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Embededd System

- Embedded System concept
- Computer system
- SB & SOC
- ICS types
- MCU & MPU
- RISC & CISC
- Memory

What the meaning of Embedded System ?

An **embedded system** is a **mini-computer** that performs a specific task within a **larger device** or system

Computer system consist of :-

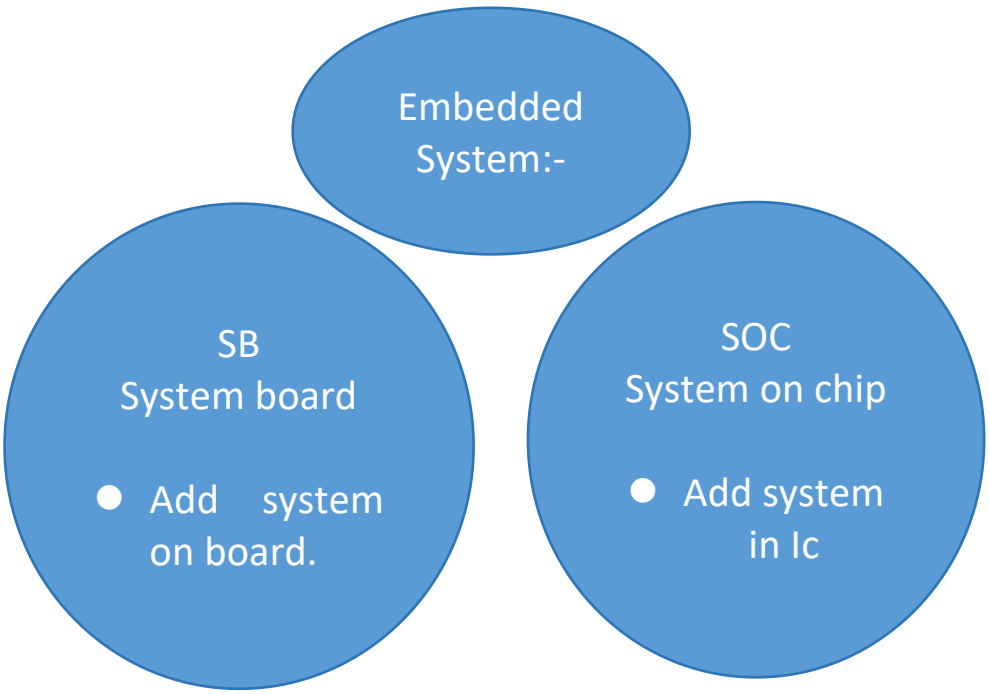
1. Processor
2. Memory
3. I/O

Computer System Type:-

- General perpos
- Specific perpos

At Embedded System we Should Constrain

- Power
- Cost
- Speed
- Size



	SB	SOC
size		
power		
cost		
performance		
config	We can config it :- Ex: memory	

SOC better than SB but we can config SB

IC :-

integrated circuit

Single chip , it performs a specific job

ex: 555 , op-amp

VLSI :-

Very large scale integrated circuit , It contains millions transistors in chip

Low size

High functionality

ICS Types:-

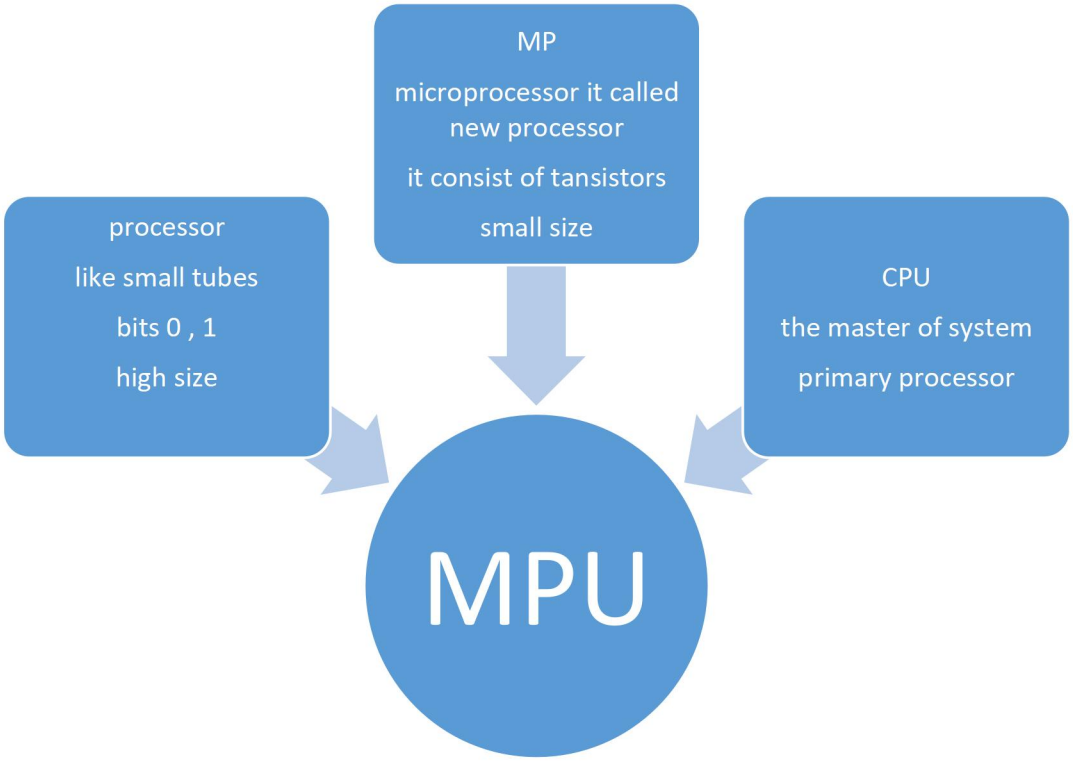
- Microcontroller
- Microprocessor
- SOC
- RAM , ROM

The system consist of:-

I/O , memory , processor

Processor → MPU (microprocessor unit)

His mission is work fetch, decode , excute to instructions.



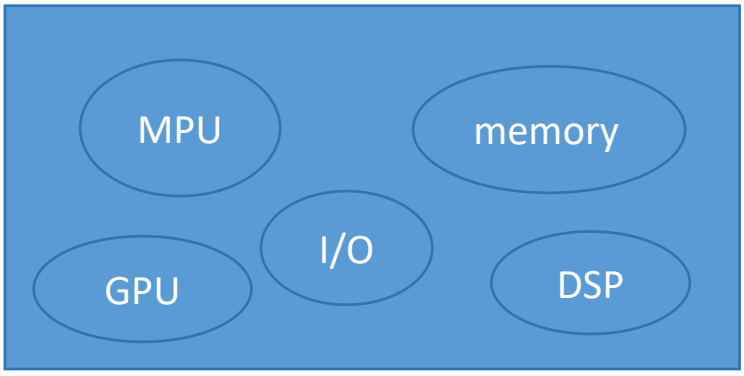
The difference between MPU & MCU:-

MCU like small computer system in ic

MPU part of MCU

MCU →

Mcu high performance (soc)



MPU : primary processor

DSP : designed for processing degital signals

GPU:designed to accelerate the creation the image and videos

Dsp and Gpu called second processors

● Instractions_Set_Arti (ISA):-

	RISC	CICS
software	need strong software	need simple software
cost	High sw, low Hw Same	low Hw, High sw same
power	ALU low, ID high	ALU high , ID low
performance	Hw high, sw low same	Hw low, sw high same

Memory:-

is considered of collection of some locations, the size of locations depends on the Architecture

Types of memory:

1) volatile:RAM
2) non volatile: ROM
3) Hybrid: it is mix between RAM and ROM

volatile memory:RAM

Read and write memory is faster than ROM,RAM is called RWM

Type of RAM:

SRAM & DRAM

nonvolatile memory:ROM

Read only memory or program memory

Types of ROM:

Mask programming ROM

PROM & EPROM

Hybrid:

take the best from RAM can be Read and Write , the best from ROM(Non-volatile)

Types of ROM:

E^2 PROM

flash

NVRAM