IBM NALAIYATHIRAN

SMART FARMER-IOT ENABLED SMART FARMING APPLICATION

ASSIGNMENT -4

Title	Smart farmer-IoT enabled smart farming application
Domain	Internet of Things
Team ID	PNT2022TMID44170
Project Name	Project – Smart Farmer-IoT Enabled smartFarming Application

Question:

Write code and connections in wokwi for the ultrasonic sensor. Whenever the distance is less than 100 cms send an "alert" to the IBM cloud and display in the device recent events. Upload document with wokwi share link and images of IBM cloud

CODE :

```
#include <WiFi.h>
#include <PubSubClient.h> void callback(char* subscribetopic, byte* payload,
unsigned int payloadLength);
#define ORG "48uqbr"
#define DEVICE_TYPE
"hasnarahah1009" #define
DEVICE_ID "hasna09"
#define TOKEN "BMqqN8HR9t9" String data3; char server[]
= ORG ".messaging.internetofthings.ibmcloud.com"; char
publishTopic[] = "iot-2/evt/Data/fmt/json"; char
subscribetopic[]
= "iot-2/cmd/test/fmt/String"; char authMethod[] = "use-token-
auth"; char token[] = TOKEN; char clientId[] = "d:"  ORG ":"
DEVICE_TYPE ":" DEVICE_ID;
WiFiClient wifiClient;
PubSubClient client(server, 1883,
callback,wifiClient); const int trigPin = 5; const int
echoPin = 18; #define SOUND_SPEED 0.034 long
duration; float distance; void setup() {
Serial.begin(115200); pinMode(trigPin, OUTPUT);
```

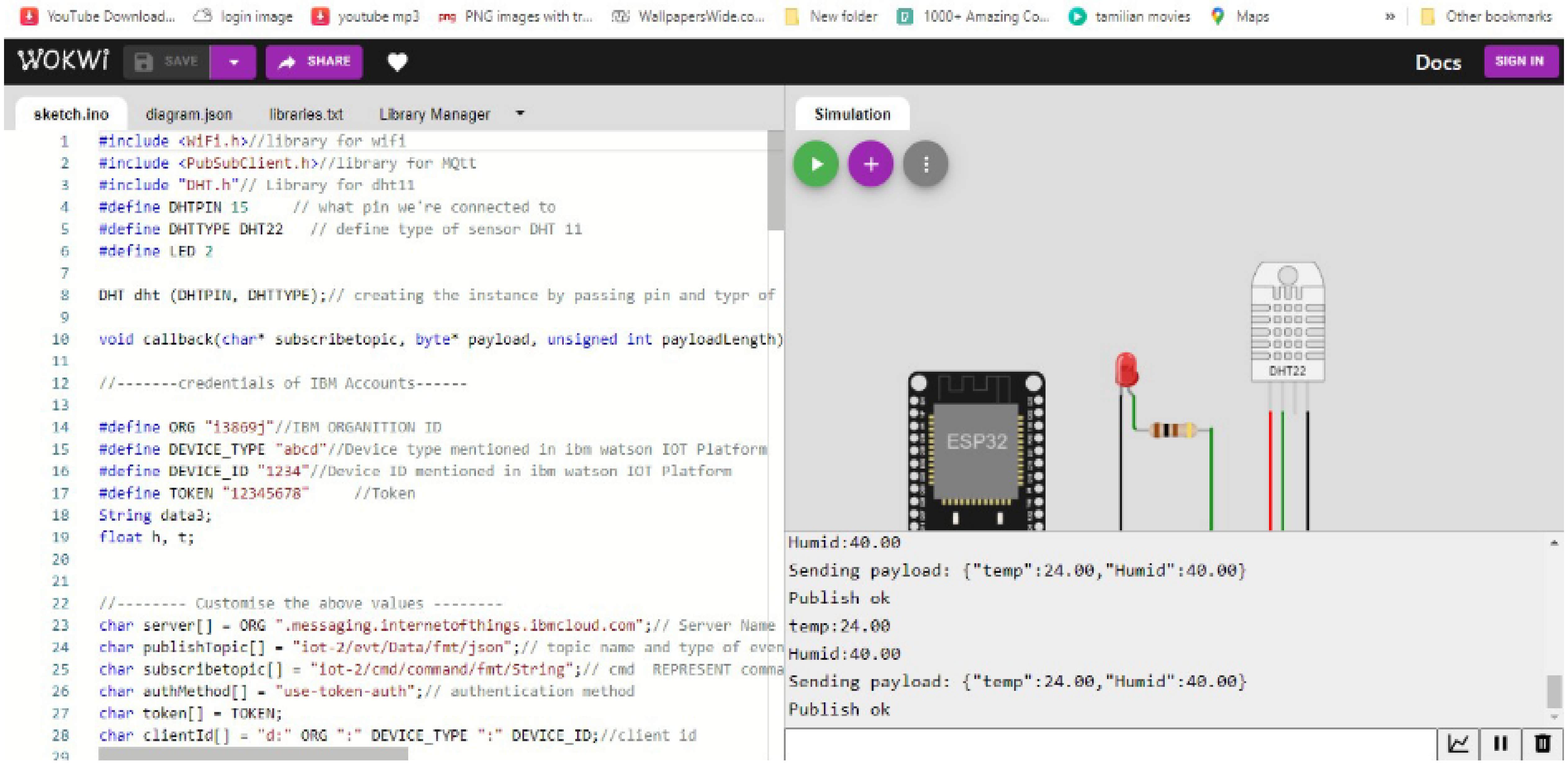
```
pinMode(echoPin, INPUT); wificonnect();
mqttconnect();
}
void loop() {
digitalWrite(trigPin, LOW);
delayMicroseconds(2);
digitalWrite(trigPin, HIGH);
delayMicroseconds(10);
digitalWrite(trigPin, LOW); duration
= pulseIn(echoPin, HIGH); distance
= duration * SOUND_SPEED/2;
Serial.print("Distance (cm): ");
Serial.println(distance);
if(distance<100)
{
Serial.println("ALERT!!");
delay(1000);
PublishData(distance);
delay(1000); if
(!client.loop()) {
mqttconnect();
}}
delay(1000)
;}
void PublishData(float dist) { mqttconnect();
String payload = "{\"Distance\":"; payload += dist; payload
+= ",\"ALERT!!\":""\"Distance less than
100cms\"";payload += "}";
Serial.print("Sending payload: ");
Serial.println(payload);

if (client.publish(publishTopic, (char*) payload.c_str())) {
Serial.println("Publish ok");
} else {
Serial.println("Publish failed");
}}
void mqttconnect() { if
(!client.connected()) {
Serial.print("Reconnecting client to
");Serial.println(server);
while (!!!client.connect(clientId, authMethod, token)) {
Serial.print("."); delay(500);
}
initManagedDevice();
Serial.println();
}}
```

```
void wificonnect()
{
Serial.println();
Serial.print("Connecting to "); WiFi.begin("Wokwi-GUEST", "", 6); while (WiFi.status() !=
WL_CONNECTED) { delay(500); Serial.print(".");
}
Serial.println("");
Serial.println("WiFi connected");
Serial.println("IP address: ");
Serial.println(WiFi.localIP());
}
void initManagedDevice() {
if (client.subscribe(subscribetopic)) {
Serial.println((subscribetopic));Serial.println("subscribe to cmd
OK");
} else {
Serial.println("subscribe to cmd FAILED");
} }
void callback(char* subscribetopic, byte* payload, unsigned int payloadLength)
{
Serial.print("callback invoked for topic: ");
Serial.println(subscribetopic); for (int i = 0; i
< payloadLength; i++)
{
data3 += (char)payload[i];
}
Serial.println("data: "+ data3); data3="";
}
```

Wokwi Link :

https://wokwi.com/projects/345395196387656275675

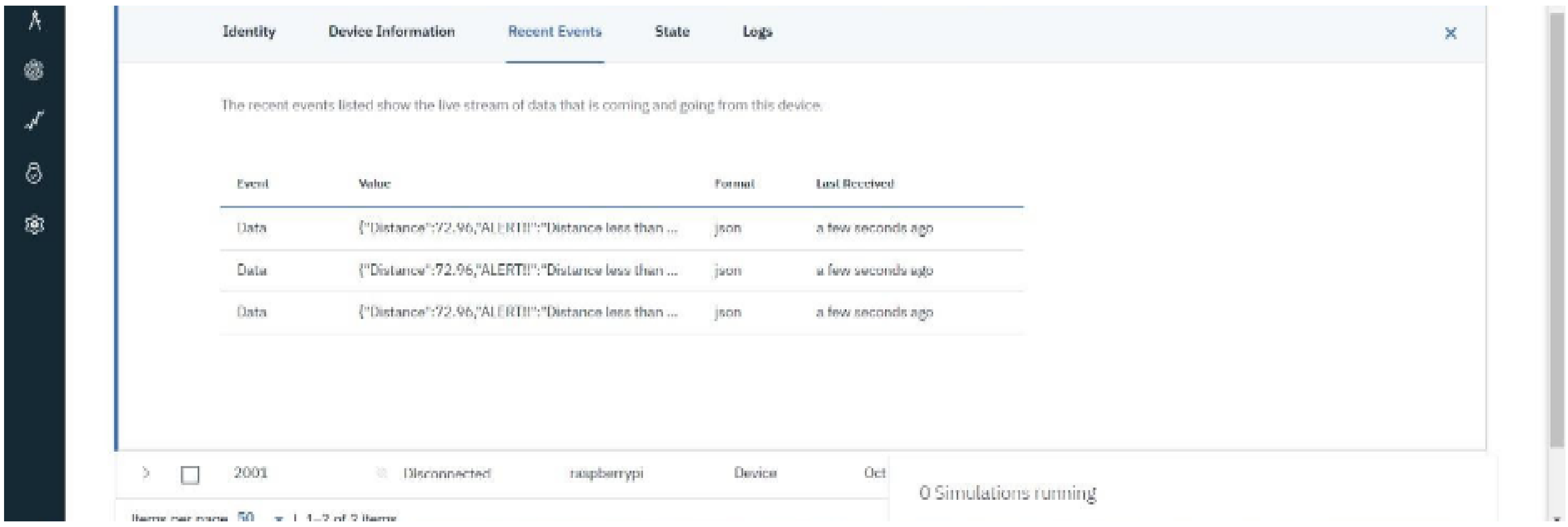
Output and Simulation :



```
#include <WiFi.h>//library for wifi
#include <PubSubClient.h>//library for MQtt
#include "DHT.h"// Library for dht11
#define DHTPIN 15     // what pin we're connected to
#define DHTTYPE DHT22   // define type of sensor DHT 11
#define LED 2

DHT dht (DHTPIN, DHTTYPE);// creating the instance by passing pin and typr of

void callback(char* subscribetopic, byte* payload, unsigned int payloadLength)

//-------credentials of IBM Accounts------

#define ORG "i3869j"//IBM ORGANITION ID
#define DEVICE_TYPE "abcd"//Device type mentioned in ibm watson IOT Platform
#define DEVICE_ID "1234"//Device ID mentioned in ibm watson IOT Platform
#define TOKEN "12345678"     //Token
String data3;
float h, t;


//-------- Customise the above values --------
char server[] = ORG ".messaging.internetofthings.ibmcloud.com";// Server Name
char publishTopic[] = "iot-2/evt/Data/fmt/json";// topic name and type of even
char subscribetopic[] = "iot-2/cmd/command/fmt/String";// cmd  REPRESENT comma
char authMethod[] = "use-token-auth";// authentication method
char token[] = TOKEN;
char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;//client id
```

```
Humid:40.00
Sending payload: {"temp":24.00,"Humid":40.00}
Publish ok
temp:24.00
Humid:40.00
Sending payload: {"temp":24.00,"Humid":40.00}
Publish ok
```

Whenever the distance is less than 100 cms send an "alert" to the IBM cloud and display in the device recent events.



The recent events listed show the live stream of data that is coming and going from this device.

Event	Value	Format	Last Received
Data	{"Distance":72.96,"ALERT!!":"Distance less than ...	json	a few seconds ago
Data	{"Distance":72.96,"ALERT!!":"Distance less than ...	json	a few seconds ago
Data	{"Distance":72.96,"ALERT!!":"Distance less than ...	json	a few seconds ago

>	□	2001	Disconnected	raspberrypi	Device	Oct

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0 Simulations running