About the Project

The acidic rain detector aims to monitor the acidity level of rainwater in real-time using an Arduino Uno microcontroller. The system consists of three main components: a rain sensor, a servo motor, and a pH sensor.

1. Rain Sensor:

The rain sensor is used to detect the presence of rainwater. It is typically a module that contains a conductive surface and a control board. When rainwater falls on the conductive surface, it creates a conductive path, triggering the sensor. The rain sensor is connected to one of the Arduino's digital input pins.

2. Servo Motor:

The servo motor is used to open and close a water container when acidic rain is detected. It is a small motor that can rotate to a specific angle. The servo motor is connected to one of the Arduino's digital output pins. By controlling the servo motor's angle, the water container lid can be opened or closed.

3. pH Sensor:

The pH sensor is used to measure the acidity level of the collected rainwater. It is an analog sensor that provides a voltage output proportional to the pH value. The pH sensor is connected to one of the Arduino's analog input pins. The Arduino reads the analog voltage and converts it into a pH value using appropriate calibration and conversion formulas.

How the System Works:

1. Rain Detection:

- The rain sensor continuously monitors the presence of rainwater.

- When rain is detected, the Arduino receives a signal from the rain sensor's digital output pin.

- The Arduino processes the signal and proceeds to the next step.

2. Water Container Control:

- Upon rain detection, the Arduino activates the servo motor.

- The servo motor rotates to open the lid of the water container, allowing rainwater to be collected.

- The container remains open as long as rain is detected.

3. Acidic Rain Analysis:

- While rainwater is being collected, the pH sensor measures the acidity level of the water.

- The analog output of the pH sensor is read by the Arduino's analog input pin.

- The Arduino converts the analog voltage into a pH value using appropriate calibration and conversion formulas.

4. Acidic Rain Alert:

- Based on the pH value obtained, the Arduino can compare it to a predefined threshold to determine if the rainwater is acidic.

- If the pH value exceeds the threshold, the Arduino can activate an alert system, such as sounding an alarm or displaying a warning message.

5. Water Container Closure:

- After the analysis is complete or when rain is no longer detected, the Arduino commands the servo motor to close the lid of the water container.

By combining the rain sensor, servo motor, and pH sensor with the Arduino Uno, an acidic rain detector system can be created. This system allows for real-time monitoring of rainwater acidity and provides alerts if acidic rain is detected.