#include <Wire.h>

#include <LiquidCrystal\_I2C.h>

#include "DHT.h"

LiquidCrystal\_I2C lcd(0x27, 16, 2);

#define DPIN 4

#define DTYPE DHT11

DHT dht(DPIN, DTYPE);

#define SENSOR\_PIN A0

#define PIR D5

int PIR\_ToggleValue = 0;

void setup() {

Serial.begin(9600);

Wire.begin();

lcd.begin(16, 2);

lcd.backlight();

pinMode(SENSOR\_PIN, INPUT);

pinMode(PIR, INPUT);

pinMode(LED\_BUILTIN, OUTPUT);

digitalWrite(LED\_BUILTIN, HIGH);

dht.begin();

lcd.setCursor(0, 0);

lcd.print(" Initializing ");

for (int a = 5; a <= 10; a++) {

lcd.setCursor(a, 1);

lcd.print(".");

delay(500);}

lcd.clear();

lcd.setCursor(0, 1);

lcd.print("M:OFF");}

void DHT11sensor() {

delay(2000);

float tc = dht.readTemperature(false);

float tf = dht.readTemperature(true);

float hu = dht.readHumidity();

if (isnan(tc) || isnan(hu)) {

Serial.println("Failed to read from DHT sensor!");

lcd.setCursor(0, 0);

lcd.print("DHT Error!");

return;}

Serial.print("Temp: ");

Serial.print(tc);

Serial.print(" C, ");

Serial.print(tf);

Serial.print(" F, Hum: ");

Serial.print(hu);

Serial.println("%");

lcd.setCursor(0, 0);

lcd.print("T:");

lcd.print(tc);

lcd.print("C ");

lcd.setCursor(8, 0);

lcd.print("H:");

lcd.print(hu);

lcd.print("%");}

void soilMoistureSensor() {

int sensorValue = analogRead(SENSOR\_PIN);

int moisturePercentage = map(sensorValue, 0, 1023, 0, 100);

Serial.print("Raw Sensor Value: ");

Serial.print(sensorValue);

Serial.print(" | Moisture Percentage: ");

Serial.print(moisturePercentage);

Serial.print("% | ");

if (moisturePercentage < 30) {

Serial.println("Soil is Dry");

//lcd.clear();

lcd.setCursor(5, 1);

lcd.print("Dry Soil");

} else if (moisturePercentage < 70) {

Serial.println("Soil is Normal");

//lcd.clear();

lcd.setCursor(5, 1);

lcd.print("Wet Soil");

} else { Serial.println("Normal Soil");

lcd.setCursor(5, 1);

lcd.print("Normal Soil"); }

delay(1000); }

unsigned long currentTime;

const unsigned long motionCheckInterval = 150UL;

unsigned long previousMotionCheckTime = 0;

void PIRsensor() {

delay(1500);

int motionSensor= D5;

currentTime = millis();

if (currentTime - previousMotionCheckTime >= motionCheckInterval) {

int isMotionDetected = digitalRead(motionSensor);

if (isMotionDetected == 0) {

Serial.println("Motion ended!");

lcd.print("No motion");

;

} else {

Serial.println("Motion detected!");

lcd.print("Motion");

}

previousMotionCheckTime = currentTime;

}

}

void loop() {

if (PIR\_ToggleValue == 1) {

PIRsensor();

}

DHT11sensor();

soilMoistureSensor();

delay(500); // Delay to prevent rapid looping

}