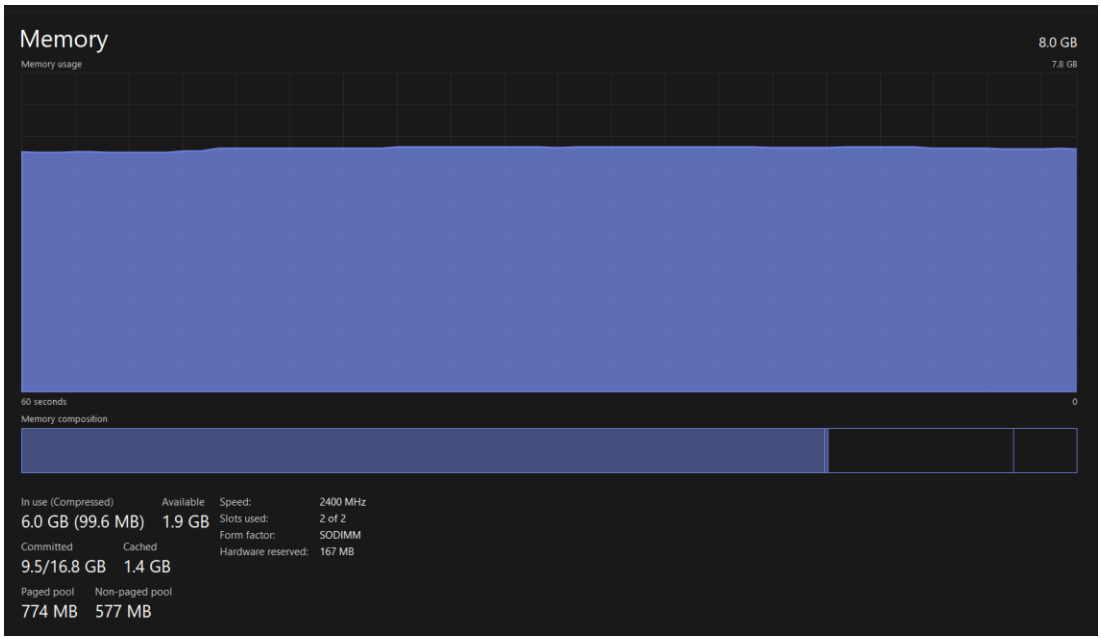
Part 1: Processes

1. (a) The Memory column in Task Manager gives an overview of the memory usage that is currently utilised by an application and the available storage that have not been used. This allows user to have a real-time view of the storage consumption and detect the memory-intensive tasks quickly.

Figure 1.1: Memory Usage when external programs are open

Figure 1.2: Memory Usage when no external programs are open



In Figure 1.1, the operating system is using 6.5GB of 7.8GB when there are running of several external programs. By comparing Figure 1.1 and 1.2, it is clearly shown that the memory in

use (RAM) when there are no external programs running is lower. In this case, the difference between the two is 0.6GB.

(b) The CPU usage column in task manager shows the CPU usage for each running process and application on a computer. It is useful for user to access and optimise system performance when there is a high CPU usage that may slow down the computer.

Figure 1.3: CPU Usage when external programs are open

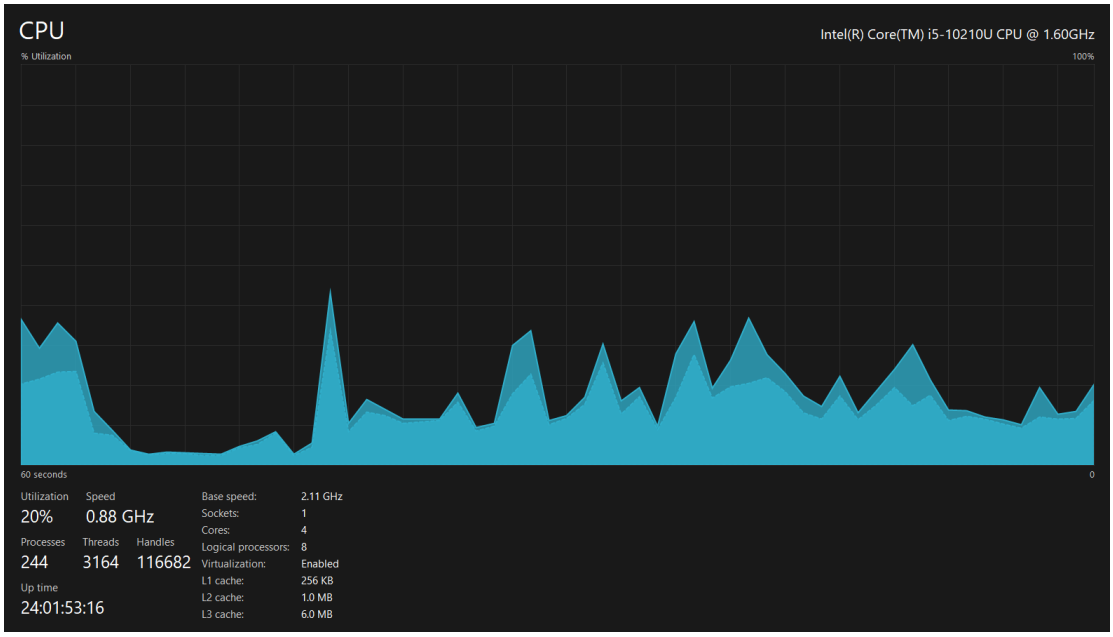
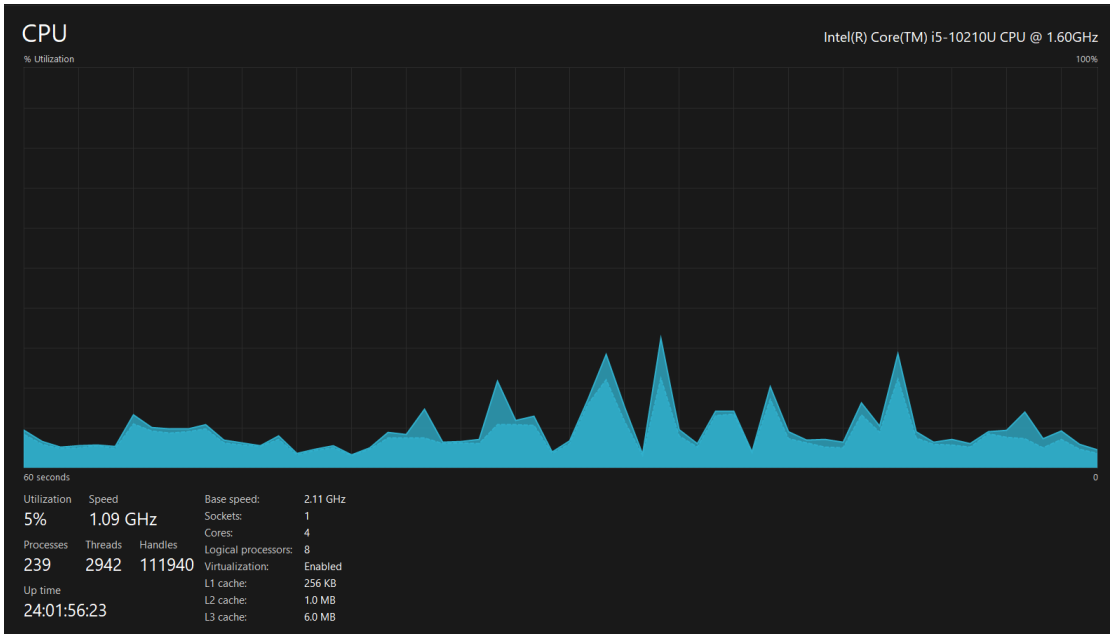
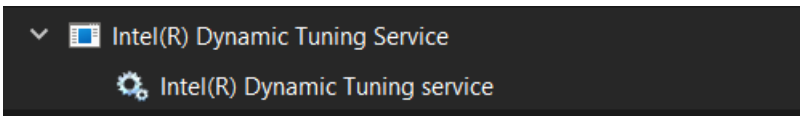


Figure 1.4: CPU Usage when no external programs are open



By comparing Figure 1.3 and 1.4, it is clearly shown that the CPU usage has decreased 15% and the speed increased by 0.21GHz. In Figure 1.3 where there are external programs running, the kernel time increases so that the computer is able to access the Input/Output devices such as microphones and speakers.

2.



I've came across the Intel(R) Dynamic Tuning Service which is a background process that I'm not familiar with when reviewing the task manager. It is designed to optimise the performance and power efficiency of Intel processors in laptops (Intel,2022). This is the technology introduced by Intel which mainly provides thermal management and adaptive performance service to the computer. With this, it improves CPU and GPU performance to enhance the user experience. Besides, it also ensures CPU operates at the most-efficient settings while meeting the performance demands of the running tasks. Moreover, this can also ensure that the system software remains current and compatible with other system modules such as BIOS and software to maintain overall system health.

For instance, Intel(R) Dynamic Tuning Service may alter the CPU's clock speed when the system is running a CPU intensive application such as video editing program, so that it minimises power consumption and reduce heat generation. From this, it protects the computer for a longer lifespan. Therefore, Intel(R) Dynamic Tuning Service is important as it contributes to reliability and productivity of the laptop.

3. An Operating System (OS) plays a crucial role in resource management within a computer, act as an interface between application programs and hardware. It is important for the OS to handle the storage and organization of computer files to ensure efficiency and minimize data redundancy. When the OS takes charge of file management, it can optimise storage, preventing situations where identical files are stored in multiple locations, thus conserving storage space. Additionally, the OS's file management software enhances data security, reducing the risk of data loss or corruption (Gaurav, 2022). Furthermore, the file management functionality within the operating system facilitates input-output operations on files, enabling the reading, writing, and extraction of data from these files.

Apart from that, OS also acts as a protective shield against malicious software. This allows OS to filter and remove undesired programs or malware before accessing to the computer's input and output devices, including microphones and webcams. This proactive measure ensures user privacy from being exposed to unauthorized access from external sources that could potentially compromise our personal data through these input/output devices.

References

Gaurav, S. (2022, October 11). *https://www.scaler.com/topics/file-management-in-operating-system/*. Scaler Topics. https://www.scaler.com/topics/file-management-in-operating-system/

Intel. (2022, April 21). *Intel® Dynamic Tuning Technology (Intel® DTT) User Guide*. Intel. https://www.intel.com/content/www/us/en/support/articles/000058479/graphics.html

Using Task Manager to monitor memory usage in Windows 10 | TechTarget. (n.d.). Enterprise Desktop. Retrieved September 3, 2023, from https://www.techtarget.com/searchenterprisedesktop/tip/Using-Task-Manager-to-monitor-memory-usage-in-Windows-10