CODE:

#include <ESP8266WiFi.h>

#include <Firebase\_ESP\_Client.h>

#include "addons/TokenHelper.h"

#include "addons/RTDBHelper.h"

#include <DHT.h>

#define WIFI\_SSID "123456789"

#define WIFI\_PASSWORD "123456789"

#define API\_KEY "AIzaSyC0gPSHesz3RxIsbFM48OkKK\_zCBhfbtmc"

#define DATABASE\_URL "https://test-26075-default-rtdb.firebaseio.com/"

FirebaseData fbdo;

FirebaseAuth auth;

FirebaseConfig config;

unsigned long sendDataPrevMillis = 0;

bool signupOK = false;

#define DHTPIN D4 // Digital pin connected to the DHT sensor

#define DHTTYPE DHT11 // DHT 11

#define IRPIN D2 // Digital pin connected to the IR sensor

#define MQ4PIN A0 // Analog pin connected to the MQ-4 sensor

#define RED\_LED\_PIN D5 // Digital pin connected to the red LED

#define GREEN\_LED\_PIN D6 // Digital pin connected to the green LED

DHT dht(DHTPIN, DHTTYPE);

float temperatureThreshold = 35.0; // Temperature threshold in Celsius

float humidityThreshold = 70.0; // Humidity threshold in percentage

void setup() {

Serial.begin(115200);

dht.begin();

pinMode(IRPIN, INPUT);

pinMode(RED\_LED\_PIN, OUTPUT);

pinMode(GREEN\_LED\_PIN, OUTPUT);

WiFi.begin(WIFI\_SSID, WIFI\_PASSWORD);

Serial.print("Connecting to Wi-Fi");

while (WiFi.status() != WL\_CONNECTED) {

Serial.print(".");

delay(300);

}

Serial.println();

Serial.print("Connected with IP: ");

Serial.println(WiFi.localIP());

// Configure Firebase

config.api\_key = API\_KEY;

config.database\_url = DATABASE\_URL;

if (Firebase.signUp(&config, &auth, "", "")){

Serial.println("Firebase authentication successful");

signupOK = true;

}

else{

Serial.printf("Firebase signup error: %s\n", config.signer.signupError.message.c\_str());

}

Firebase.begin(&config, &auth);

Firebase.reconnectWiFi(true);

}

void loop() {

delay(2000); // Wait for 2 seconds between measurements

int irValue = digitalRead(IRPIN);

int mq4Value = analogRead(MQ4PIN);

float humidity = dht.readHumidity();

float temperature = dht.readTemperature();

if (isnan(humidity) || isnan(temperature)) {

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

return;

}

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

Serial.println(irValue);

Serial.print("MQ-4 Sensor Value: ");

Serial.println(mq4Value);

Serial.print("Humidity: ");

Serial.print(humidity);

Serial.print("% Temperature: ");

Serial.print(temperature);

Serial.println("°C");

// Check if the temperature or humidity exceeds the threshold

if (temperature > temperatureThreshold || humidity > humidityThreshold || irValue == HIGH || mq4Value > 200) {

Serial.println("Food might be spoiled! Take necessary actions.");

digitalWrite(RED\_LED\_PIN, HIGH); // Turn on the red LED

digitalWrite(GREEN\_LED\_PIN, LOW); // Turn off the green LED

} else {

Serial.println("Food is safe.");

digitalWrite(RED\_LED\_PIN, LOW); // Turn off the red LED

digitalWrite(GREEN\_LED\_PIN, HIGH); // Turn on the green LED

}

if (Firebase.ready() && signupOK && (millis() - sendDataPrevMillis > 1000 || sendDataPrevMillis == 0)){

sendDataPrevMillis = millis();

if (Firebase.RTDB.setInt(&fbdo, "main/irValue", irValue)){

Serial.println("irValue data sent to Firebase");

Serial.println("PATH: " + fbdo.dataPath());

Serial.println("TYPE: " + fbdo.dataType());

}

else {

Serial.println("Failed to send irValue data to Firebase"+ fbdo.errorReason());

}

if (Firebase.RTDB.setFloat(&fbdo, "main/temperature", temperature)){

Serial.println("temperature data sent to Firebase");

Serial.println("PATH: " + fbdo.dataPath());

Serial.println("TYPE: " + fbdo.dataType());

}

else {

Serial.println("Failed to send temperature data to Firebase"+ fbdo.errorReason());

}

if (Firebase.RTDB.setFloat(&fbdo, "main/humidity", humidity)){

Serial.println("humidity data sent to Firebase");

Serial.println("PATH: " + fbdo.dataPath());

Serial.println("TYPE: " + fbdo.dataType());

}

else {

Serial.println("Failed to send humidity data to Firebase"+ fbdo.errorReason());

}

if (Firebase.RTDB.setFloat(&fbdo, "main/mq4Value", mq4Value)){

Serial.println("mq4Value data sent to Firebase");

Serial.println("PATH: " + fbdo.dataPath());

Serial.println("TYPE: " + fbdo.dataType());

}

else {

Serial.println("Failed to send mq4Value data to Firebase"+ fbdo.errorReason());

}

}

}