**MICROPROCESSOR AND MICROCONTROLLER**

**BY**

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***ABSTRACT***

*This is the program that is used to control the interface between the ROM and RAM, which is microprocessor and microcontroller. It also contain bout the central processing unit, memory, and I/O within the system;* *it is stored in a single integrated circuit which is dedicated to performing a particular task and execute one specific application.*

**INTRODOCTION**

Williams, (2021).

Microprocessor consists of only a central processing unit, whereas micro controller contains a CPU, memory, I/O all integrated into one chip. The microprocessor uses an external bus to interface to ROM, RAM, and other peripherals, on the other hand, microcontroller uses an internal controlling bus. By Williams, L (2021).



**Figure: 1**

**MICROCONTROLLER.**

A microcontroller is a chip optimized to control electronic devices. It is stored in a single integrated circuit which is dedicated to performing a particular task and execute one specific application.

It is specially designed circuit for embedded application and is widely used in automatically controlled electronic devices. It contains memory, processor, and programmable I/O.

**MICROPROCESSOR**.

A microprocessor is a controlling unit of a micro-computer wrapped inside a small chip. It performs Arithmetic Logical Unit (ALU) operations and communicates with it. It is a single integrated circuit in which several functions are combined.

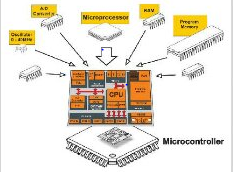
Williams, L (2021).

**There are some advantages of microcontroller are given below,**

1. Low time required for performing operation.
2. The processor chips are very small and flexibility occurs.
3. Due to their higher integration, cost and size of the system is reduced.
4. The microcontroller is easily to interface additional RAM, ROM and I/O ports.
5. Once microcontroller are programmed

**There are some disadvantages of microcontroller are given below,**

1. The microcontroller cannot interface high power devices directly.
2. It has more complex structure as compared to microprocessor.
3. It only performed limited number of execution simultaneously.



**Figure: 2**

**KEY DIFFERENCES**

Microprocessor consists of only a central processing unit, whereas micro controller contains a CPU, I/O, memory all integrated into one chip by

1. Microprocessor is used in personal computers whereas micro controller is used in an embedded system.
2. Microprocessor use an external bus to interface to RAM, ROM, and other peripherals, on the peripherals, on the other hand microcontroller uses a controlling bus.
3. Microprocessor is complicated and expensive, with a large number of instructions to process but microcontroller is inexpensive and straightforward with fewer instructions to process.

**HISTORY OF MICROPROCESSOR**

Here, are the important landmark form the history of microprocessor

1. Fairchild semiconductors invented the first IC (integrated circuit) in 1959.
2. In 1968, Robert Noyce, Gordan Moore, Andrew Grove found their own company intel.
3. Intel grew from 3 man start-up in 1968 to industrial giant by 1981.
4. In 1971, INTEL created the first generation microprocessor 4004 that would run at a clock speed of 108kHz
5. From 1973 to 1978, second-generation 8-bit microprocessor were fabricated like Motorola 6800 and 6801, INTEL -8085, and Zilog’s-Z80.
6. In 1978, intel 8008 third-generation process came into the market.
7. In the early 80s, intel released fourth-generation 32-bit processors.
8. In 1995, intel released in fifth-generation 64-bit processors.

**HISTORY OF MICROCONTROLLER**

Here, are important landmarks from the history of microcontroller:

1. First used in 1975 (Intel 8048)
2. The introduction of EEPROM in 1993
3. The same year, Atimel introduced the first microcontroller using flash memory.

**FEATURES OF MICROCONTROLLER**

By Williams, L (2021).

Here are some important features of microcontroller:

1. Processor reset
2. Program and variable memory (RAM) I/O pins
3. Device clocking central processor
4. Instruction cycle timers

**FEATURES OF MICROPROCESSOR**

By Williams, L (2021).

Here are some important features of microprocessor:

1. Offers built-in monitor/debugger program with interrupt capability
2. Large amount of instructions each carrying out a different variation of the same operation
3. Offers parallel I/O
4. Instruction cycle timer
5. External memory interface **MICROPROCESSOR VS. MICROCONTORLLER**

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**Figure:** **3**

Here is the difference between microprocessor vs. microcontroller



**Figure: 4**

**Microprocessor**   **Microcontroller**

Microprocessor is the heart of Micro Controller is the heart of an

Computer system. Embedded system.

It is only a processor, so memory Micro Controller has a processor

And I/O components need to along with internal memory and I/O

Connected externally. Components.

Memory and I/O has to be Memory and I/O are already present,

Connected externally, so the circuit and the internal circuit is small.

Becomes large.

You can’t use it in compact systems you can use it in compact system.

Cost of the entire system is high cost of the entire system is low.

Most of the microprocessors do not most of the microcontrollers offer

Have power saving features. Power-saving mode.

**APPLICATION OF MICROPROCESSOR**

(John Bull, 2018)

Microprocessors are mainly used in devices like:

1. Calculator
2. Accounting system
3. Games machine
4. Complex industrial controllers
5. Traffic light
6. Control data
7. Military applications
8. Defense systems
9. Computation systems

**APPLICATION OF MICROCONTROLLER**

John B, (2018)

Microcontrollers are mainly used in devise like:

1. Mobile phones
2. Automobiles
3. CD/DVD/ Players
4. Washing machines
5. Cameras
6. Security alarms
7. Keyboard controllers
8. Microwave oven
9. Mp3 players

**Conclusion**

The microprocessor and microcontroller: A microprocessor consists of a central processing unit only, whereas a microcontroller both terms seem similar but there is a huge difference between these

Clock speed: the clock speed of the microprocessor is high. Ti is in terms of the GHz.

Power consumption: the power consumption for the microprocessor is high

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