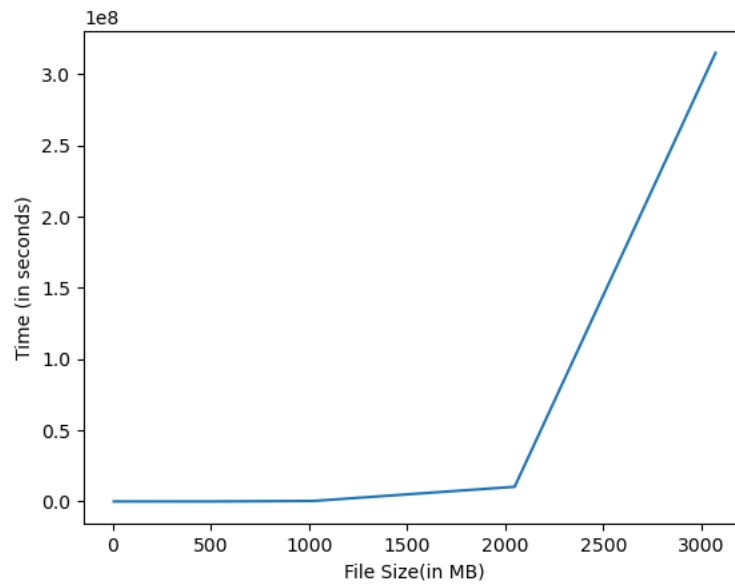# 1 Configuration

- Ubuntu 20.10

- Intel Core i5-4570TE Processor 2 x 2.7 GHz

- 4GB RAM

2 Observations

- Single Thread with Constant Memory
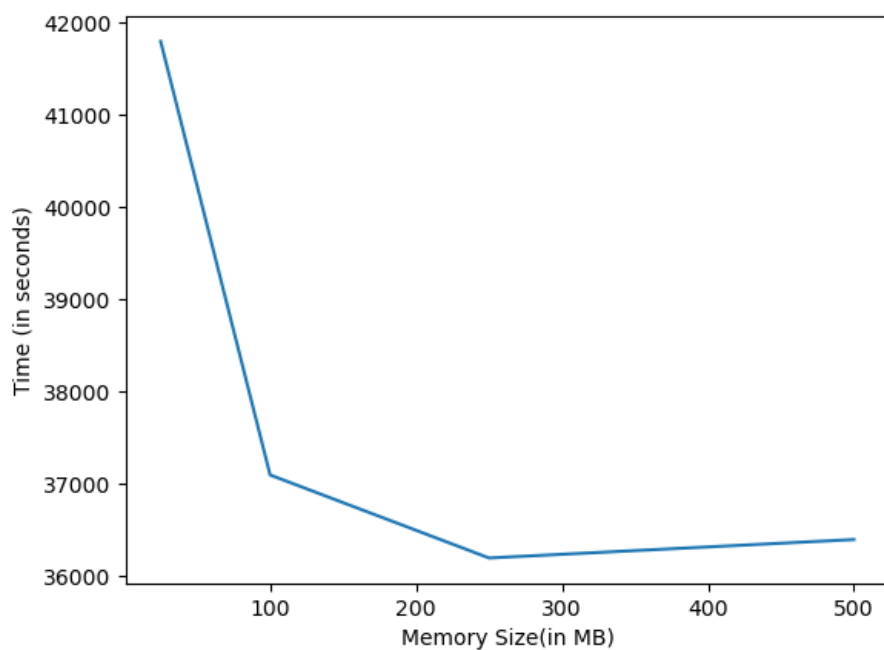
Input Size(in MB)	Time(in seconds)
5	9.9
50	342
500	11700
1024	$348 * 10^3$
2048	$103 * 10^5$
3072	$315 * 10^6$

The time taken to sort the file increases exponentially. This is because more and more intermediate files need to be managed. To conserve memory usage they are not open always but during reading only.

- Single Thread with Constant File Size

Memory(in MB)	Time(in seconds)
25	41800
100	37100
250	36200
500	36400

The time taken to sort the file decreases with increasing memory. But after a limit it stops decreasing. With increasing memory, the machine could have more space to keep and move data around so it is allowed to be more flexible.