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a) Configuration of the system:

Processor: Intel(R) Core(TM) i5-8250U CPU @ 1.60GHz
Memory: 7.7 GB
Hard Disk: 2 TB
OS: Ubuntu 18.04.3 LTS

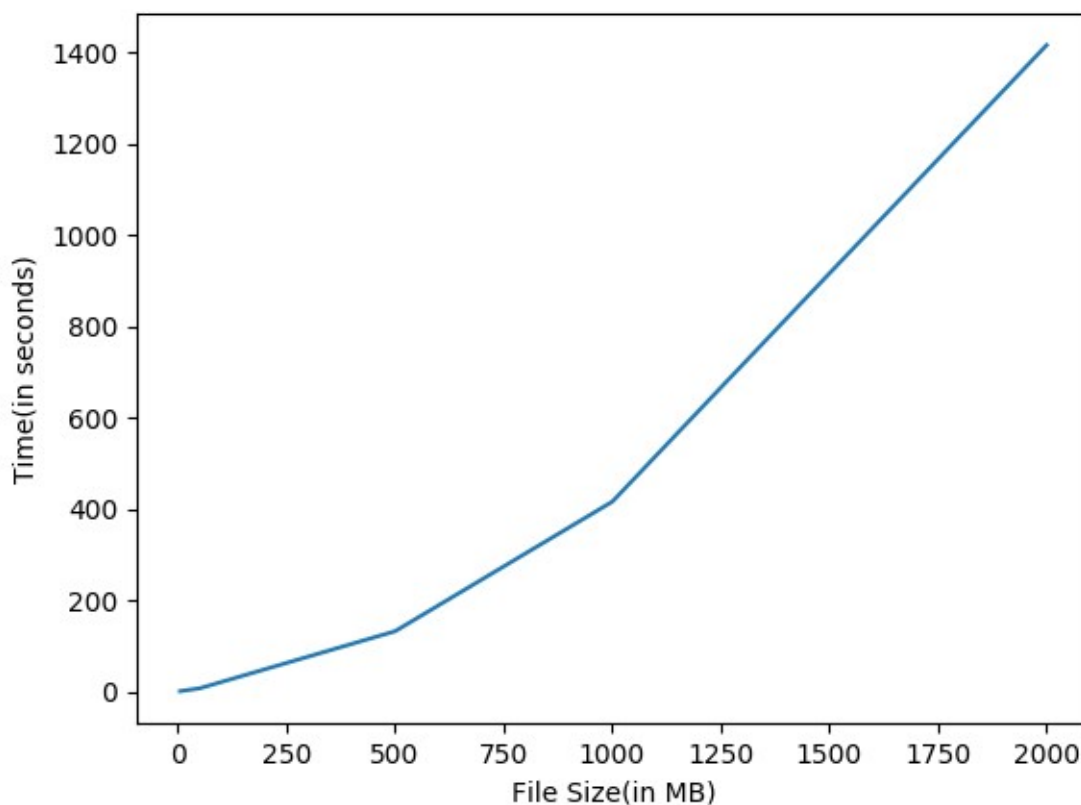
b) Observations

Varying FileSize with constant memory:

File size(in MB) vs Time(in seconds):

Fixed main memory:100MB

File Size(MB)	Time(seconds)
5	0.80
50	6.95
500	132.02
1000	415.80
2000	1465.96

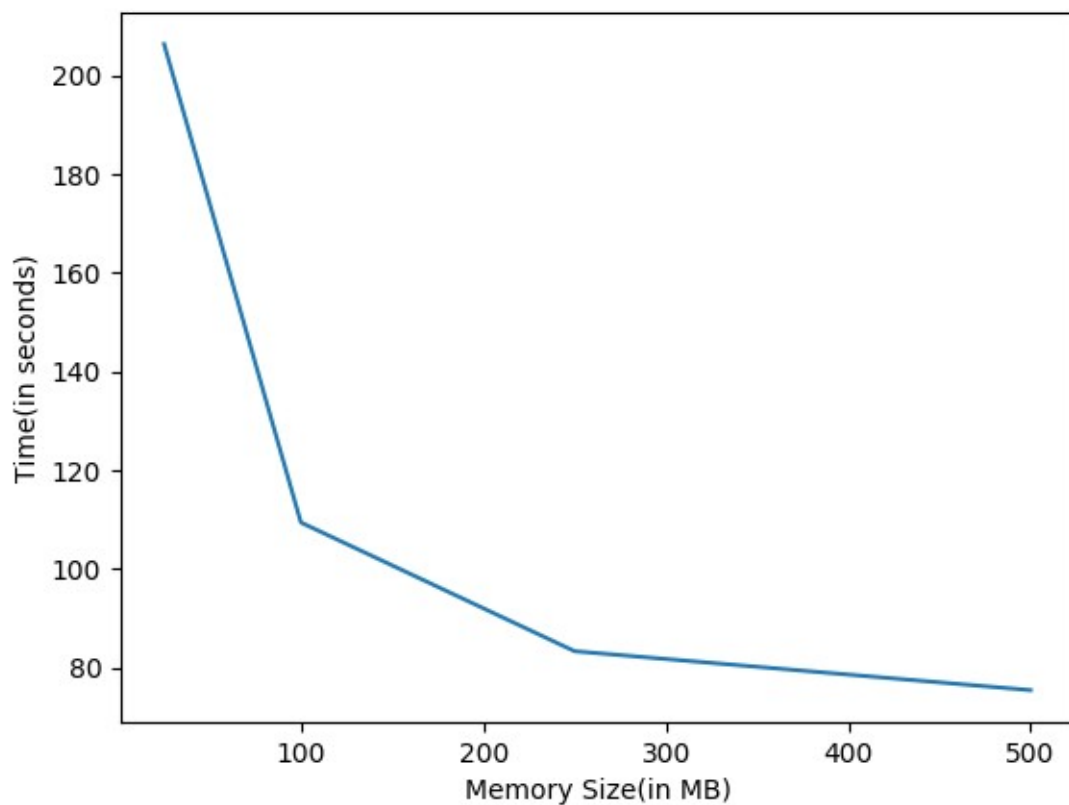


Varying Memory with constant FileSize:

Main memory(in MB) vs Time(in seconds):

Fixed file size:500MB

Main Memory(MB)	Time(seconds)
25	206.40
100	109.40
250	83.30
500	75.40



c) Explanation:

When file size is increased(keeping memory constant), execution time increases as more number of temporary files are created. We have to sort them all and then merge them.

On the other hand, as memory size increases, execution time decreases (provided file size is kept constant). This is because as main memory increases, no. of chunks decreases and sorting can be performed in-memory which is less time consuming.