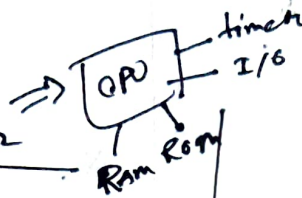


Microprocessor Vs. Micro Controller

Micro Processor



- * CPU is stand-alone, RAM, ROM, I/O, timer are separate.

* Designer can decide on the amount of ROM, RAM, and I/O ports.

* Expensive

* Versatility, General purpose

Micro Controller

CPU, RAM, ROM, I/O, timer

- * CPU, RAM, ROM, I/O & Timer are all on a single chip.

* Fixed amount of on-chip ROM, RAM, I/O ports

* For application in which Cost Power and space are critical

* Single-purpose (Control oriented)

Microprocessor

- * General Purpose
- * High processing power
- * High power consumption
- * Instruction sets focus on processing intensive operations.
- * Typically 32/64 bit
- * Typically deep pipeline (5-20 stages)

Micro Controller

- * ~~Low processing power~~
~~Low processing power~~
- * Low power consumption
- * Bit level operation
- * Instruction sets focus on control and bit level operation.
- * Typically 8/16 bit
- * Typically single cycle / two stage pipeline.

L-6

Memory \Rightarrow Storage device

Storage Device :

- Address
- Register

Major Categories

- Read/write Memory (RAM) — Temporary
- Read only Memory (ROM) — Permanent

Binary address (16 bit data)

	data lines	
	D ₀	
0000		Reg 0
0001		Reg 1
0010		Reg 2
0011		Reg 3
A ₃ — 0100		Reg 4
A ₂ — 0101		Reg 5
A ₁ — 0110		Reg 6
A ₀ — 0111		Reg 7
1000		Reg 8
1001		Reg 9
1010		Reg 10
1011		Reg 11
1100		Reg 12
1101		Reg 13
1110		Reg 14
1111		Reg 15



HealthCare

Oricef
celtriaxone

✓ Each address you can store 8 bit of data at a time.

✓ Each Register and for its particular address can store 8 bit of data at a time and can receive same amount of data at a time.

✓ Each line (data line) represented by a name like Reg 15, Reg 14 to 0.

* Input Devices

- Switches and keypads, USB
- Provide binary information to the MPU

* Output Devices

- LED's and LCD's
- Receive binary information from the MPU.

8086 Architecture
↓
MPC

MPe

(8 bit μp)

⇒ It is an enhanced version of 8085 μ proc designed by the Intel in 1976.

\Rightarrow 16-bit rep.

→ ALU → deal with → 16 bit
data send/receive → 16 bit

⇒ Consisting powerful instruction set (compare to 8085)

⑦ Operation Mode of 8086 \rightarrow more than 1 processor

✓ Max mode :- It is a multiprocessor system.

- ✓ Min Mode :- It is a Single processor system.

Feature of 8086

- * 8086 is a 40 pin IC.
- * It is a 16-bit processor.
- * Its operating volt. is 5 volt.
- * " " frequency is 5 MHz
- * Total memory addressing capacity is 1 MB (External)
- * 16-bit data bus & 20 bit add bus.
- * It has fourteen 16-bit reg.
- * Higher throughput

8085 vs. 8086

Date: _____
=> size of data lines

=> clock speed

=> mem space.

① Size: (ALU size)

- 8085 is 8-bit microprocessor
- 8086 is 16-bit microprocessor

② Address bus:

- 8085 has 16-bit bus while.
- 8086 has 20-bit bus

③ memory:

- 8085 can access up to 64 Kb
- 8086 can access up to 1 Mb of memory.

④ Instruction:

- 8085 doesn't have an instruction queue.
- 8086 has an instruction queue.

⑤ pipelining:

- 8085 doesn't support a pipelined architecture.
- 8086 support a pipelined architecture.

⑥ I/O :-

- 8085 can address $2^8 = 256$ I/O's, whereas,
- 8086 can address $2^{16} = 65,536$ I/O's

⑦ Cost :-

- The cost of 8085 is low where as that of 8086 is high.

⑧ Multiprocessor Support :-

- 8085 doesn't support multiprocessor whereas 8086 support multiprocessor.
 - min mode → multiprocessor
 - max mode → ~~multiprocessor~~ Single.

⑨ Arithmetic Support :-

- 8085 only support integer and decimal
- 8086 supports integer, decimal & ASCII char.

⑩ Multiplication and Division :-

8085 doesn't support whereas 8086

Support.

⑪ Operating modes

8085 Supports only single operating mode
where as, 8086 operating in two modes.

⑫ Memory Segmentation

In 8085, memory space is not a □ Segmented
But in 8086, memory space is segmented.



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microprocessor based system

cpu { Reg, ALU, CU }

⇒ µp based system are electrical sys.

⊗ System H/w

- Discrete Components
Microprocessor, Memory, I/O devices.
- Components connected by Buses
Address, data, Control

⊗ System s/w

⇒ Group of program that monitors the function of entire system.

⇒ MPU & I/O communicates with memory using system bus.

needs
address to take
the result

{ address bus
data bus
Control lines

= address ⇒ Unidirectional bus

* Connect to Memory & I/O

= data bus ⇒ bidirectional bus

* Transfer binary data & instructions.

= Control lines ⇒ Read/write
Timing ~~and~~ Signals

