

Assignment 12 - Virtual Memory Benchmark

Virtual Memory, Paging, and Swapping Explained:

Virtual memory allows programs to use more memory than physically available by swapping data between RAM and disk storage.

Paging is the process of moving fixed-size blocks (pages) of data between RAM and disk.

Swapping involves moving entire processes between RAM and disk to free up memory.

Benchmark Setup:

- Scenario I: 2GB file (fits in RAM, no paging)
- Scenario II: 24GB file (exceeds RAM, paging occurs)
- Monitored CPU, RAM, and Disk usage using Task Manager.

Observations:

2GB Test (No Paging):

- Memory: Usage increased to around 56-60%, well below total RAM capacity.
- CPU: Moderate activity (around 8-10%) due to memory operations.
- Disk: Very low usage (1-2%), no significant disk activity.

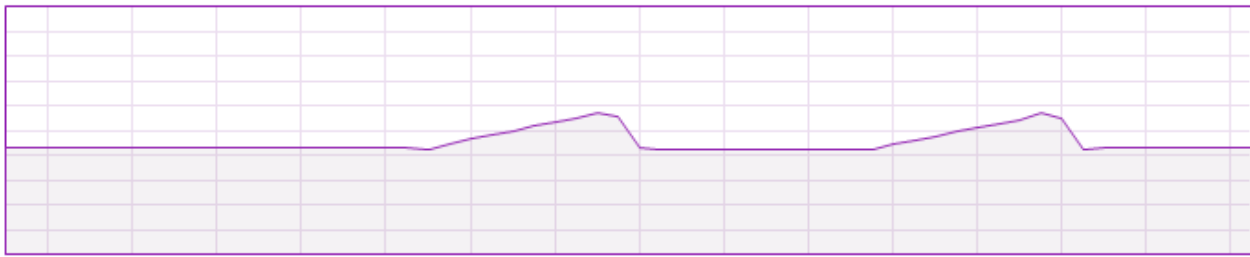
Conclusion: Data fits into RAM completely, very high read/write speeds, no paging.

Memory

16.0 GB

Memory usage

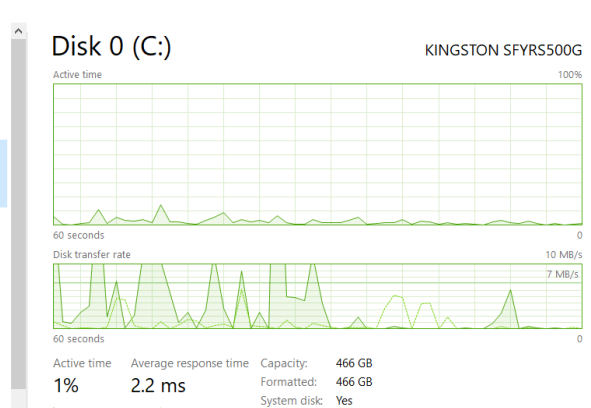
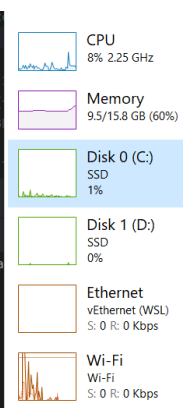
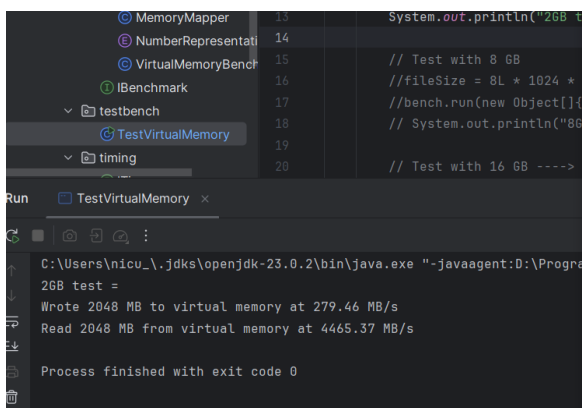
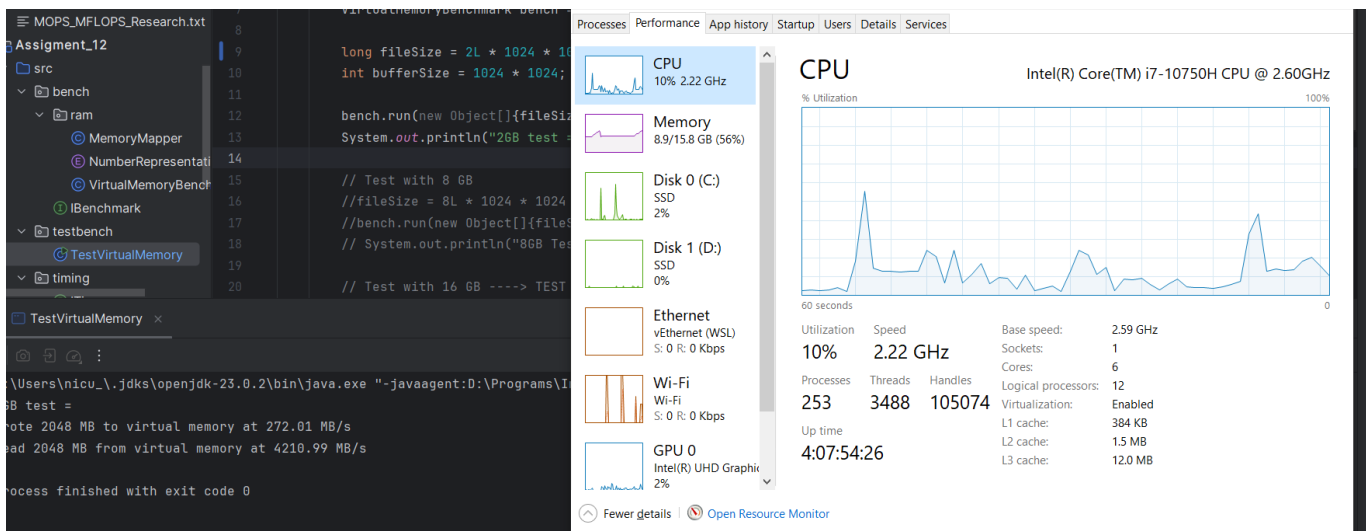
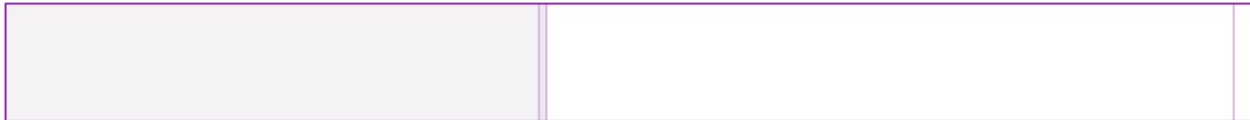
15.8 GB



60 seconds

0

Memory composition



24GB Test (With Paging):

- Memory: Usage reached 99 percent - full RAM capacity.
- CPU: Slight increase (around 12-17 percent) for memory management and swapping.

- Disk: High disk activity (up to 100 percent) as paging occurs heavily.

Conclusion: Data exceeds physical RAM, system uses disk for extra memory, leading to slower speeds due to paging.

