IoT Assignment

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1. What is an Embedded System?

Ans: An automotive embedded system refers to the network of electronic components and software integrated within a modern vehicle, enabling it to perform various functions efficiently and safely. These systems encompass a wide range of applications, such as engine control, transmission management, safety features (like airbags and anti-lock brakes), entertainment and navigation systems, and more. They rely on sensors, processors, actuators, and communication protocols to gather and process data, making split-second decisions that optimize performance, enhance safety, and provide a seamless driving experience.

1. State the different Components of an embedded system.

Ans: Hardware: The hardware components of an embedded system are the physical parts of the system, such as the processor, memory, sensors, actuators, and I/O devices.

Processor: The processor is the brain of the embedded system. It is responsible for executing the software programs that control the system.

Memory: The memory stores the data and programs that are used by the processor.

Sensors: Sensors measure physical quantities, such as temperature, light, and pressure.

Actuators: Actuators control physical devices, such as motors and valves.

I/O devices: I/O devices allow the embedded system to communicate with the outside world, such as a keyboard, display, or network interface.

Software: The software components of an embedded system are the programs that control the system.

Firmware: Firmware is the software that is permanently stored in the hardware of the embedded system. It is responsible for initializing the system and loading the operating system.

Operating system: The operating system is responsible for managing the resources of the embedded system, such as the processor, memory, and I/O devices.

Application software: Application software is the software that performs the specific tasks of the embedded system.

1. Explain Automotive car embedded system.

Ans: Automotive car embedded systems are computer systems that control and monitor various functions of a vehicle. They are used in a wide range of applications, including safety, performance, and comfort.

Here are some examples of automotive embedded systems:

Engine control unit (ECU): Controls the engine's operation, including fuel injection, ignition timing, and emissions.

Anti-lock braking system (ABS): Prevents wheels from locking up during braking.

Electronic stability control (ESC): Helps to keep the vehicle stable during cornering.

Infotainment system: Provides entertainment and information to the driver and passengers.