Columns of C3 and C1

The observation table is :-

Time in sec File Size	Time for **without Threading** Algorithm	Time for **with Threading** Algorithm (Thread_count=10)
5Mb	2.045	2.58
50 Mb	21.339	61.934
500 Mb	215.661	679.89
1 Gb	446.054,	1221.079
2 Gb	917.396	2752.107
3 Gb	1610.4580	4318.2366

The Graph is :-

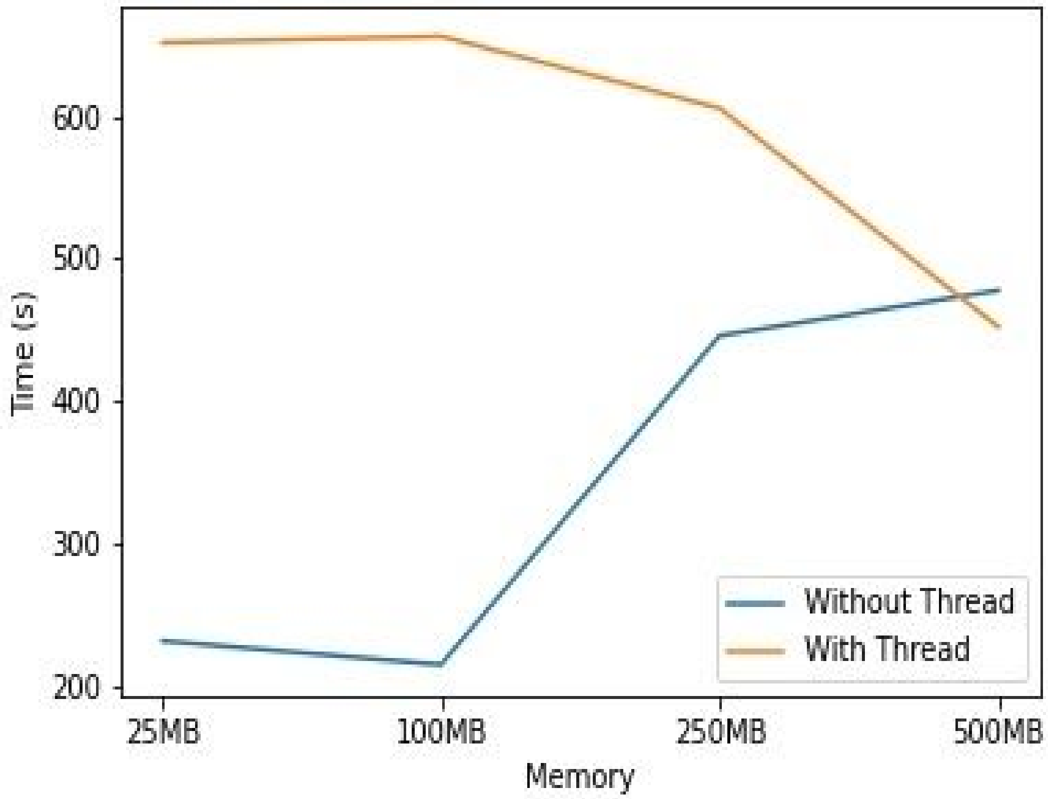


CASE 2 :-

I have fixed the file size with 500 Mb and now I will vary the memory size and will compare both the algorithms :-

Time in sec Memory Size	Time for **without Threading** Algorithm	Time for **with Threading** Algorithm (Thread_count=10)
25Mb	232.2774	651.586
100 Mb	215.660	656.0610
250 Mb	446.1941,	605.7245
500 Mb	477.9178	452.5013

The Graph is :-



Explanation

Case 1
In the first algorithm, as natural , when we increase the file size keeping the size of the memory same, we observe that the time keeps on increasing as more file size will give us more chunk and more of I/O operations due to which the time increases

In the Second Algorithm, I have experimented keeping the thread_count constant and memory size constant and on increasing the file size the time increases.

I have also observed that the time taken in the second algo is more, it is due to the reason that due to threads, there is more context switching and my system is only single processor therefore a lot of time is wasted in the context switching due to this more time is taken to sort the input files in the algo in which multithreading is used as compared to the normal algo.

Case 2

In this case we are keeping the file size same and keep varying the memory, so in this we can also observe the same as in threading more time will be required than the without threading case.

It is happening due to the same reason as there is an additional time i.e. the context switching time