

ASSIGNMENT 4

Date	17 November 2022
Team ID	PNT2022TMID38324
Project Name	Gas Leakage Monitoring & Alerting System for Industries

QUESTION :

Write code and connection in wokwi for ultrasonic sensor. Whenever distance is less than 100 cms send “alert” to IBM cloud and display in device recent events

CODE :

```
#include <WiFi.h> //library for wifi
#include <PubSubClient.h> //library for MQTT
WiFiClient wifiClient;
String data3;
#define ORG "hkrttd0"
#define DEVICE_TYPE "Priyadharshini"
#define DEVICE_ID "Priya_Assignment_4"
#define TOKEN "12345678"
#define speed 0.034
#define led 14
char server[] = ORG ".messaging.internetofthings.ibmcloud.com";

char publishTopic[] = "iot-2/evt/Priya_Assignment_4/fmt/json";
char topic[] = "iot-2/cmd/status/fmt/String";
char authMethod[] = "use-token-auth";
char token[] = TOKEN;
char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;
PubSubClient client(server, 1883, wifiClient);

const int trigpin=19;
const int echopin=18;
```

```

String command;
String data="";
long duration;
float dist;

void setup()
{
  Serial.begin(115200);
  pinMode(led, OUTPUT);
  pinMode(trigpin, OUTPUT);
  pinMode(echopin, INPUT);
  wifiConnect();
  mqttConnect();
}
void loop()
{

  bool isNearby = dist < 100;
  digitalWrite(led, isNearby);
  publishData();
  delay(500);
  if (!client.loop())
  {
    mqttConnect();
  }
}
void wifiConnect()
{
  Serial.print("Connecting to "); Serial.print("Wifi");
  WiFi.begin("Wokwi-GUEST", "", 6);
  while (WiFi.status() != WL_CONNECTED)
  {
    delay(500);
    Serial.print(".");
  }
  Serial.print("WiFi connected, IP address: "); Serial.println(WiFi.localIP());
}
void mqttConnect()
{
  if (!client.connected())
  {
    Serial.print("Reconnecting MQTT client to "); Serial.println(server);
    while (!client.connect(clientId, authMethod, token))
    {

      Serial.print(".");
      delay(500);
    }
  }
}

```

```

initManagedDevice();
Serial.println();
}
}
void initManagedDevice() {
if (client.subscribe(topic))
{
// Serial.println(client.subscribe(topic));
Serial.println("IBM subscribe to cmd OK");
}
else
{
Serial.println("subscribe to cmd FAILED");
}
}
void publishData()
{
digitalWrite(trigpin, LOW);
digitalWrite(trigpin, HIGH);
delayMicroseconds(10);
digitalWrite(trigpin, LOW);
duration=pulseIn(echopin, HIGH);
dist=duration*speed/2;
if(dist<100)
{
String payload = "{\"Alert Distance\":\"";
payload += dist;

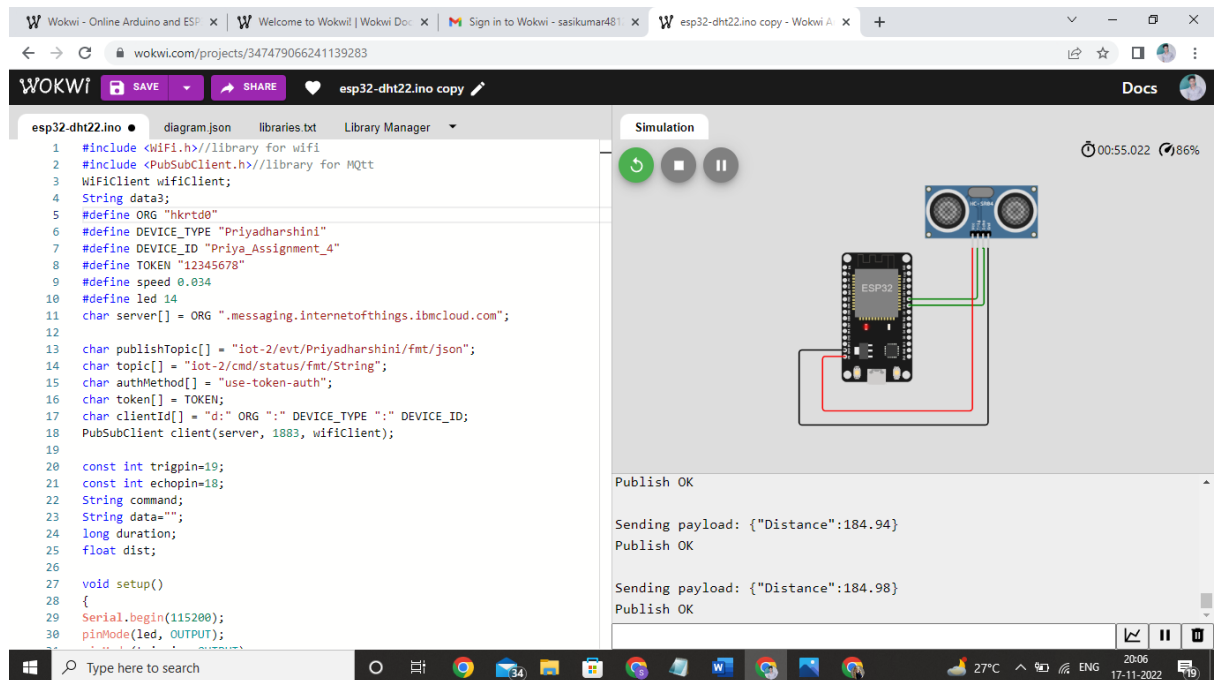
payload += "}";
Serial.print("\n");
Serial.print("Sending payload: ");
Serial.println(payload);
if (client.publish(publishTopic, (char*) payload.c_str()))
{
Serial.println("Publish OK");
}
}
if(dist>100){
String payload = "{\"Distance\":\"";
payload += dist;
payload += "}";
Serial.print("\n");
Serial.print("Sending payload: ");
Serial.println(payload);
if(client.publish(publishTopic, (char*) payload.c_str()))
{
Serial.println("Publish OK");
}
}
}

```

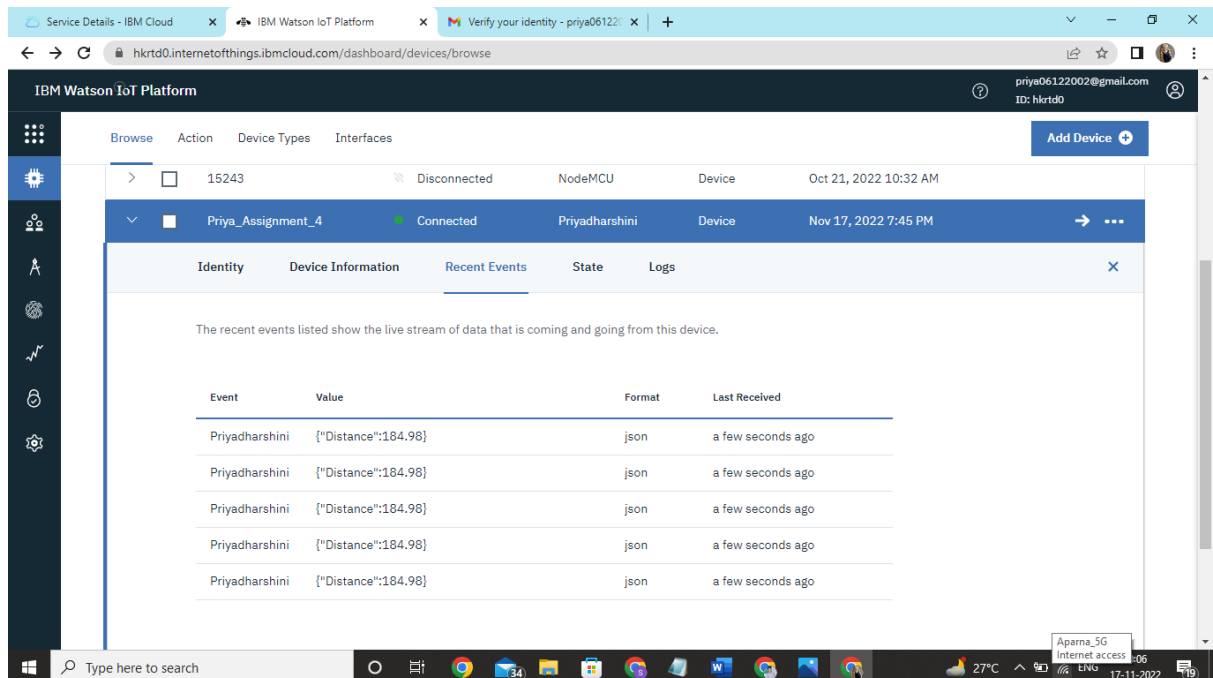
```
else
{
Serial.println("Publish FAILED");
}
}
}
```

OUTPUT :

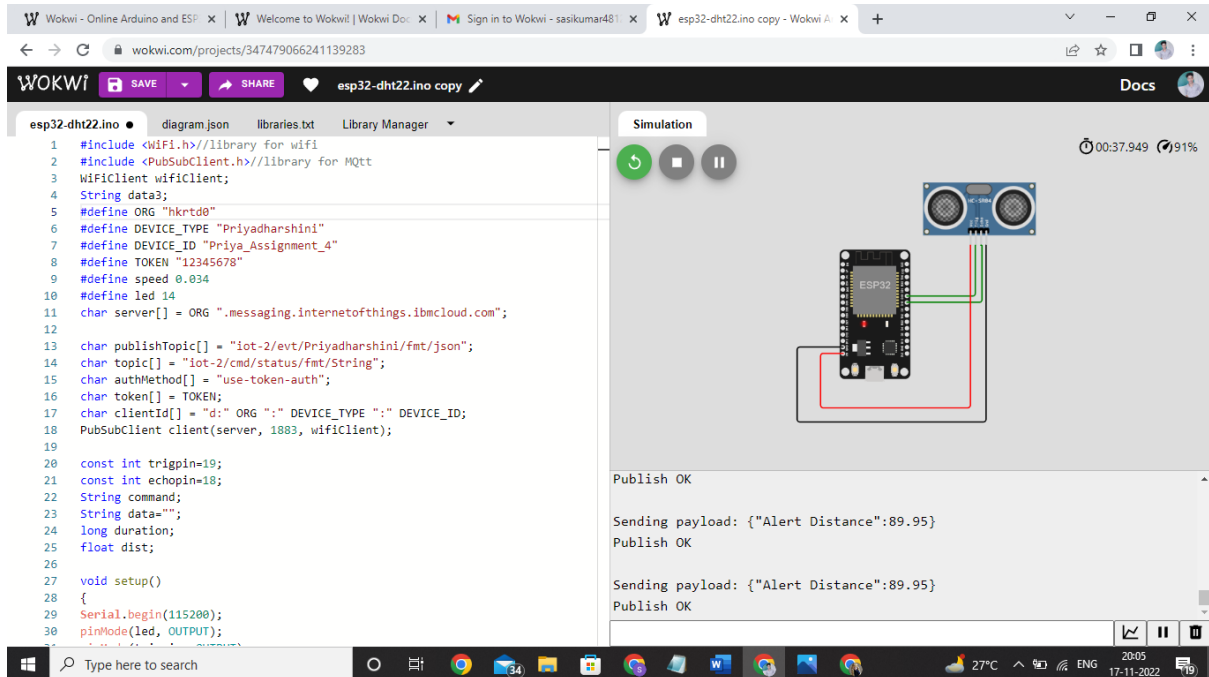
1) When Distance greater than 100 cm



❖ IBM RECENT EVENTS



2) When distance less than 100



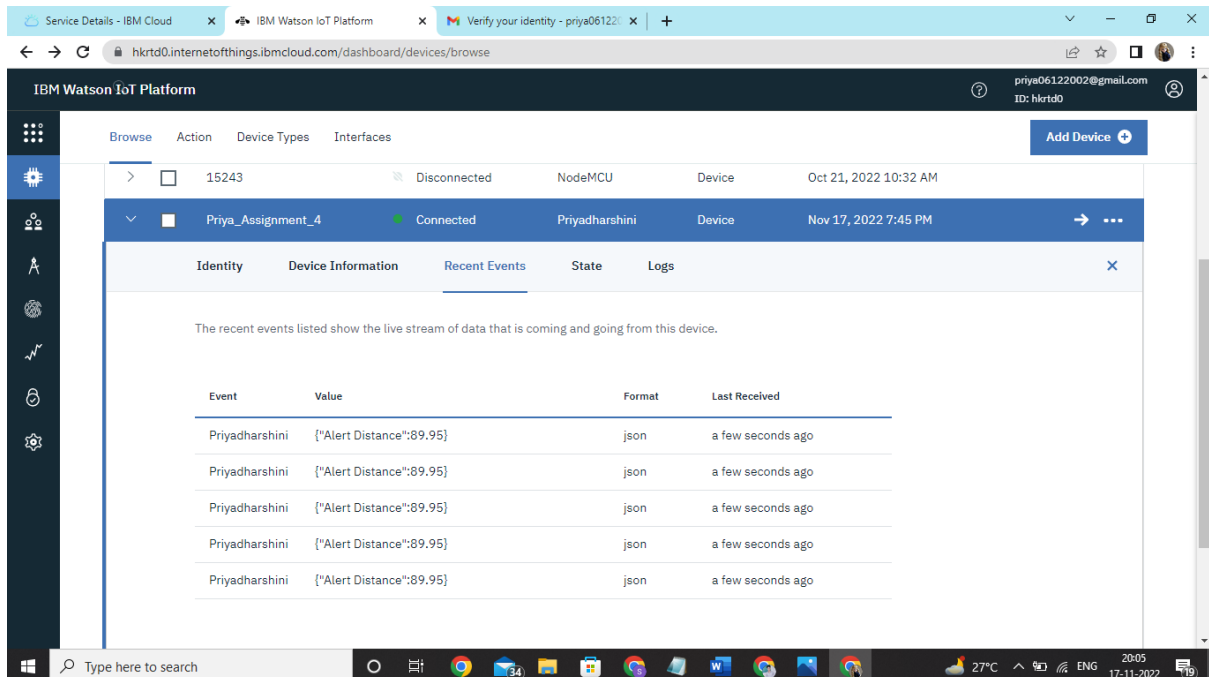
The screenshot shows the Wokwi online Arduino IDE interface. On the left, the code for `esp32-dht22.ino` is displayed, which includes libraries for WiFi and MQTT, defines device and token information, and sets up an MQTT client to publish distance data. The right side shows a simulation of the ESP32 hardware connected to a DHT22 sensor. The console output indicates two successful publish operations with the payload `{"Alert Distance":89.95}`.

```
1 #include <WiFi.h> //library for wifi
2 #include <PubSubClient.h> //library for MQTT
3 WiFiClient wifiClient;
4 String data3;
5 #define ORG "hkrt0"
6 #define DEVICE_TYPE "Priyadharshini"
7 #define DEVICE_ID "Priya_Assignment_4"
8 #define TOKEN "12345678"
9 #define speed 0.034
10 #define led 14
11 char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
12
13 char publishTopic[] = "iot-2/evt/Priyadharshini/fmt/json";
14 char topic[] = "iot-2/cmd/status/fmt/String";
15 char authMethod[] = "use-token-auth";
16 char token[] = TOKEN;
17 char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;
18 PubSubClient client(server, 1883, wifiClient);
19
20 const int trigpin=19;
21 const int echopin=18;
22 String command;
23 String data="";
24 long duration;
25 float dist;
26
27 void setup()
28 {
29   Serial.begin(115200);
30   pinMode(led, OUTPUT);
```

Simulation console output:

```
Publish OK
Sending payload: {"Alert Distance":89.95}
Publish OK
Sending payload: {"Alert Distance":89.95}
Publish OK
```

❖ IBM RECENT EVENTS



The screenshot shows the IBM Watson IoT Platform dashboard. The 'Recent Events' tab is selected for the device `Priya_Assignment_4`. The table below displays the live stream of data events.

Event	Value	Format	Last Received
Priyadharshini	<code>{"Alert Distance":89.95}</code>	json	a few seconds ago
Priyadharshini	<code>{"Alert Distance":89.95}</code>	json	a few seconds ago
Priyadharshini	<code>{"Alert Distance":89.95}</code>	json	a few seconds ago
Priyadharshini	<code>{"Alert Distance":89.95}</code>	json	a few seconds ago
Priyadharshini	<code>{"Alert Distance":89.95}</code>	json	a few seconds ago

