MUTHAYAMMAL ENGINEERING COLLEGE

Department of Electronics and Communication Engineering

Smart Farmer-IOT Enabled Smart Farming Application

Assignment -4

TEAM ID : PNT2022TMID19105

Question-1:

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

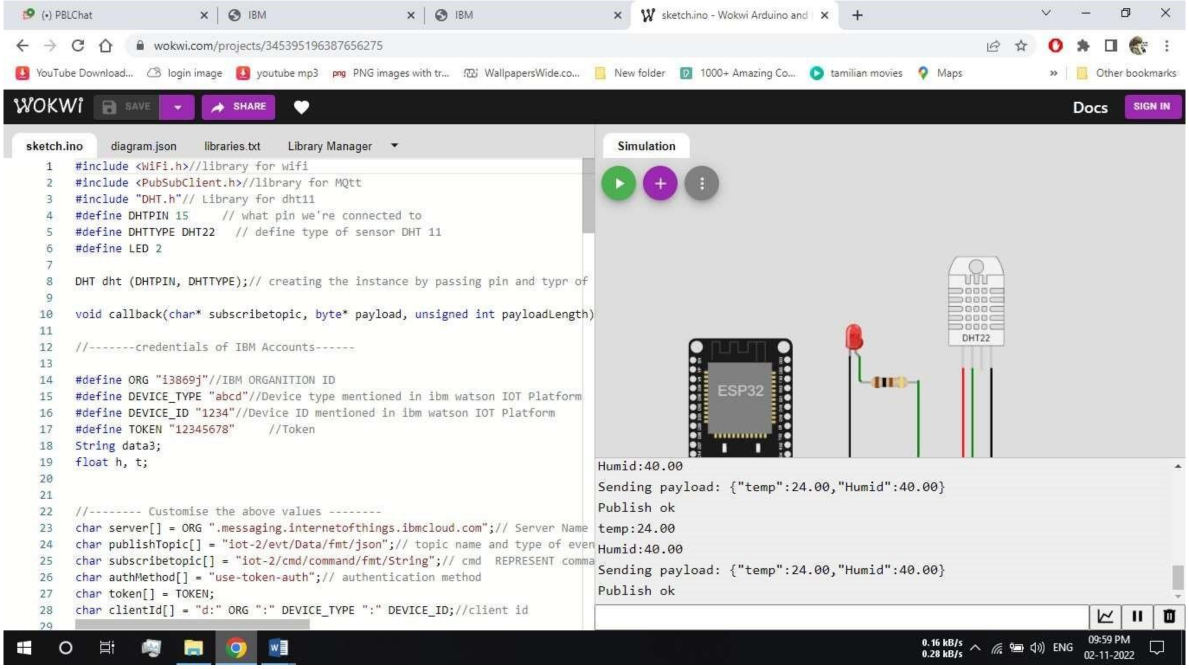
CODE :

```
#include <WiFi.h>
#include <PubSubClient.h> void callback(char* subscribetopic, byte* payload,
unsigned int payloadLength);
#define ORG "92zbfc"
#define DEVICE_TYPE "esp32"
#define DEVICE_ID "12345"
#define TOKEN "12345678" 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/345395196387656275

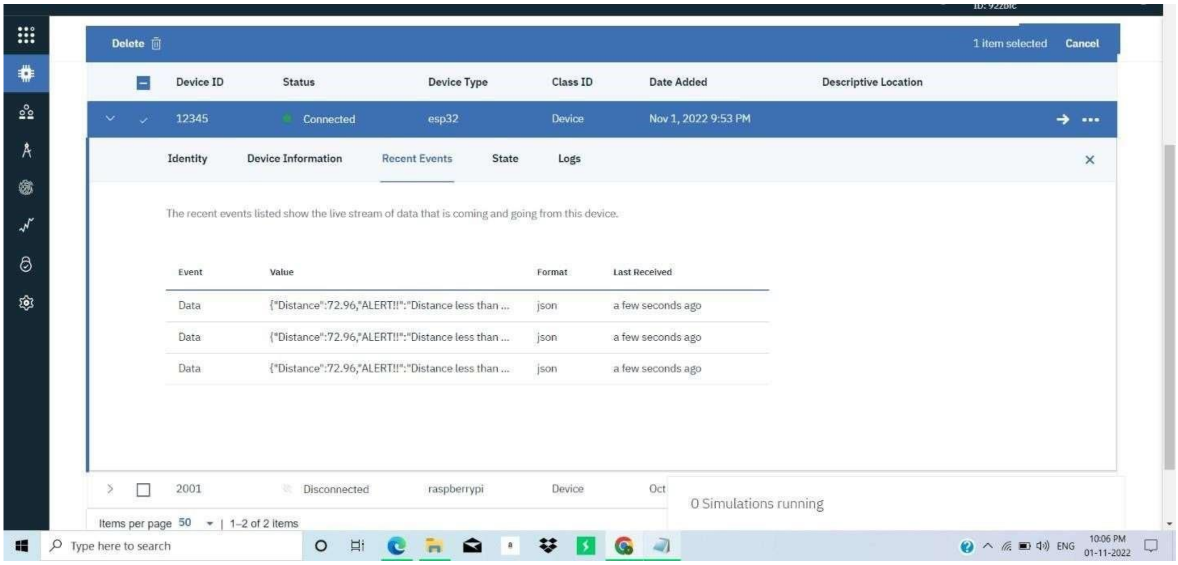
Output and Simulation :



```
#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.



Device ID	Status	Device Type	Class ID	Date Added	Descriptive Location
12345	Connected	esp32	Device	Nov 1, 2022 9:53 PM	
2001	Disconnected	raspberrypi	Device	Oct	

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