Introduction

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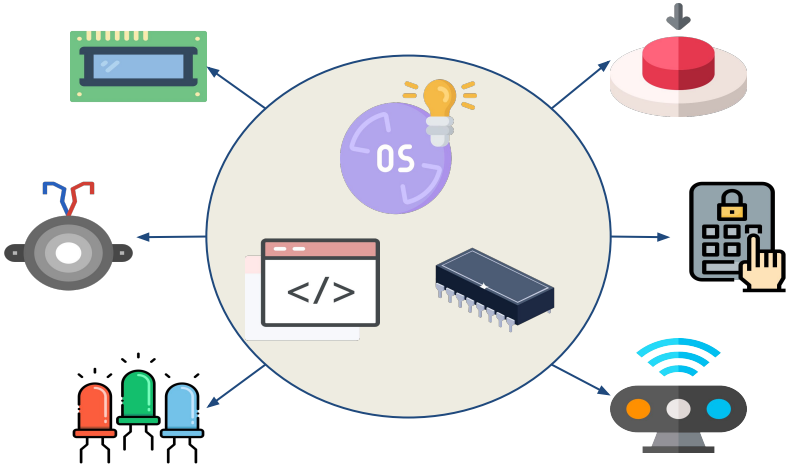
Outlines

- What is Embedded systems?
- Embedded systems characteristics
- Embedded Systems Advantages and disadvantages
- Embedded Systems applications

What is an Embedded System?

- It is a hardware controlled by a software to perform a specific and periodic functionality.
- It may be real-time or not.



Embedded systems characteristics

- **Single-functioned**: repeated single functionality.
- **Tightly constrained**: small size, speed, low power consumption.
- **Reactive and Real time**: reacts to change in system environment.
- **Microprocessors based**: no embedded system without a microprocessor or a microcontroller.
- **Memory**: limited memory size.
- **Connected**: must be connected to input and output devices.

Embedded Systems Advantages and disadvantages

- **Advantages**:
  - Easily Customizable
  - Low power consumption
  - Low cost
  - Enhanced performance
- **Disadvantages**:
  - High development effort
  - Limited resources, memory, processing speed

Embedded Systems applications

- **Automotive**: Cruise control, light control, ABS, EBD,ESP, ... etc.
- **Networking**: Routers.
- **Fintech**: ATM, Point Of Sale, Vending machines, ... etc.
- **Home appliances**: Home automation, Air conditioners, microwave ovens, washing machines and dishwashers, ... etc.
- **Biomedical**: Wearable devices, Teleradiology, ... etc.
- **Military**: Missile targeting systems, command-and-control systems, electronic warfare, ... etc.
- **Consumer Electronics**: MP3 players, television sets, mobile phones, video game consoles, digital cameras, GPS receivers, printers, ... etc.

Summary

- You have learned what embedded systems are and it components
- Remember that embedded systems have limited resources.
- Embedded systems are around us and every where.