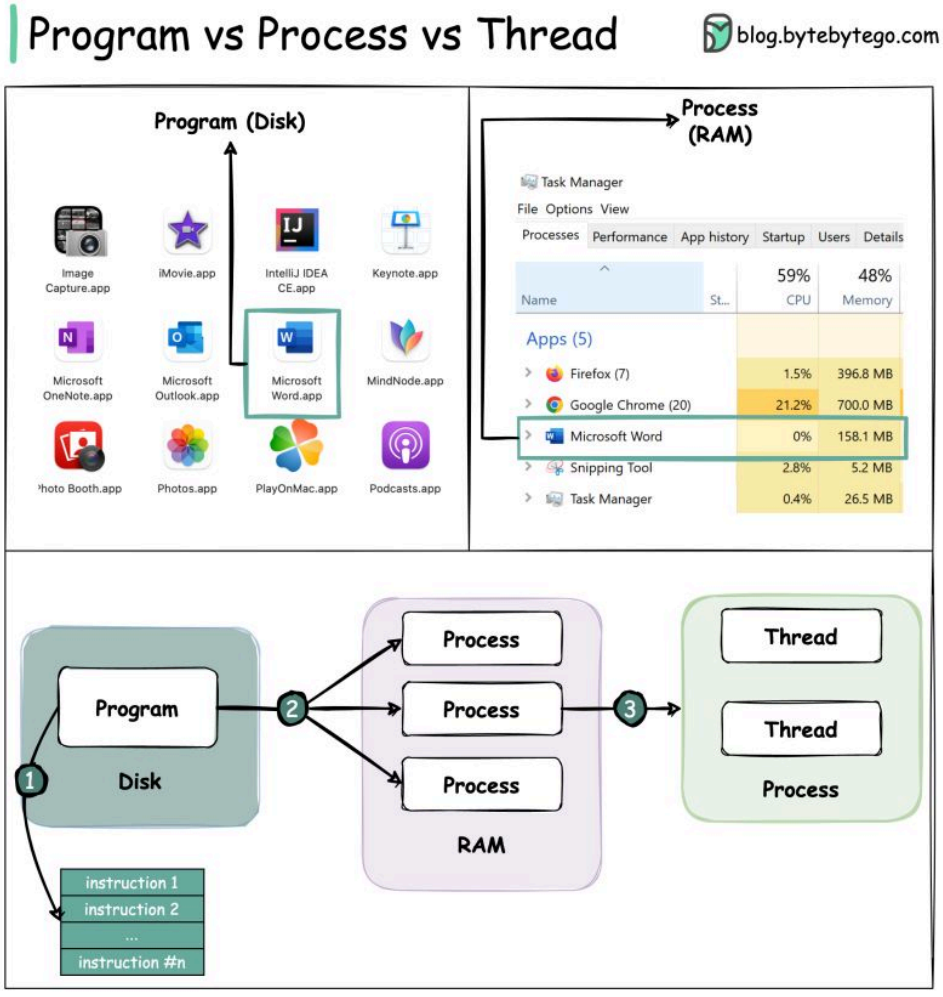
Popular interview question: What is the difference between Process and Thread?

To better understand this question, let's first take a look at what a Program is. A Program is an executable file containing a set of instructions and passively stored on disk. One program can have multiple processes. For example, the Chrome browser creates a different process for every single tab.

A Process means a program is in execution. When a program is loaded into the memory and becomes active, the program becomes a process. The process requires some essential resources such as registers, program counter, and stack.

A Thread is the smallest unit of execution within a process.



The following process explains the relationship between program, process, and thread.

1. The program contains a set of instructions.

2. The program is loaded into memory. It becomes one or more running processes.
3. When a process starts, it is assigned memory and resources. A process can have one or more threads. For example, in the Microsoft Word app, a thread might be responsible for spelling checking and the other thread for inserting text into the doc.

Main differences between process and thread:

- Processes are usually independent, while threads exist as subsets of a process.
- Each process has its own memory space. Threads that belong to the same process share the same memory.
- A process is a heavyweight operation. It takes more time to create and terminate.
- Context switching is more expensive between processes.
- Inter-thread communication is faster for threads.

Over to you:

1. Some programming languages support coroutine. What is the difference between coroutine and thread?
2. How to list running processes in Linux?