Introduction to Computer Hardware – Module 2

Computer System :

A computer system is a combination of Hardware and Software which on a whole processes the input data into some useful information.

Computer Hardware : It is the physical component of computer which we could touch and feel. Eg: Monitor, CPU(Central Processing Unit), Mouse, Keyboard, etc. A computer hardware could be an input or an output device, depending upon whether the data is fed into the computer or the output is simple obatined from the computer after the data has under gone some processes to yield information.

However, we have discussed about the difference between data and information in the “Introduction To Computer- Module 1”, we will once again to a quick rundown to the basics.

Data : When we give instruction to the computer or provide the computer with some input, it is called data. It is raw and has not gone under any process.

Information : Once when the data is entered in the computer, the computer performs some prcesses and calculations on the data, to yield an information. Informations are not raw and have undergone some processes and calculations.

Ex : Consider, that you as a computer enthusiast entered two numbers, 3 and 5 in the calculator of the computer to perform simple addition, as a result the computer comes up with the sum f the two numbers, i.e. 8. Here, the 3 and 5 are the data, as it is raw and unprocessed. But, contrary to data, the output i.e. 8 is a result of addition calculation which makes it information.

Now, let us get back to the input and output devices.

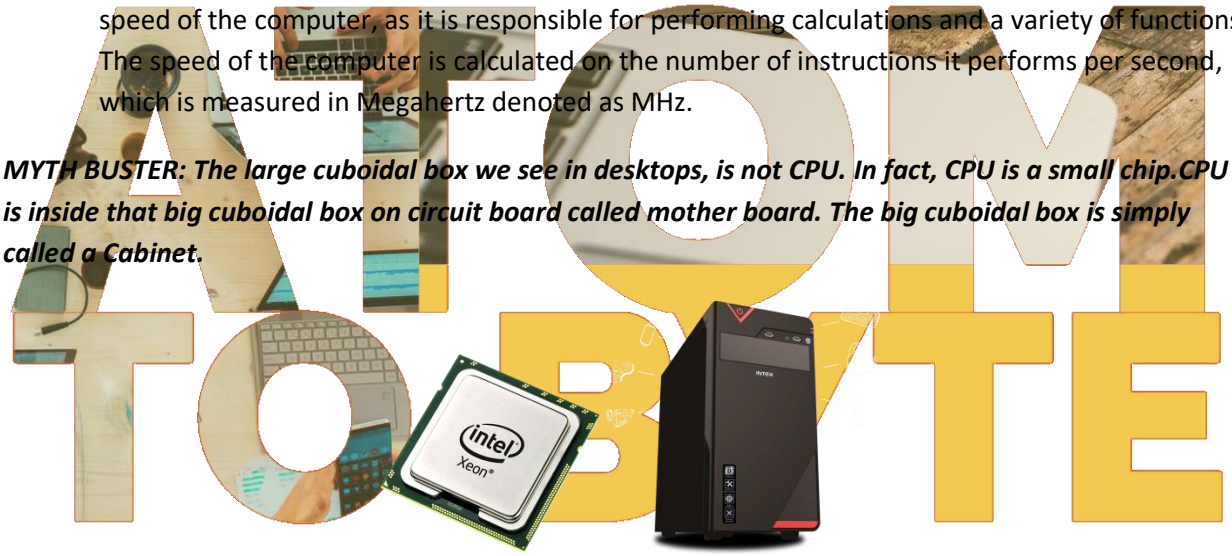
So, what we learned till now is, computer hardware could be any one of the input or output device depending upon the function it performs. Ex: Mouse, Keyboard, Scanner are all input hardware device whereas monitor, speaker, printer are output hardware device.

Basic Organization Of Computer :

The basic organization of the computer includes three parts, i.e

1. **Input Unit** : This unit is responsible for providing data to the computer for further processing and yielding some useful information.
2. **CPU(Central Processing Unit) :** It is also called as the 'Brain of the computer' as it is responsible for managing input and output devices along with performing of arithematic and logical operations of a computer. CPU, is very smalll in size and is called a microprocessor, we will be covering about microprocessor in the future modules. Microprocessor is responsible for the speed of the computer, as it is responsible for performing calculations and a variety of functions. The speed of the computer is calculated on the number of instructions it performs per second, which is measured in Megahertz denoted as MHz.

MYTH BUSTER: The large cuboidal box we see in desktops, is not CPU. In fact, CPU is a small chip.CPU is inside that big cuboidal box on circuit board called mother board. The big cuboidal box is simply called a Cabinet.



CPU and Cabinet

3. **Output Unit :** This unit is responsible for providing the user with useful processed data also called as information.

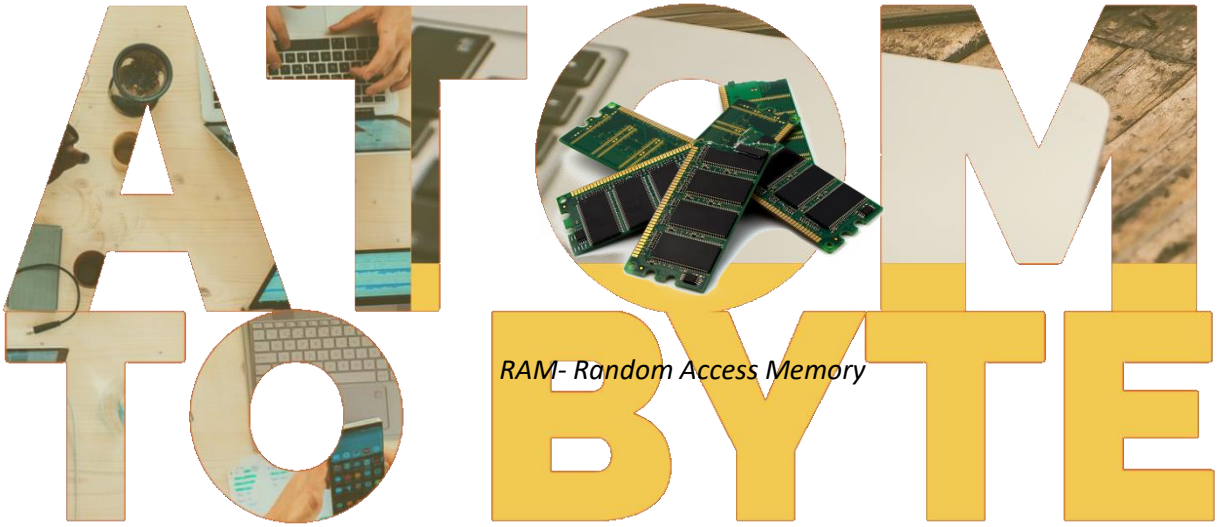
We have discussed a lot about input and output devices, now let us learn something about CPU (Central Processing Unit).

CPU(Central Processing Unit) : As mentioned above, it is the brain of the computer responsible for everything going within your computer system, from managing your hardwae devices such as mouse and monitors to performing complex processes and calculations within it. CPU is just a microprocessor with millions of registers in it, to perform calculations. A register is a component responsible for storing

data/information in form of BINARY i.e. 0 or 1. Since computers only understand binary and not English. Isn't it strange?

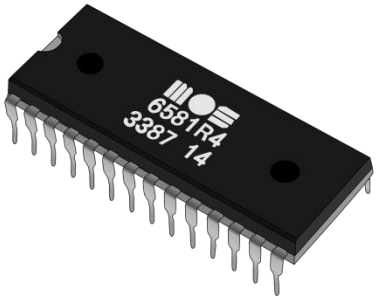
CPU has broadly three parts, i.e.

1. **Memory Unit** : It is responsible for storing both data and information either permanently or temporarily. Memory could either be permanent or temporary, this introduces us to different types of memory.
    1. **RAM :** Stands for Random Access Memory, it is the temporary memory of the computer and all the respective data gets copied to RAM from main memory as soon as we start to perform operations on computer. But, it is temporary, i.e. after you shutdown your computer, everything gets deleted automatically and you won't be able to recover it easily, hence it is volatile in nature. You can think of RAM like a blackboard, which gets rubbed after end of every class and your note copy as ROM, they stay with you even if the class gets over and the blackboard gets erased.



RAM- Random Access Memory

2. **ROM** : Read Only Memory, it is the permanent memory of the computer and all the important files and documents are stored in it. This is non-volatile in nature, means even if the computer is shutdown, the data and information stays.



ROM- Read Only Memory

You can think of RAM like a blackboard, which gets rubbed after end of every class and your note copy as ROM, they stay with you even if the class gets over and the blackboard gets erased.

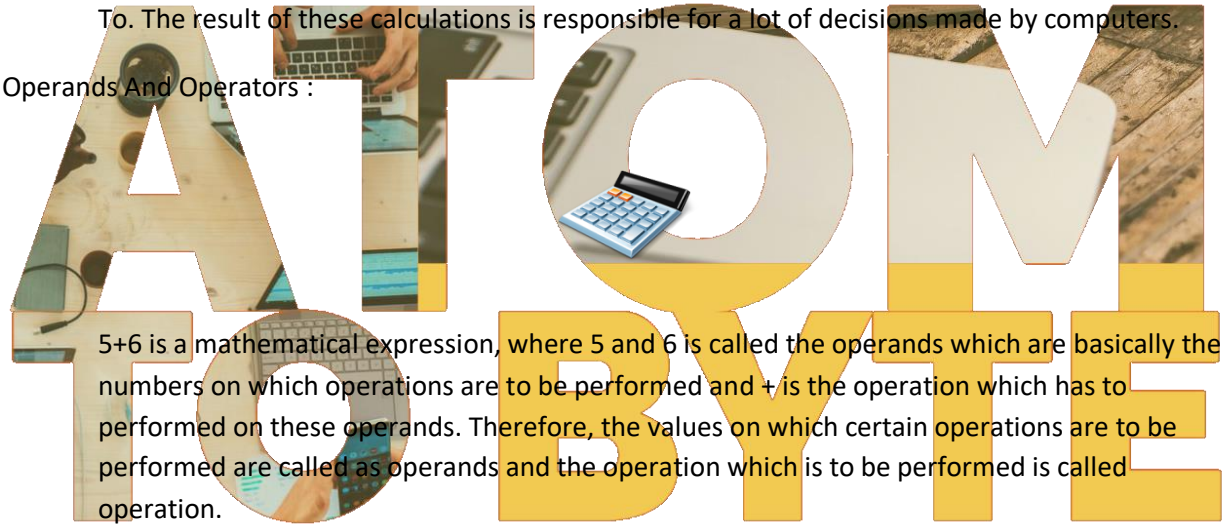
Memory classification could also be done on basis of whether or not the memory is present inside or outside the computer, which brings us to next classification of memory

1. **Internal Memory :** The memory within the computer, such as RAM or ROM is called internal memory.
2. **External Memory :** The memory which is inserted from outside. Ex: Pen drives, external Hard disks, etc

Think it yourself, whether CDs are internal or external memory?

2 . **ALU (Arithmetic Logic Unit) :** This unit is responsible for performing all arithmetic calculations such as Addition, Subtraction, Multiplication and Division and logical operations such as Greater Than, Less Than, Greater Than Equal To, Less Than Equal To, Equal To, Not Equal To. The result of these calculations is responsible for a lot of decisions made by computers.

Operands And Operators :



5+6 is a mathematical expression, where 5 and 6 is called the operands which are basically the numbers on which operations are to be performed and + is the operation which has to performed on these operands. Therefore, the values on which certain operations are to be performed are called as operands and the operation which is to be performed is called operation.

3. **CU (Control Unit) :** This unit controls the operations of other components of computer. It also controls the transfer of data and instructions among other units of computers. In order to execute the instruction, the components of compute receive instruction from the control unit itself.