Embedded System

An **embedded system** is a combination of **hardware and software** designed for a specific faction.

For example - a fire alarm is an embedded system it will sense only smoke.

Embedded system
An embedded system has three components:

      It has hardwear

      It has a application software

      It has a **real time operating system (RTOS)** that supervises the application software and provides a mechanism to let the processor run a process as per scheduling by following a plan to control the latencies. RTOS defines the way the system works; it sets the rules during the execution of application programming. A small scale embedded system may not have RTOS.

So we can define an embedded system as a **Microcontroller based, software driven, reliable, real time controlling system.**

Characteristics of embedded system

Requires less power - Embedded systems don't require much power to operate.
Low cost - The price of an Embedded system is not so expensive .
Task specific - Embedded system performs some specific function or task.
Highly stable - Embedded systems do not change frequently, mostly fixed maintaining stability.
High reliability - Embedded systems are reliable and perform the tasks consistently well.
High efficiency - Embedded system efficiency is so high.
Manual user interface - These systems require less user interface and are easy to use.
Time specific - It performs the task with in a certain time frame.

Types of embedded system

Embedded system can be classified based on ;

      Perform and functional requirement

         Realtime

            Heard real time embedded system.

            Soft real time embedded system.

         Standalone embedded system.

         Network based embedded system.

         Mobile based embedded system.

Perform of the microcontroller.
        Small scale
        Medium scale
        Sophisticated scale

Application of embedded system

Some real life application of embedded system are as follows

Consumer electronics - televisions and digital cameras, computers, printers, video games consoles and home entertainment systems like PS4.

Household applications - refrigerators, washing machines, microwave, ovens, air conditioner.

Medical equipment - scanners like those for MRI,CT,ECG machines, devices to monitor blood pressure and heartbeat

Automobiles - fuel injection system, anti-lock braking systems, music and entertainment systems, control for air conditioner.

Industrial applications - Assembly line, system for feedback systems for data collection

Aerospace - Systems for navigation and guidance, GPS

Communications - Routers , satellite phones.