

1. What is the total amount of Physical Memory (KB) available on your system (In use + Available)?

8gb

2. Based on changes to the amount of Available memory, what is the apparent footprint (i.e., the full memory demand) of MS Edge with several web pages open?
Note: this activity is similar to observing process memory demand under Linux using 'vmstat' (but with lower resolution)

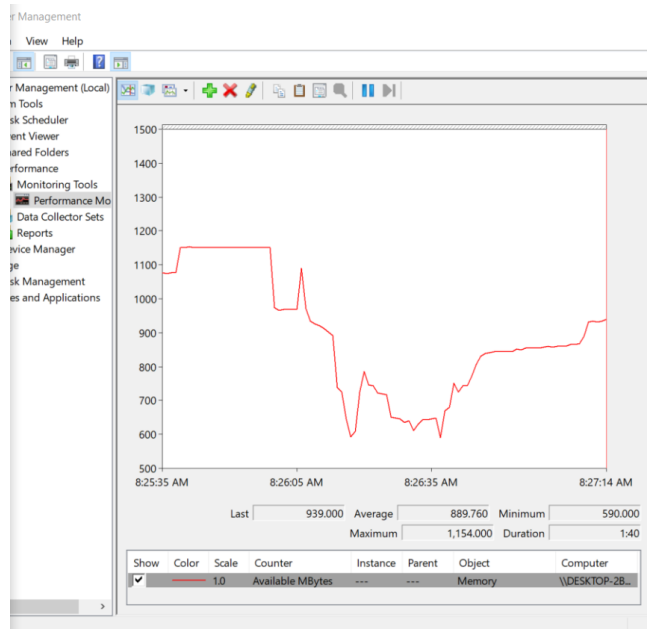
About 900mb

In use (Compressed)	Available	Speed:	2400 MHz
7.0 GB (113 MB)	864 MB	Slots used:	1 of 2
		Form factor:	SODIMM
		Hardware reserved:	184 MB
Committed	Cached		
12.1/22.8 GB	842 MB		
Paged pool	Non-paged pool		
651 MB	764 MB		

3. One of the measured components of available memory on Windows is the Standby list. What memory management mechanism described in your textbook does the Windows Standby list implement?

Caching

4. Note the changes in the reported amount of available memory as graphed in the display. Why is the apparent memory footprint of two instances of MS Edge not exactly twice the memory usage of a single instance?



Because of shared resources and cached memory, a second instance of MS Edge will not use exactly as much memory as the first instance.

5. What are the amounts of Total Physical Memory and Total Virtual Memory available on your system?

User Name	DESKTOP-2B8TP1M\fabia
Time Zone	Eastern Standard Time
Installed Physical Mem...	8.00 GB
Total Physical Memory	7.82 GB
Available Physical Mem...	616 MB
Total Virtual Memory	22.8 GB
Available Virtual Memory	9.91 GB
Page File Space	15.0 GB
Page File	C:\pagefile.sys

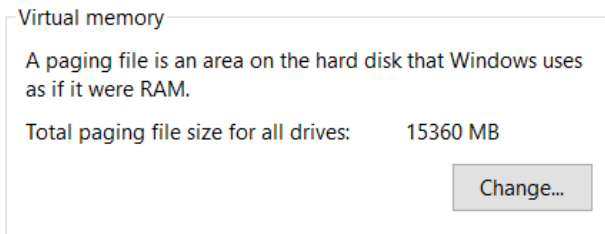
Total Physical Memory: 7.82 GB

Total Virtual Memory: 22.8 GB

o Explain the relationship between these two numbers and why Total Virtual Memory is bigger.

Physical Memory is the actual RAM hardware on the computer. Virtual memory is space that is allocated on the hard drive that the operating system uses as if it were additional RAM, and because hard drives generally have much more space than RAM virtual memory is able to be much bigger. Virtual memory is used with paging/swapping to free up space in physical memory if needed.

6. Under Virtual Memory, observe the size of the paging file



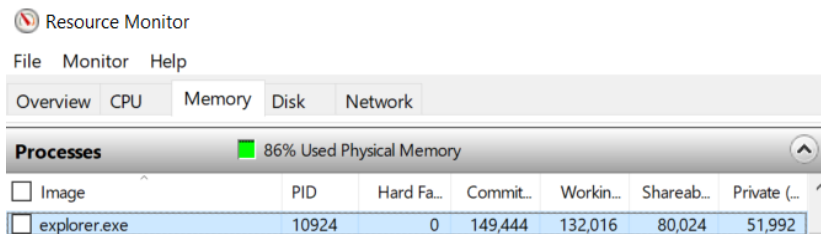
o how does this number correspond with the values observed in question 5?

It is the Total Virtual Memory minus the Total Physical Memory

o what is the purpose of the paging file in Windows (i.e. what Linux object has similar functionality)?

When the RAM is fully utilized, the Windows OS moves less frequently accessed data to the paging file to free up memory in the RAM in order to prevent system crashes resulting from insufficient memory. The Linux equivalent is the swap space.

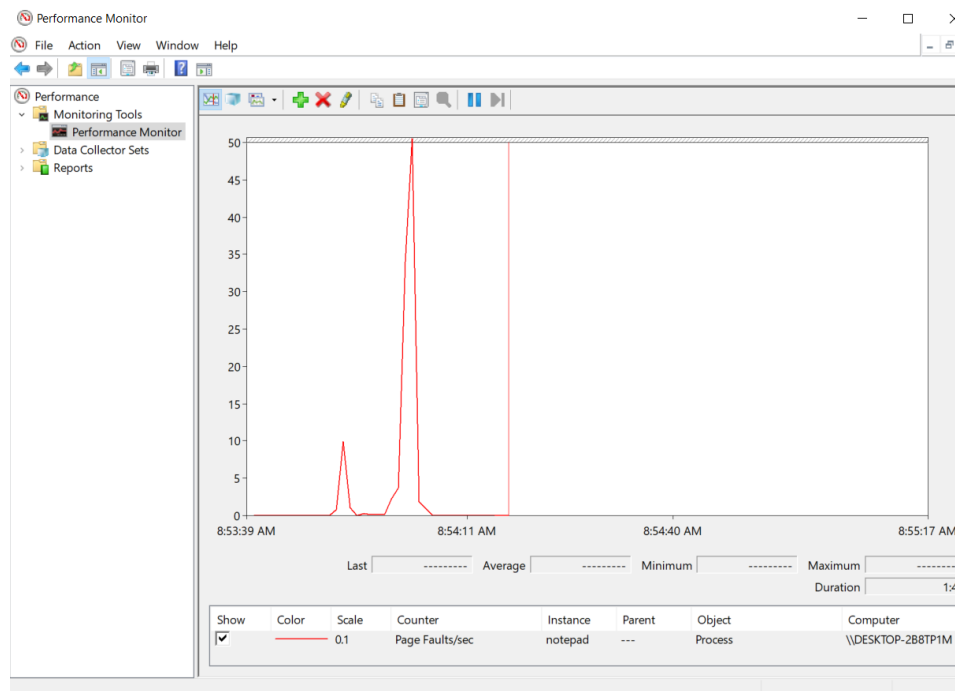
7. How much virtual memory is File Explorer (explorer.exe) using?



149,444 KB

8. Based on your understanding of the concepts discussed in class, what exactly is happening to produce the changes observed in the Performance graph?

Quantify your answer.



The graph is tracking Page Faults per second. Page Faults occur when a program needs to access data that is not currently in physical memory but instead in virtual memory. Typing in Notepad can result in page faults if the text file is not entirely in RAM. Similarly, when changing the font, the resources required to do so may not be in RAM. This results in page faults, as the data will first need to be swapped into the RAM from virtual memory. According to the graph, page faults are far more likely to occur when changing the font.

Mini-programming Assignment (Memory Management Functions)

```
(base) PS C:\GVSU\CIS 452> .\memoryManagementFunctions
Page Size: 4096 bytes
Memory State: Committed
Memory State: Free
(base) PS C:\GVSU\CIS 452> |
```