**Project. : Environment monitoring in park**

**Phase2: INNOVATION**

**Abstract**:

Air quality, water pollution, and radiation pollution are major factors that pose challenges in the environment. Suitable monitoring is necessary so that the world can sustainable growth, by maintaining a healthy society. In recent years, the environment monitoring has turned into a smart environment monitoring (SEM) system, with the advances in the internet of things (IoT) and the development of modern sensors. Under this scenario, the present mar aims to accomplish a critical review of noteworthy contributions and research studies c that involve monitoring of air quality, water quality, radiation pollution, and agricultures The review is divided on the basis of the purposes where SEM methods are applied, and the purpose is further analyzed in terms of the sensors used, machine learning techniques in and classification methods used. The detailed analysis follows the extensive review with suggested major recommendations and impacts of SEM research on the basis of discussion res research trends analyzed. The authors have critically studied how the advances in sensor ted IoT and machine learning methods make environment monitoring a truly smart monitoring Finally, the framework of robust methods of machine learning; denoising methods and devel of suitable standards for wireless sensor networks (WSNs), has been suggested.

For an environmental monitoring project in a park using ESP32 and Arduino UNO microcontrollers, here’s a more detailed breakdown:

**Microcontrollers**:

1. **ESP32**:

As previously mentioned, the ESP32 is a powerful microcontroller with built-in Wi-Fi and Bluetooth capabilities, making it suitable for IoT projects. It can collect data and send it to a cloud platform.

1. **Arduino UNO**:

The Arduino UNO is a simple microcontroller suitable for basic tasks. In this project, it can be used for simple data collection tasks or as a backup device.

**Sensor**:

For monitoring temperature and humidity in an outdoor park environment, you can use a sensor like the DHT22 or DHT11, as previously described in the technical specs section.

**Connectivity**:

You can utilize multiple connectivity options for redundancy and flexibility:

**BLE (Bluetooth Low Energy)**:

This can be used for short-range communication, such as configuring or troubleshooting devices in the park.

**Wi-Fi**:

Use Wi-Fi to connect your devices to the internet and post data to a cloud platform. This allows remote access to the data.

**Zigbee**:

If your park covers a large area, Zigbee can be useful for creating a mesh network for communication between devices, especially in areas with limited Wi-Fi coverage.

**Cloud**:

You mentioned using Beeceptor for data handling and testing. While Beeceptor is a great choice for development and testing, for a production environment, you might consider a more robust cloud platform like AWS, Azure, Google Cloud, or a dedicated IoT platform to securely store and analyze your data.

**Protocols**:

Your chosen protocols are suitable for IoT data communication:

**MQTT**:

Ideal for efficient and lightweight communication between devices and the cloud, especially when dealing with intermittent connections or low bandwidth.

**HTTP**:

Useful for sending data to web servers or APIs. It’s a standard protocol for web communication.

**AMQP**:

A more advanced protocol suitable for complex IoT scenarios that require advanced message handling and queuing.

In your park environmental monitoring project, these components and technologies will enable you to collect temperature and humidity data from various sensors, transmit it using multiple connectivity options, and store and analyze the data in a cloud platform, ensuring reliable monitoring and reporting for public access.