ENVIRONMENTAL MONITORING SYSTEM

Project Objectives:

1. Real-time Environmental Monitoring:

- Implement IoT sensors to collect real-time data on temperature and humidity in public parks.
- Ensure continuous monitoring and data updating at regular intervals.

2. Aiding Park Visitors in Activity Planning:

- Develop algorithms to interpret environmental data and provide recommendations to park visitors.
- Provide insights, such as suggesting suitable times for picnics, outdoor sports, etc., based on current environmental conditions.

3. Promoting Outdoor Experiences:

- Create features on the platform that highlight the benefits of outdoor activities, considering the current weather conditions.
- Provide tips and suggestions for outdoor activities during specific weather conditions.

4. Enhancing Visitor Satisfaction:

- Gather user feedback through the platform to understand visitor preferences and improve the system accordingly.
- Implement user-friendly interfaces and interactive features on the platform to enhance user experience.

IoT Devices Designs:

1. Sensor Selection:

- Choose appropriate temperature and humidity sensors compatible with IoT technology.
- Ensure sensors are durable, weather-resistant, and capable of providing accurate real-time data.

2. Deployment Plan:

- Strategically place sensors in different areas of the parks to ensure comprehensive coverage.
- Consider factors like park size, topography, and visitor density when deciding sensor deployment locations.
- Regularly calibrate and maintain sensors to ensure data accuracy.

Environmental Monitoring Platform:

1. Web-Based Platform Design:

- Create an intuitive and visually appealing web interface accessible to park visitors.
- Display real-time temperature and humidity data along with graphical representations for easy understanding.
- Include interactive maps showing sensor locations and real-time data from each location.

2. User-Friendly Features:

- Implement user profiles, allowing visitors to customize their preferences and receive personalized activity suggestions.
- Include historical data and trends to help users make informed decisions about their park visits.
- Integrate notifications/alerts to inform users about significant weather changes or ideal outdoor activity times.

Integration Approach:

1. Data Transmission:

- Utilize IoT communication protocols (such as MQTT or HTTP) for transmitting data from sensors to the monitoring platform securely.
- Implement encryption and authentication methods to ensure data privacy and security during transmission.

2. Data Processing and Presentation:

- Develop backend scripts using Python to process incoming data, perform analysis, and generate recommendations.
- Use Python frameworks like Django or Flask to create the web application for the monitoring platform.
- Ensure seamless integration between the sensor data processing scripts and the web application for real-time updates.

3. Scalability and Maintenance:

- Design the system architecture to be scalable, allowing for the addition of more sensors or features in the future.
- Implement a robust maintenance plan, including regular sensor checks, software updates, and user support mechanisms.