TASK1

Smart Environmental Monitoring System

A smart environmental monitoring system is a network of sensors, devices and software that work together to monitor, collect, and analyze data about environment. It helps to manage and collect real time data about environmental parameters. It can be used in agricultural sectors, industrial sites, natural habitats, etc.

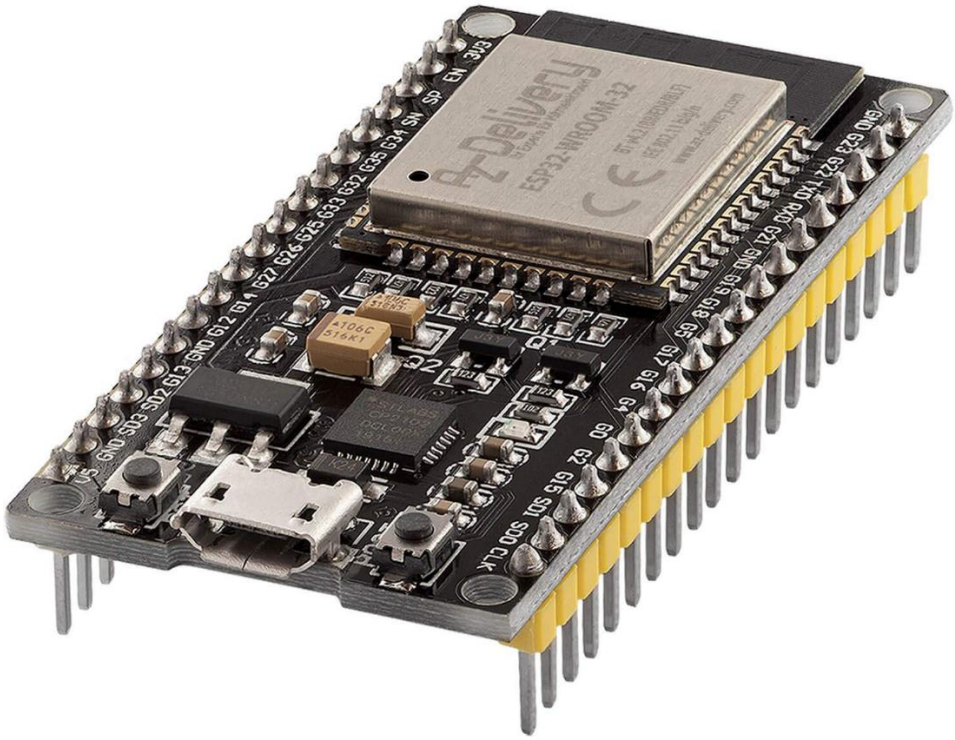
It helps in making the management easier, saving cost price and increase efficiency of process.

Components for the smart environmental monitoring system.

Below is the list of components that will be used in making the system along with the communication interface and cost.

1) MCU (ESP32)

- **Function**-It controls and processes data
- **Estimated cost**- $10
- **Communication Interface**- Wi-Fi, Bluetooth, UART, SPI, I2C
- **Power supply**- 5V, 1A



2) Temperature Sensor (DS18B20)

- **Function-** Measures temperature
- **Estimated cost**- $5
- **Communication interface**- 1-Wire
- **Power Supply**- 3.3V, 0.5mA

3) Humidity Sensor (DHT11)

- **Function**-Measures humidity
- **Estimated Cost-** $5
- **Communication Interface-** 1-Wire
- **Power Supply-** 3.3V, 0.5mA

4) Air Quality Sensor (MQ135)

- **Function-** Measures air quality
- **Estimated Price-** $10
- **Communication interface**- Analog
- **Power Supply** -5V, 100mA

5) Noise Sensor (LM386)

- **Function-** Measures noise levels
- **Estimated Price**- $8
- **Communication Interface** - Analog
- **Power Supply**- 9V, 20mA

6) Light Sensor (LDR)

- **Function**- Measures light intensity
- **Estimated Price**- $3
- **Communication Interface**- Analog
- **Power Supply-** 5V, 10mA

7) GPS Module (NEO-6M)

- **Function**- Provides location data
- **Estimated Price**- $20
- **Communication Interface**- UART
- **Power Supply**- 3.3V, 50mA

8) Wi-Fi Module (ESP8266)

- **Function**- Enables Wi-Fi connectivity
- **Estimated Price**- $15
- **Communication Interface**- Wi-Fi
- **Power Supply**- 3.3V, 200mA

9) SD Card Module

- **Function**- Stores data
- **Estimated Price**- $10
- **Communication Interface**- SPI
- **Power Supply**- 3.3V, 50mA

10) Buzzer

- **Functions**- Alerts for threshold exceedance
- **Estimated Price**- $2
- **Communication Interface**- Digital
- **Power Supply**- 5V, 20mA

11) LED Indicators

- **Functions**- Visual indicators
- **Estimated Price**- $5
- **Communication Interfaces-** Digital
- **Power Supply**- 5V, 10mA

- The power consumption of each component is relatively low, making it suitable for battery-powered applications.
- The MCU (ESP32) supports multiple communication interfaces, including Wi -Fi, Bluetooth, UART, SPI, and I2C.
- The estimated cost may vary depending on the supplier and location.

TASK- Assume you are an embedded engineer tasked with designing a smart environmental monitoring system. To ensure the project is well organized and all components are accounted for, prepare a table listing the components, their functions, estimated costs, and the microcontroller(MCU) to be used.

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