IoT Internship Task Report

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Use Case: Smart Agriculture Monitoring System

1. Introduction

This project demonstrates a basic IoT-based Smart Agriculture Monitoring system using simulated sensors and a microcontroller. The goal is to monitor environmental conditions such as soil moisture, temperature, and humidity, and to determine whether irrigation is required.

2. System Components

1. Arduino Uno (simulated microcontroller)
2. DHT22 Temperature and Humidity Sensor (simulated)
3. Potentiometer used as a logical equivalent for a soil moisture sensor
4. Serial Monitor for output display

3. System Architecture

The sensors are connected to the Arduino Uno. Sensor data is processed by embedded logic running on the microcontroller, and the processed information is displayed on the serial monitor.

4. Working Principle

1. Arduino reads soil moisture as an analog value.
2. Temperature and humidity values are read from the DHT22 sensor.
3. The system compares soil moisture against a predefined threshold.
4. If soil moisture is low, irrigation is required; otherwise, the soil condition is adequate.
5. All readings and system status are printed to the serial monitor.

5. Simulation Environment

The system was simulated using the Wokwi online simulator. The potentiometer was adjusted to simulate dry and wet soil conditions, and temperature and humidity values were modified directly from the DHT22 component interface.

Source Code

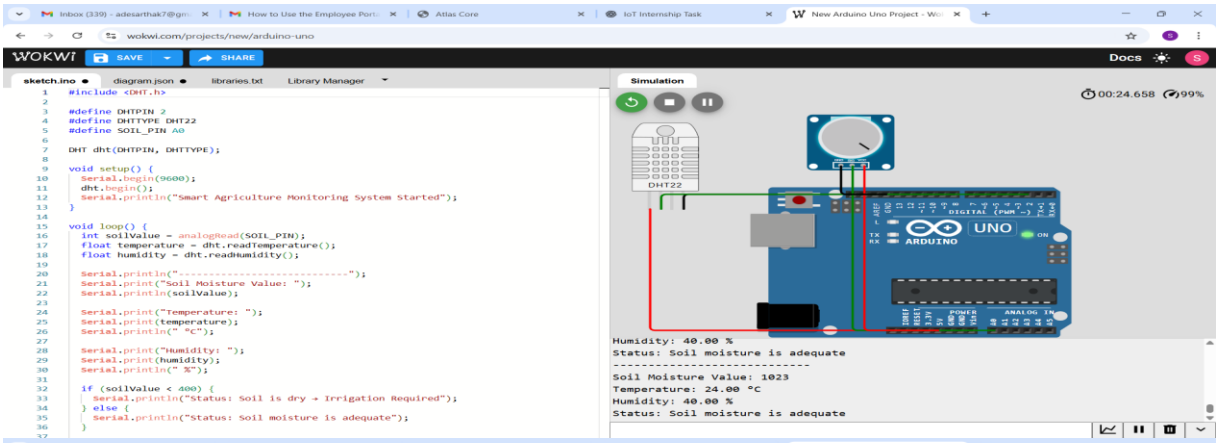
```
#include <DHT.h>

#define DHTPIN 2
#define DHTTYPE DHT22
#define SOIL_PIN A0

DHT dht(DHTPIN, DHTTYPE);

void setup() {
  Serial.begin(9600);
  dht.begin();
  Serial.println("Smart Agriculture Monitoring System Started");
}
 void loop() {
  int soilValue = analogRead(SOIL_PIN);
  float temperature = dht.readTemperature();
  float humidity = dht.readHumidity();
  Serial.println("----------------------------");
  Serial.print("Soil Moisture Value: ");
  Serial.println(soilValue);
  Serial.print("Temperature: ");
  Serial.print(temperature);
  Serial.println(" °C");
  Serial.print("Humidity: ");
  Serial.print(humidity);
  Serial.println(" %");

 if (soilValue < 400) {
    Serial.println("Status: Soil is dry → Irrigation Required");
  } else {
    Serial.println("Status: Soil moisture is adequate");
  }
  delay(2000);
}
```

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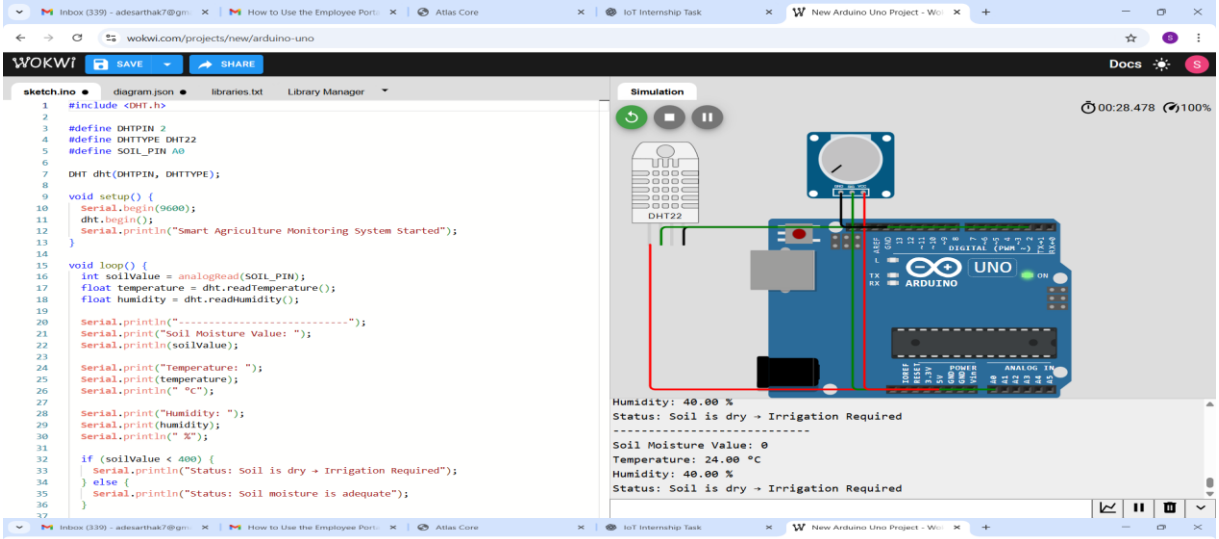


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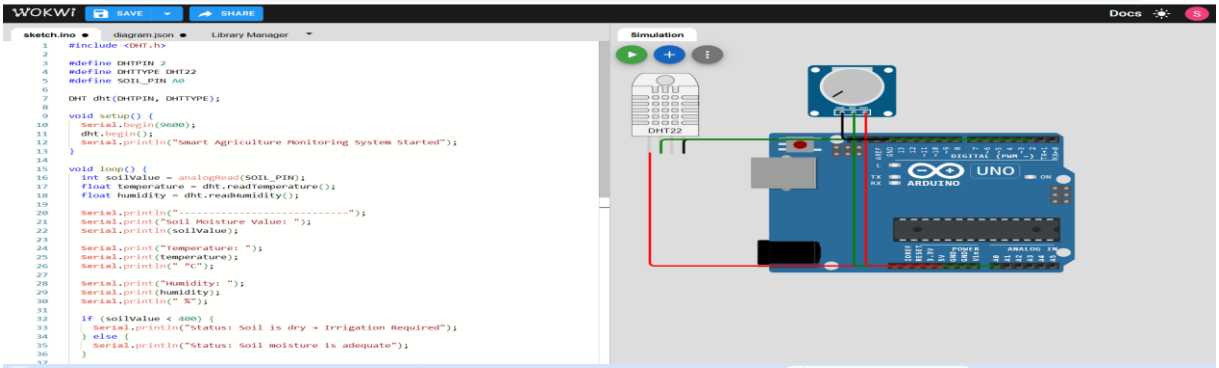


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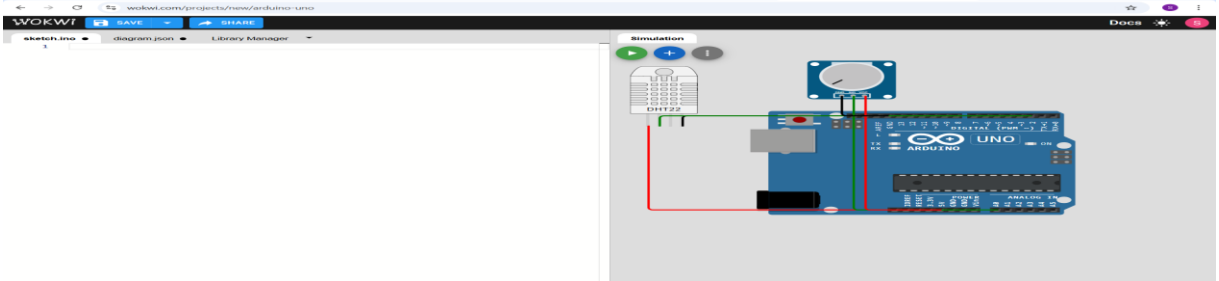

6. Results and Output

The simulation successfully demonstrated dynamic sensor readings and correct decision-making logic. The serial monitor displayed real-time data along with irrigation status messages based on soil moisture levels. Potentiometer was used to logically simulate soil moisture variations in absence of physical sensors.

7. Conclusion

This project illustrates a simple yet effective IoT prototype suitable for early-stage development. It reinforces fundamental concepts such as sensor interfacing, analog data processing, and embedded decision logic.