

ENVIRONMENTAL MONITORING

Phase-4 Project

DONE and PRESENTED BY:

- SUDARSHAN R
- RAYYAN J
- YOGAVAITHEESHVARAN S
- VIGENSH J

AS WE DISCUSSED IN OUR EARLIER SUBMISSIONS, HERE WE GOING TO SIMULATE OUR PROJECT IN WOKWI SIMULATOR PLATFORM AS YOU MENTIONED.

ALSO WE USED VISUAL STUDIO CODE(VSC) TO WORK WITH SOME WEB DEVELOPMENT PROCESS WHICH INCLUDES HTML5,CSS3,JAVASCRIPT.

THE FOLLOWING ARE THE DETAILS THAT DEPICTS ABOUT OUR PROJECT WORK. THANK YOU

SENSORS USED:

HC-SR04,

DHT22,

NTC(temperature).

HUMUDITY,SOIL MOISTURE AND RAINFALL .

PROGRAM CODING:

```
<!DOCTYPE html>
<html lang="en">

<head>
  <meta charset="UTF-8">
  <meta name="viewport" content="width=device-width, initial-scale=1.0">
  <title>Arduino Sensor Data</title>
  <style>
    body {
      font-family: Arial, sans-serif;
      text-align: center;
    }

    .sensor-data {
      margin: 20px;
    }

    .sensor-values p {
      margin: 5px 0;
    }

    .led {
      width: 50px;
      height: 50px;
      border-radius: 50%;
      background-color: gray;
      display: inline-block;
      margin: 0 10px;
    }

    .lcd-display {
      margin-top: 20px;
    }
  </style>
</head>

<body>
  <div class="sensor-data">
    <h1>Arduino Sensor Data</h1>
    <div class="sensor-values">
      <p><strong>Humidity:</strong> <span id="humidity">--</span>%</p>
      <p><strong>Temperature:</strong> <span id="temperature">--
</span>°C</p>
```

```

        <p><strong>Distance (cm):</strong> <span id="distanceCm">--
</span></p>
        <p><strong>Choice:</strong> <span id="choice">--</span></p>
    </div>
    <div class="led-indicators">
        <div class="led" id="led1"></div>
        <div class="led" id="led2"></div>
        <div class="led" id="led3"></div>
    </div>
    <div class="lcd-display">
        <strong>Soil Moisture:</strong> <span id="soilMoisture">--</span>
    </div>
</div>
<script>
    document.addEventListener("DOMContentLoaded", function () {
        function updateSensorData() {
            // Simulate sensor data (replace with actual data)
            let humidity = Math.floor(Math.random() * 71) + 30; // Random
between 30% and 100%
            let temperature = (Math.random() * 11) + 20; // Random between
20°C and 30°C
            let distanceCm = Math.floor(Math.random() * 96) + 5; // Random
between 5 cm and 100 cm
            let choice = Math.floor(Math.random() * 3) + 1; // Random
choice between 1 and 3
            let soilMoisture = Math.floor(Math.random() * 101); // Random
between 0% and 100%

            // Update HTML elements with sensor data
            document.getElementById("humidity").textContent = humidity;
            document.getElementById("temperature").textContent =
temperature.toFixed(2);
            document.getElementById("distanceCm").textContent =
distanceCm;
            document.getElementById("choice").textContent = choice;
            document.getElementById("soilMoisture").textContent =
soilMoisture;

            // Update LED indicators based on the choice
            let led1 = document.getElementById("led1");
            let led2 = document.getElementById("led2");
            let led3 = document.getElementById("led3");
            led1.style.backgroundColor = (choice === 1) ? "green" :
"gray";
            led2.style.backgroundColor = (choice === 2) ? "green" :
"gray";
            led3.style.backgroundColor = (choice === 3) ? "green" :
"gray";
        }
        // Call the function initially and then periodically
        updateSensorData();
        setInterval(updateSensorData, 1000);
    });
</script>

```

```

    }

    // Update sensor data every 2 seconds
    setInterval(updateSensorData, 2000);
  });
</script>
</body>

</html>

```

EQUIVALENT PYTHON CODE:

```
from flask import Flask, render_template
```

```
import random
```

```
import time
```

```
app = Flask(__name__)
```

```
@app.route("/")
```

```
def index():
```

```
    # Simulate sensor data
```

```
    humidity = random.uniform(30, 70)
```

```
    temperature = random.uniform(20, 30)
```

```
    distance_cm = random.uniform(5, 100)
```

```
    soil_moisture = random.randint(0, 100)
```

```
    # Determine choice based on soil moisture
```

```
    if soil_moisture > 70:
```

```
        choice = "Heavy"
```

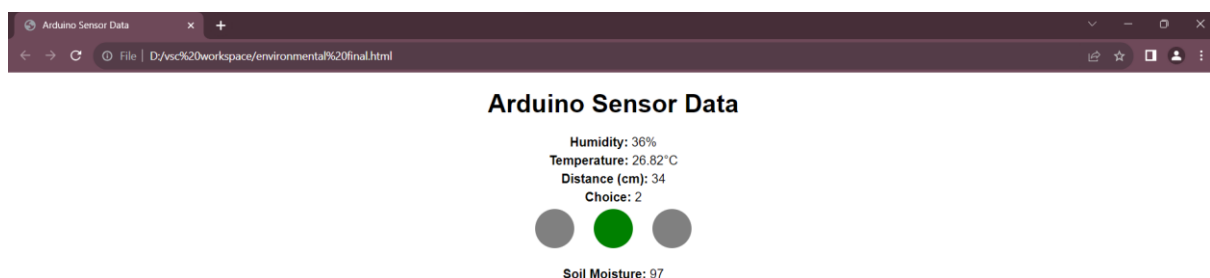
```
elif soil_moisture < 30:
    choice = "Drizzle"
else:
    choice = "Medium"

return render_template('index.html', humidity=humidity,
temperature=temperature, distance_cm=distance_cm,
soil_moisture=soil_moisture, choice=choice)

if __name__ == '__main__':
    app.run(debug=True)
```

Provided to install libraries and pip.

OUTPUT:





Arduino Sensor Data

Humidity: 74%
Temperature: 27.71°C
Distance (cm): 26
Choice: 1



Soil Moisture: 57



Arduino Sensor Data

Humidity: 86%
Temperature: 29.64°C
Distance (cm): 63
Choice: 1



Soil Moisture: 54



Arduino Sensor Data

Humidity: 48%
Temperature: 28.00°C
Distance (cm): 97
Choice: 2



Soil Moisture: 40