CPU (Central Processing Unit)

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CPU

CPU is alternatively referred to as the **brain of the computer**, **processor**, **central processor**, or **microprocessor**

The **CPU** was first developed at Intel with the help of Ted Hoff in the early 1970's and is short for **Central Processing Unit**.

The CPU is responsible for handling all instructions it receives from hardware and software running on the computer.

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Main Components

i. ***Control Unit:*** It carries out instructions and tells the rest of the computer system what to do. It sends command signals to the other components of the system.

ii. ***Arithmetic Logic Unit:*** It performs arithmetic calculations and data manipulation, e.g. comparisons, sorting, combining, etc. The computer's calculator part of the CPU is known as the Arithmetic Logic Unit.

iii. ***Main Store or Memory:*** It holds data and instructions which are in current use.

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How CPU Functions?

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Control Unit

Directs the entire computer system to carry out stored program instructions.

Must communicate with both the ALU and main memory.

Co-ordinates the activities of the other two units as well as all peripheral and auxiliary storage devices linked to the computer.

Instructs the ALU which arithmetic operations or logical operation is to be performed.

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Arithmetic Logic Unit

Executes arithmetic and logical operations.

Arithmetic operations include addition, subtraction, multiplication and division.

Logical operations compare numbers, letters and special characters.

Relational operations (=, <, >) are used to describe the comparison operations used by the arithmetic logic unit.

The arithmetic logic unit performs logic functions such as AND, OR and NOT.

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Memory Unit

Holds data and instructions for processing.

Although it is closely associated with the CPU, in actual fact it is separate from it.

Memory associated with the CPU is also called primary storage, primary memory, main storage, internal storage and main memory.

When we load software from a floppy disk, hard disk or CD-ROM, it is stored in the Main Memory.

There are two types of computer memory inside the computer, **RAM** and **ROM.**

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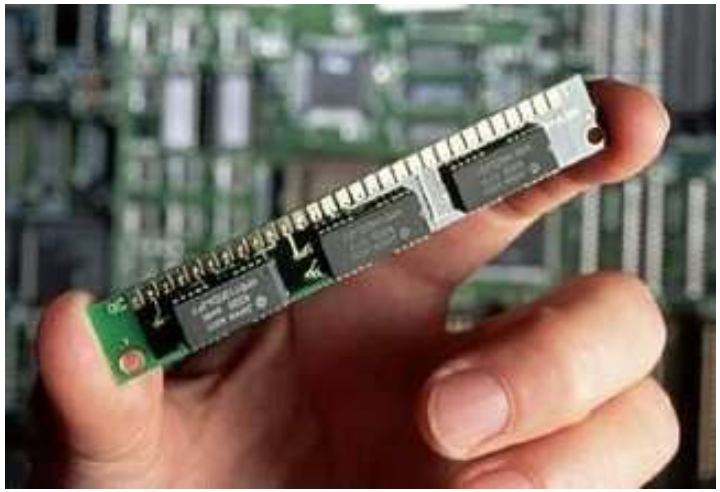
RAM

Random Access Memory

This is really the main store and is the place where the programs and software we load gets stored. When the CPU runs a program, it fetches the program instructions from the RAM and carries them out.



If the CPU needs to store the results of calculations it can store them in RAM.

Random Access Memory can have instructions **READ** from it by the CPU and also it can have numbers or other computer data **WRITTEN** to it by the CPU.

The more RAM in your computer, the larger the programs you can run.

When we switch a computer off, whatever is stored in the RAM gets erased.

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ROM

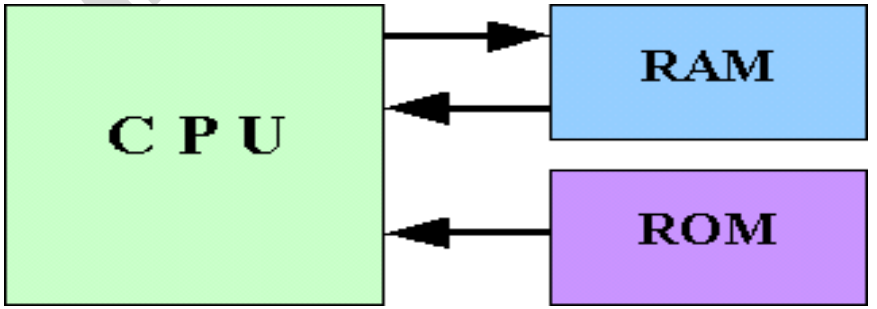
Read Only Memory.

The CPU can only fetch or read instructions from Read Only Memory (or ROM). ROM comes with instructions permanently stored inside and these instructions cannot be over-written by the computer's CPU.

ROM memory is used for storing special sets of instructions which the computer needs when it starts up.

When we switch the computer off, the contents of the ROM does not become erased but remains stored permanently. Therefore it is non-volatile.

This diagram shows the relationship between the CPU and the Main Memory (RAM and ROM).



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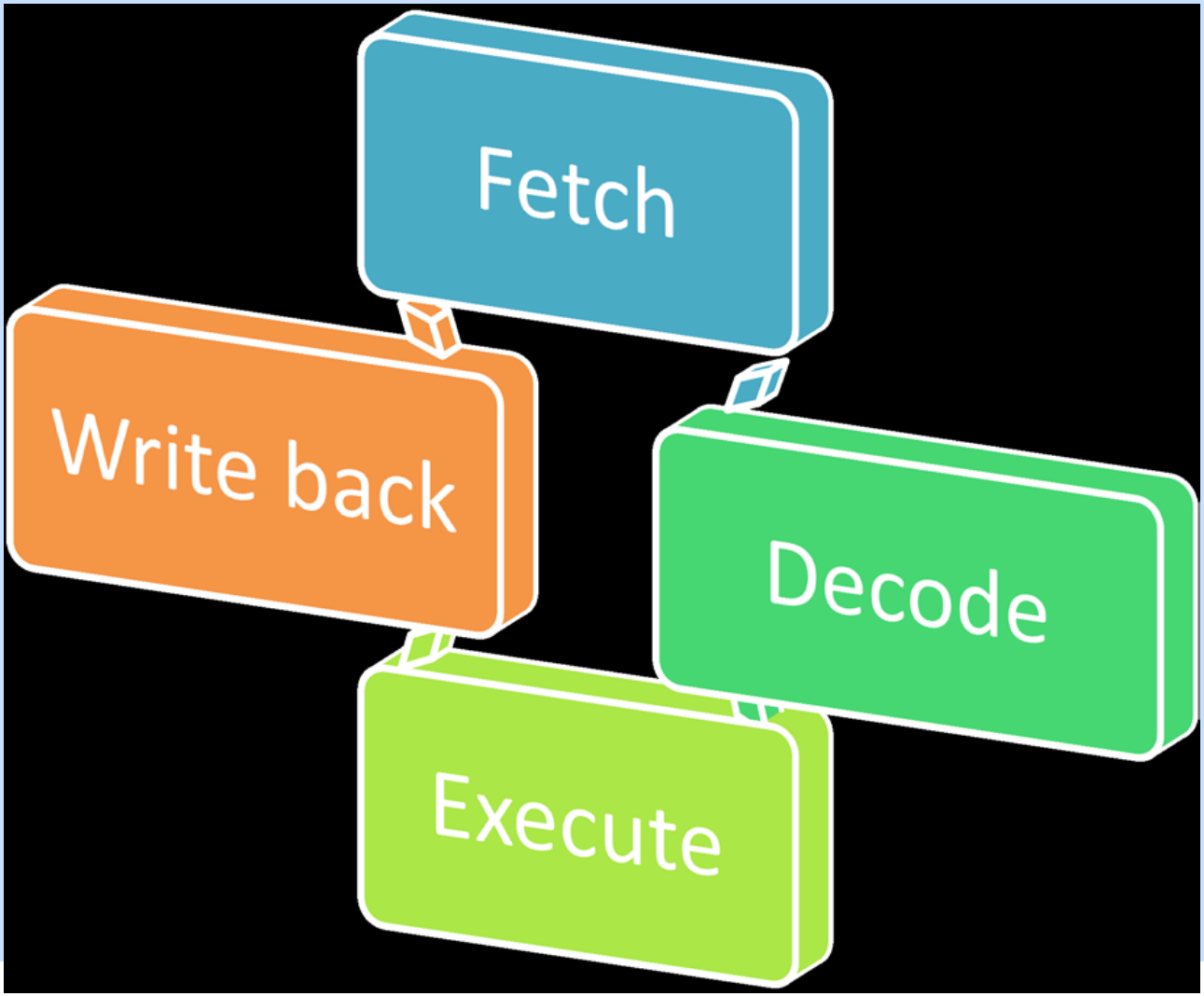
Functions of CPU



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