ENVIRONMENT MONITORING

The goal of this project is to design, develop, and implement an advanced environment monitoring system that leverages cutting-edge sensor technologies, data analysis techniques, and remote communication capabilities to continuously collect, analyze, and disseminate crucial environmental data. This system will provide real-time insights into various environmental parameters, including air quality, temperature, humidity, water quality, and more, in order to facilitate informed decision-making and promote environmental sustainability. The project aims to create a scalable and adaptable solution that can be deployed in diverse settings, ranging from urban areas to remote wilderness locations, with the overarching objective of monitoring and safeguarding our natural ecosystems and human health. Through the integration of IoT devices, data analytics, and user-friendly interfaces, this project seeks to empower stakeholders, including government agencies, researchers, and the general public, to actively participate in environmental protection and conservation efforrt. In a world facing escalating environmental challenges, our project aims to create an advanced environment monitoring system that leverages cutting-edge technology to comprehensively assess and manage environmental conditions. Through a holistic approach, this project intends to monitor key parameters such as air quality, water quality, biodiversity, climate variables, and more, across diverse ecosystems. By providing real-time, high-quality data and actionable insights, our project aims to empower individuals, communities, and decision-makers to take informed actions towards a more sustainable and resilient future.

```python
import board
import adafruit_dht

# Initialize the sensor
dht_sensor = adafruit_dht.DHT22(board.D4)

# Read temperature and humidity data
temperature_celsius = dht_sensor.temperature
humidity = dht_sensor.humidity

print(f"Temperature: {temperature_celsius}°C, Humidity: {humidity}%")
```

IoT Integration: Implement IoT (Internet of Things) technology to enable real-time data transmission and remote monitoring, facilitating swift responses to changing environmental conditions.Utilize state-of-the-art sensor technology to ensure accuracy, reliability, and versatility in data collection, encompassing parameters such as pollutants, temperature, humidity, and species diversity.

Design an Iot based environmental monitoring system

In our project we are monitoring the temperature and humidity level in children park and theme park ,

outdoor places

So we need to specify park and them park ,outdoor places setup the system to display the level of temperature and humidity to people

Components:

1.Microcontroller and sensor: Choose a microcontroller with built-in Wi-Fi connectivity to ESP8266 or ESP32.

2.Temperature and Humidity Sensor: Need to measure temperature and humidity. The DHT11, DHT22, and BME280 sensor are common choices.

3.Power Supply: which can be a used rechargeable battery or adapter

4.Internet Connectivity: Wi-Fi module to connect the sensor to cloud

5.Enclosure: The system will be deployed in a harsh environment, we need an enclosure to protect the electronics.

6.Software Development Tools: To install syder python IDE in our windows laptop

Procedure:

1.Connect the Sensor: Wire up the temperature and humidity sensor to our Arduino Uno,ESP8266,ESP32.

2.Connect the Display: Connect the display to the microcontroller and program it to display the data.

3.Connect the Wi-Fi Module: Configure the Wi-Fi module to connect to our local Wi-Fi network.

4.Write the Code: Write the code for microcontroller to read data from the sensor, display it on the screen, and send it to the IoT platform.

5.Set up the IoT Platform: Create an account on your chosen IoT platform Google cloud IoT. Permissions, and other necessary configurations.

6.Send Data to IoT Platform: Modify our code to send the temperature and humidity data to the IoT platform. Use protocols like MQTT or HTTP.

7.Create a Mobile App or Web Interface: create web page to visualize the data.

8.Remote Monitoring: Access our temperature and humidity data remotely via web interface.

9.Power Supply: Ensure setup has a reliable power source.

10.Testing and Calibration: Test the system for accuracy, and calibrate the sensors if necessary.11.Maintenance: Regularly monitor and maintain the system to ensure it continues to work correctly.

Program:

```
Print(“Environmental monitoring”)
Import machine
Import time
import ujson
Import urequests
Define the MQTT broker parameters
```

```
MQTT_BROKER = “localhost”
MQTT_PORT = 1883
MQTT_TOPIC = “/environment/data”
# Define the DHT22 sensor parameters
DHT22_PIN = 13
# Define the DHTT sensor objects
dhtt = machine .DHTT(DHT22_PIN)
# Connect to the MQTT broker
Client = urequests.clients( )
Client.connect(MQTT_BROKER, MQTT_PORT)
# Publish the environment data to the MQTT topice
Def publish_data(temperature, humidity);
 Data = {“temperature”: temperature, “humidity” : humidity}client.publish(MQTT_TOPIC,
json_data)
# Start a loop to read the DHT22 sensor and publish the data to the MQTT broker
While True :
 # Read the temperature and humidity from the DHT22 sensor
 temperature, humidity = DHT22.read()
 # Publish the environment data to the MQTT topic
 publish_data(temperature, humidity)
# Wait for 10 seconds before reading the sensor again
```