

## Assignment2- Analysis:Part 1

### 1.Configuration of System:

Processor: Intel(R) Core(TM) i5-8250U CPU @ 1.60GHz

Memory: 7.7 GB

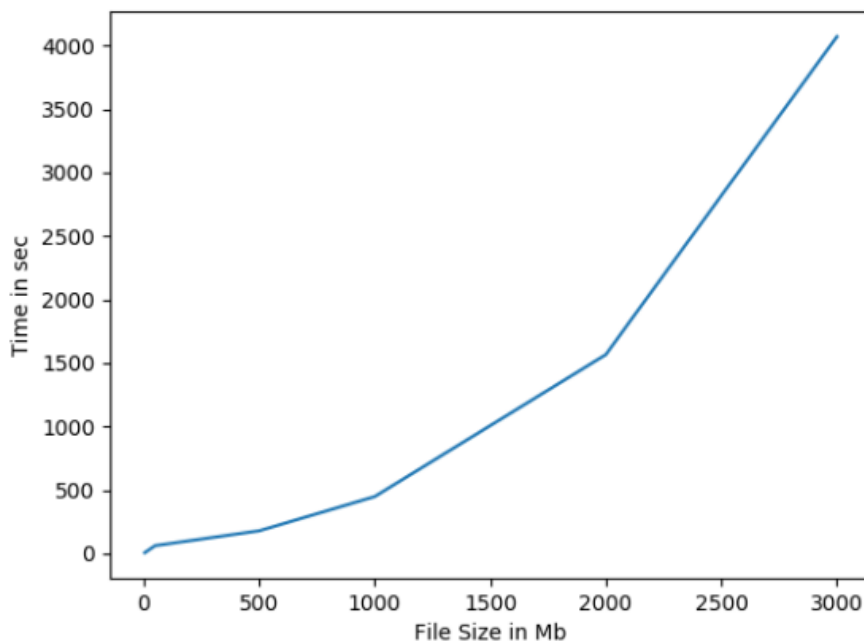
Hard Disk: 2 TB

OS: Ubuntu 18.04.3 LTS

### 2.Observations

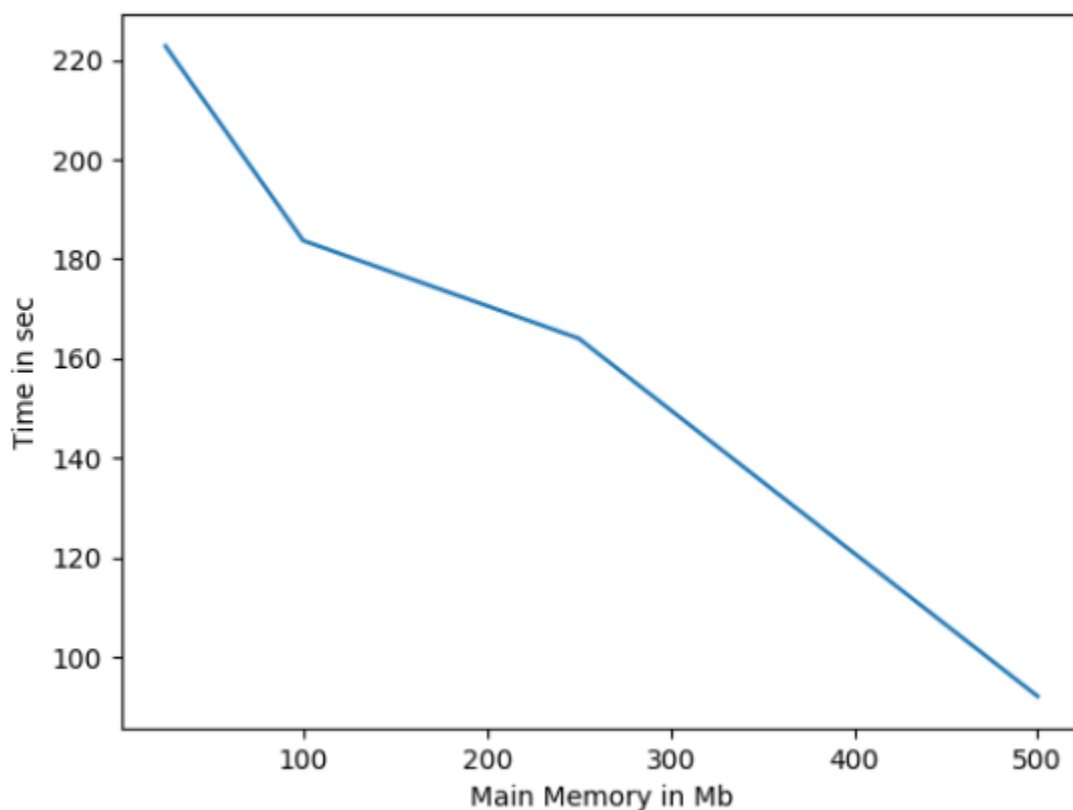
**a) Varying FileSize with constant memory:** Take the main memory as 100MB and run your two algorithms for file size 5MB, 50MB, 500MB, 1GB, 2GB, 3GB and note the time taken for each run.

| File Size in MB | Time in seconds   |
|-----------------|-------------------|
| 5               | 5.927458763122559 |
| 50              | 61.47411561012268 |
| 500             | 178.3786222934723 |
| 1000            | 447.7553653717041 |
| 2000            | 1565.96678        |
| 3000            | 4069.8973         |



**b) Varying memory with constant FileSize:** Take a file of size 500MB and run your two algorithms with memory as 25MB, 100MB, 250MB, 500MB and note the time taken at each run.

| Main Memory in MB | Time in seconds    |
|-------------------|--------------------|
| 25                | 222.795330286026   |
| 100               | 183.69971466064453 |
| 250               | 164.0607750415802  |
| 500               | 92.13879227638245  |



### 3. Explanation:

With the increase in file size (making the main memory fixed, here 100MB), execution time also increases as more number of files are created in the 1<sup>st</sup> phase. We have to sort them all and then merge them.

On the other hand,

With increase in memory size, execution time decreases (keeping the file size is as constant, here 500MB). This is because as main memory increases, no. of chunks decreases and sorting can be performed within the memory which is less time consuming.