**NAME: OGUNLEYE MOFEYISOPE SIMISOLA**

**MATRIC NUMBER: 19/sci01/099**

**FUNCTIONS OF THE CPU**

The **central processing unit (CPU)** of a computer is a piece of hardware that carries out the instructions of a computer program. It performs the basic arithmetical, logical, and input/output operations of a computer system. The CPU, or Central Processing Unit, is both the heart and brains of every computer. Every single operation that you do with your computer is processed in the CPU. The performance of your computer is based on simple mathematical operations, and the CPU is the device that controls all of those operations.

The CPU basically has 4 primary functions which are **Fetch, Decode, Execute, Store.** These four operations collectively are called a **machine cycle** or **instruction cycle**also**.** The time required to fetch and decode instruction is called instruction time. The time required for executing and storing is called Execution time. The CPU processes instructions it receives in the process of decoding data. In processing this data, the CPU performs four basic steps:

1. **Fetch:**The first step of a CPU is to fetch instructions from the program memory. Fetch is a process of getting instruction from the memory to execute it. This process is performed by the control unit. Program memory is the location of instruction which a program counter determines. This location stores a number that identifies the address of the next instruction to fetch. The processor takes this address number from the program counter, which is responsible for tracking which instructions the CPU should execute next.
2. **Decode:**After fetching information CPU will determine what to do with that data next, this step is the decode step. Decode is a term used to describe the process of attempting to unencrypt data with or without the proper access. Now the instruction needed to be decoded is sent via the data bus to the control unit, where it is split into two parts. The first part is the operation code or **opcode and** the second part is the **operand**. The circuitry known as the instruction decoder performs this step. All programs to be executed are translated to into Assembly instructions. Assembly code must be decoded into binary instructions, which are understandable to your CPU. This step is called decoding.
3. **Execute:**After the fetching and decoding steps, the execute step takes place. The CPU executes a program that is stored as a sequence of machine language instructions in main memory. It does this by repeatedly reading, or fetching, an instruction from memory and then carrying executing that instruction. Depending on the CPU architecture, this step may consist of a single or sequence of actions. During each action, various parts of the CPU are electrically connected so that they can perform the desired operation. The results of the execution are written on the internal CPU register for quick access. While executing instructions the CPU can do one of three things: Do calculations with its ALU, move data from one memory location to another, or jump to a different address.
4. **Store:** Since CPU must have to give the feedback after executing the data, so the output data is stored in the memory. These memories are slower and less expensive than registers, these are high capacity main memories. This is really part of the execute cycle because some instructions may write to multiple destinations as part of their execution.

**Other functions of the CPU include:**

* Transferring data between memory and input/output devices.
* Controlling all other parts of the machine and sending time signals.
* Performing communication among the input/output devices.
* Performing arithmetical and logical operations.