

BASIC (programming language) Components Microprocessors Microcontrollers

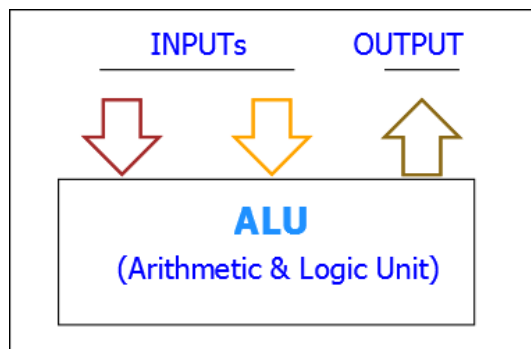
## What are the basic components of a microprocessor?

4 Answers

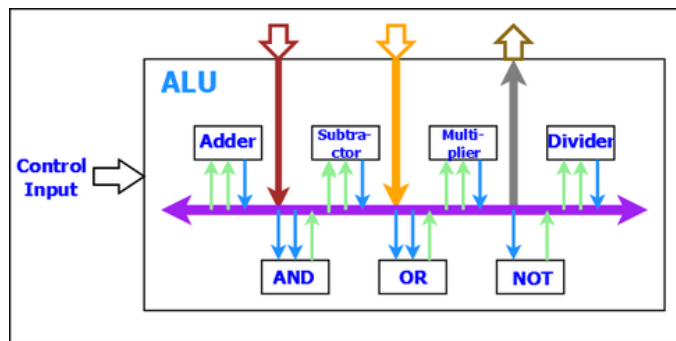


**Balajee Seshadri**, Worked with all types (8 bit - 32 bit) Microcontrollers  
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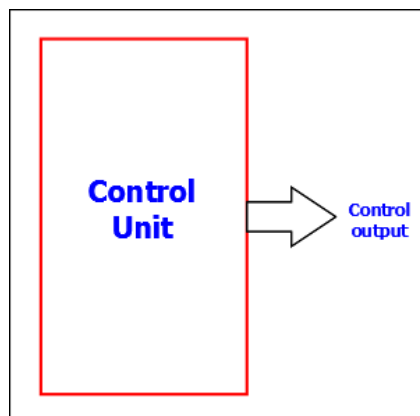
The basic functionality of the Microprocessor is to do processing. Microprocessor performs two type of operations called Arithmetic and Logic. So the basic functionality unit which consists of Arithmetic ( Addition, Subtraction, Multiplication & Division) and Logic (AND, OR, NOT) is called Arithmetic Logic Unit.



Now let us see the how the functions inside are controlled by the ALU



The Control input is the one which informs the ALU units what operations are to be performed. So even though the ALU can perform lots of functions at a time it can perform only one operation based on the control input. This control input to the ALU is generated by the Control unit which is shown below.



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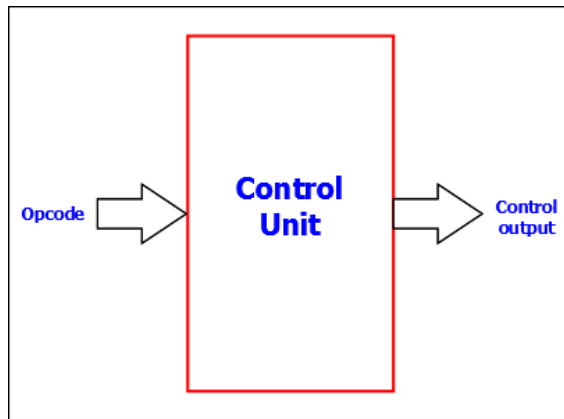
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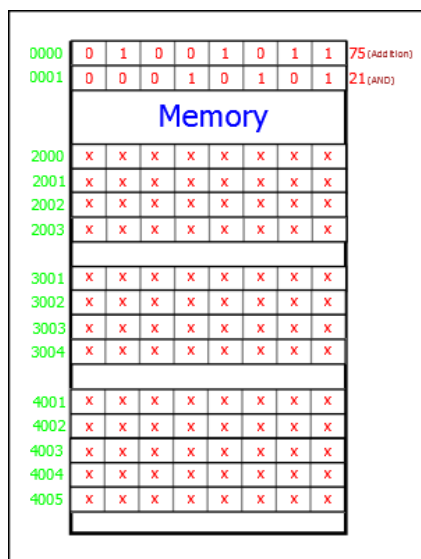
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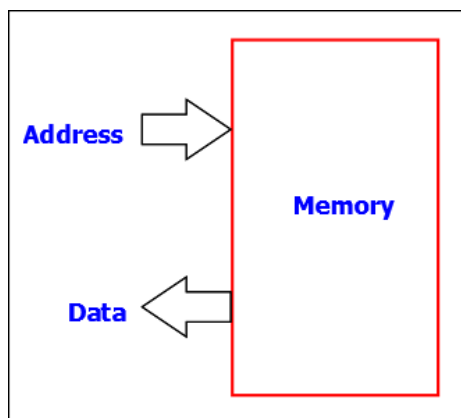
Based on what criteria the Control unit generates the Control output? The control output is generated based on the input called Opcode (Operation Code), can be called as Instruction.



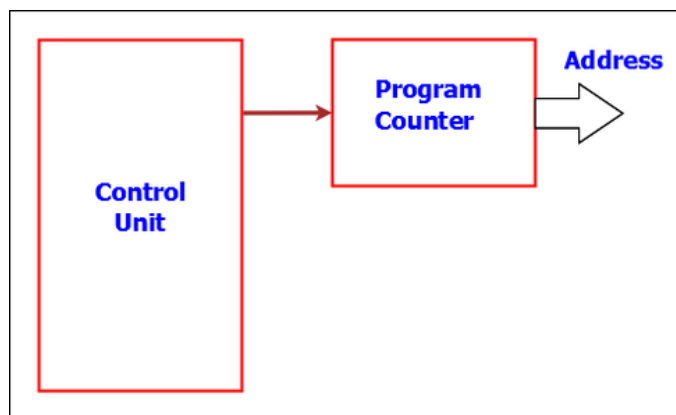
How the Control unit is getting the Opcode. The Opcode is stored in Memory by the User as shown below. The user knows for each Opcode the behavior of the Control unit. For example 75 means Addition, 98 means Multiplication, 87 means Subtraction, 21 means AND like that. Here is a sample memory where top two memory locations are filled with Addition and AND instructions. The other locations are don't care (x).



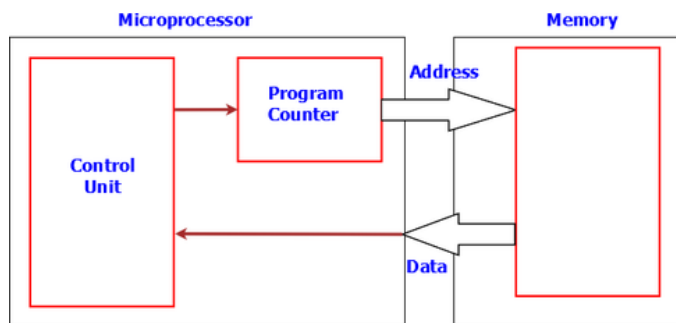
How the memory gives the data? Memory has Address and Data lines. Through the Address lines, it identifies the location and through the Data lines it gives the content outside. We can see this in the diagram below.



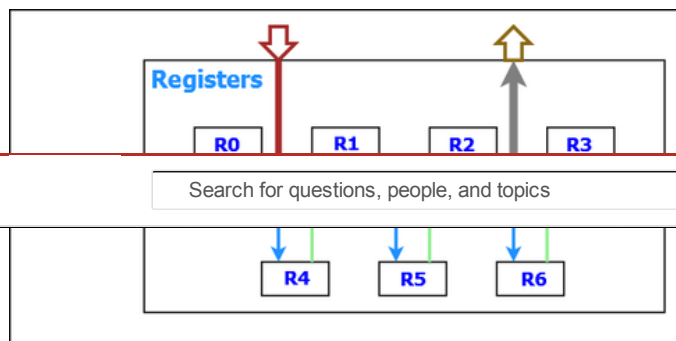
User Stores the data inside Memory (How? We will discuss about this in another answer). Memory is giving the data based on the Address. Who is giving the Address? There is a unit called Program Counter inside Microprocessor. This unit generates the Address. This Program Counter is controlled by the Control Unit.



Now let us connect the Memory to the Microprocessor. So the Address from Program counter is connected to the Address of Memory and the Data from Memory is connected to the Input of Control Unit.



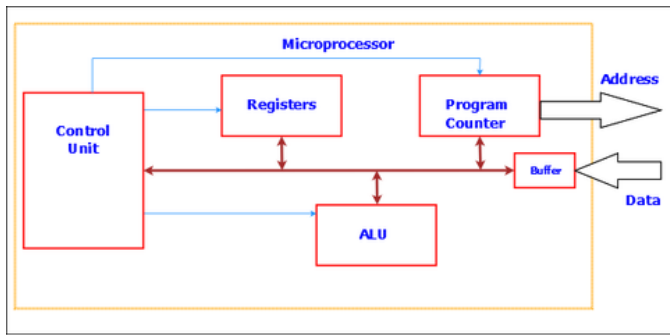
Now most of the parts of microprocessor are discussed. But there is one more important part. This is also very important for programming. Programming is nothing but breaking big task into small tasks and execute the smaller tasks sequentially. But how to link the smaller tasks. So there is a small amount of memory called registers. They are also placed inside Microprocessor to store the temporary data which is generated in between tasks.



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Now let us connect all the components of Microprocessor and Draw single block diagram as show below.



I have just given the bird view of the Microprocessor. I have not mentioned about READ/WRITE or Fetch Unit, etc. But once you understand the above explanation you may understand most of the other microprocessor functionality.

If you need any more detail about Microprocessor, write a comment.

**All the best.**

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**Gokul Kathirvel**, published my project in microprocessor

3.1k Views

I will go with the answer of [Amrisha Vohra](#), It details every part. In organized way, it can be explained as a microprocessor will have three basic units and everything resides within these three units. they are

- **Arithmetic and Logic Unit**
- **Control and Timing Unit**
- **Memory Unit**

In addition to that some sub-primary part resides inside a processor as follow

1. oscillator circuit for timing units (timers and counters)
2. Timer and Counters of-course
3. pointers (stack pointer and program counter)

and Many more..

Written 28 Sep 2015 • View Upvotes



**Amrisha Vohra**, Research scholar by profession, Fitness freak by passion, Go getter by nature!!

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Each microprocessor will have the following basic components:

1. Memory:

- Storage of data
- Storage of a program
- Either can be temporary or “permanent” storage

2. Registers: small, fast memories

- General purpose: store arbitrary data
- Special purpose: used to control the processor

### 3. Instruction decoder:

- Translates current program instruction into a set of control signals

### 4. Arithmetic logical unit:

- Performs both arithmetic and logical operations on data: add, subtract, multiply, AND, OR ...

### 5. Control Unit:

- Control units (CUs) receive signals from the CPU, which instructs the control unit to move data from microprocessor to microprocessor.
- The control unit also directs the arithmetic and logic unit.

### 6. System Bus:

- Many of these components must exchange data with one-another
- It is common to use a 'bus' for this exchange

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**Perumal Seenuvasakumaran**, I have been teaching microprocessor at postgraduate level, for the past 25 years

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First we will define what is a Microprocessor? CPU (Central Processing Unit) on a single chip is called Microprocessor. CPU is the combination of ALU (Arithmetic Logic Unit) and CU (Control unit). This can also be called a Microcomputer. ALU consists of circuits to perform arithmetic operations (adder, subtractor, computational circuits) and logical circuits to take logical decisions. Control unit, consists of timing and control circuits. Which synchronizes every unit of CPU. Internal Registers of definite-bit length, both general purpose and specific purpose are available. CPU, Input, output devices along with the external memory constitute a computer of any type (desk top, lap top etc).

Written 23 Nov 2015

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