

COMPUTER HARDWARE- PROCESSOR, MEMORY (PRIMARY MEMORY)

1.PROCESSOR



- The CPU (Central Processing Unit), a complete computation engine that is fabricated on a single chip, is the computer's brain.
- It is sometimes referred to as the *central processor*, *microprocessor*, or just *processor*.
- Two typical components of a CPU are:
 - ❖ 1) the arithmetic logic unit (ALU), which performs arithmetic and logical operations,
 - ❖ and 2) the control unit, which extracts instructions from memory and decodes and executes them, calling on the ALU when necessary.

PROCESSOR

- Most newer PCs have *Pentium* processors. *Pentium* processors run faster than the numbered processors found in older computers (286, 386, 486 processors). The speed of processors, called the **clock speed**, is measured in **megahertz (MHz)** or **gigahertz (1 GHz = 1000 MHz)**
- The CPU of your computer is very much like your brain, it is the part of the computer that gives out all basic instructions to every other component on your computer.



PROCESSOR

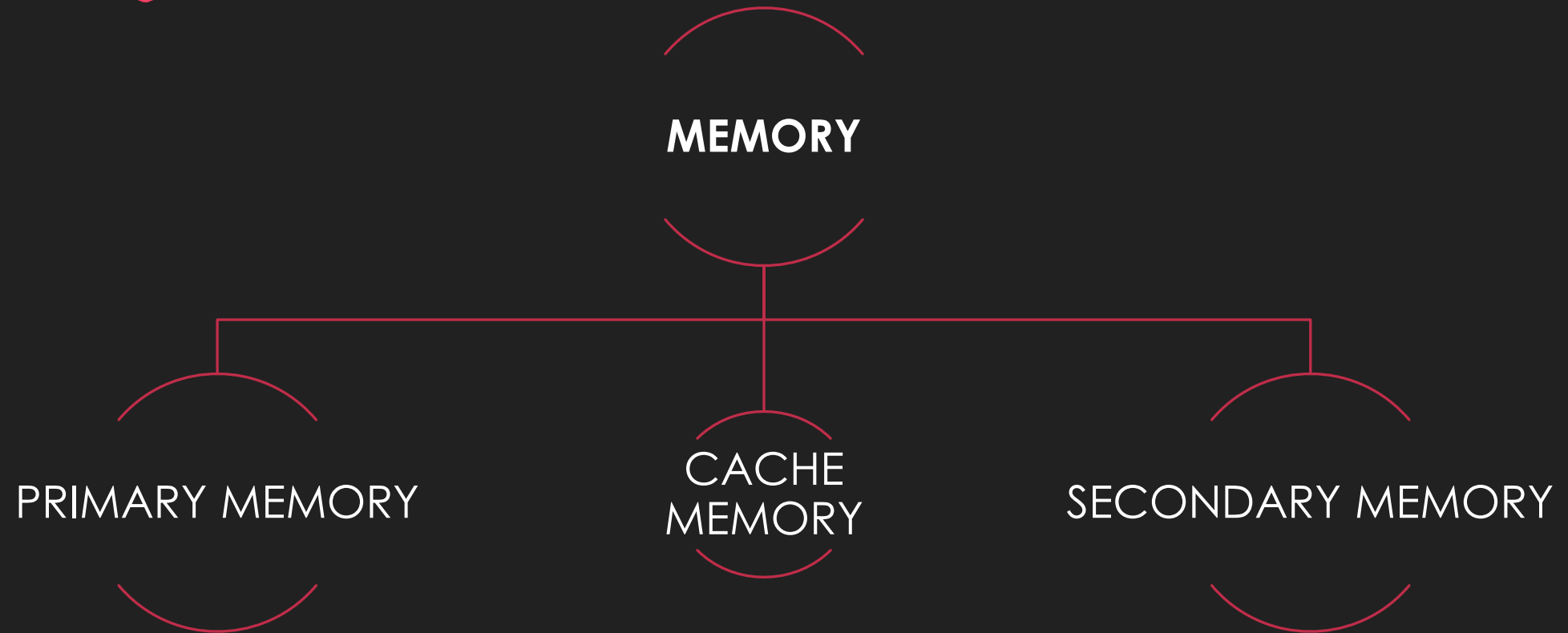
- The CPU is one of the main components that will effect the performance of your computer, generally a powerful CPU will let a computer perform tasks faster and can perform more intensive tasks on your computer as well.
- The two main brands of desktop CPU manufacturers are **AMD and Intel**, both of which have certain advantages and disadvantages in their hardware..



2.Memory

- A memory is just like a human brain. It is used to store data and instructions. Computer memory is the storage space in the computer, where data is to be processed and instructions required for processing are stored.
- Memory is primarily of three types –
 - Cache Memory
 - Primary Memory/Main Memory
 - Secondary Memory

Memory



Memory



○ 1.Cache Memory

- ✓ Cache memory is a very high speed semiconductor memory which can speed up the CPU.
- ✓ It acts as a buffer between the CPU and the main memory.
- ✓ It is used to hold those parts of data and program which are most frequently used by the CPU.
- ✓ The parts of data and programs are transferred from the disk to cache memory by the operating system, from where the CPU can access them.

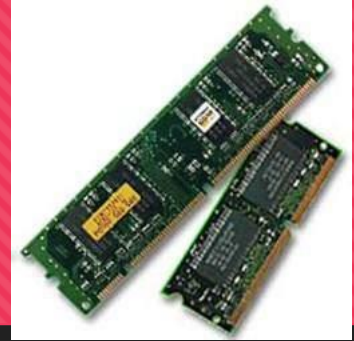
Advantages

- **The advantages of cache memory are as follows –**
 - Cache memory is faster than main memory.
 - It consumes less access time as compared to main memory.
 - It stores the program that can be executed within a short period of time.
 - It stores data for temporary use.

Disadvantages

- **The disadvantages of cache memory are as follows –**
 - Cache memory has limited capacity.
 - It is very expensive.

Primary Memory (Main Memory)



- Primary memory holds only those data and instructions on which the computer is currently working.
- It has a limited capacity and data is lost when power is switched off.
- It is generally made up of semiconductor device. These memories are not as fast as registers. The data and instruction required to be processed resides in the main memory.
- It is divided into two subcategories
 1. RAM
 2. ROM.

- **ROM (Read Only Memory)** is the computer's permanent, long-term memory.
- It doesn't disappear when the computer is shut off. It can not be erased or changed in anyway.
- However, there are types of ROM called PROM that can be altered. The P stands for programmable. ROM's purpose is to store the basic input/output system (BIOS) that controls the start-up, or boot process.

- **RAM (Random Access Memory)** is a working area where the operating system (e.g. *Windows*), programs and data in current use are kept, ready to be accessed by the processor.
- It is the best known form of computer memory.
- However, RAM, unlike ROM, is emptied when the computer is switched off. The more RAM you have, the quicker and more powerful your computer is.
- There are two basic types of RAM:
- **dynamic RAM (DRAM) and static RAM (SRAM).**
- The two types differ in the technology they use to hold data. DRAM, the more common type, needs to be refreshed thousands of times per second. SRAM does not need to be refreshed, which makes it faster, but it is also more expensive than DRAM

Characteristics of Main Memory

- These are semiconductor memories.
- It is known as the main memory.
- Usually volatile memory.
- Data is lost in case power is switched off.
- It is the working memory of the computer.
- Faster than secondary memories.
- A computer cannot run without the primary memory.