

ASSIGNMENT 4

Date	6 nov 2022
Team ID	PNT2022TMID26079
Project Name	Gas Leakage Monitoring and Alerting System
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Write code and connections in wokwi for ultrasonic sensor. Whenever distance is less than 100 cms send alert to ibm cloud and display in device recent events. Upload document with wokwi share link and images of ibmcloud.

CODE:

```
#include <WiFi.h>
#include <PubSubClient.h>
WiFiClient wifiClient;
String data3;
#define ORG "9djwz2"//IBM ORGANITION ID
#define DEVICE_TYPE "sanjay"//Device type mentioned in ibm watson IOT Platform
#define DEVICE_ID "1234567"//Device ID mentioned in ibm watson IOT Platform
#define TOKEN "12345678"
#define speed 0.034
#define led 14
char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
char publishTopic[] = "iot-2/evt/event_1/fmt/json";
char topic[] = "iot-2/cmd/led/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=5;
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");
}

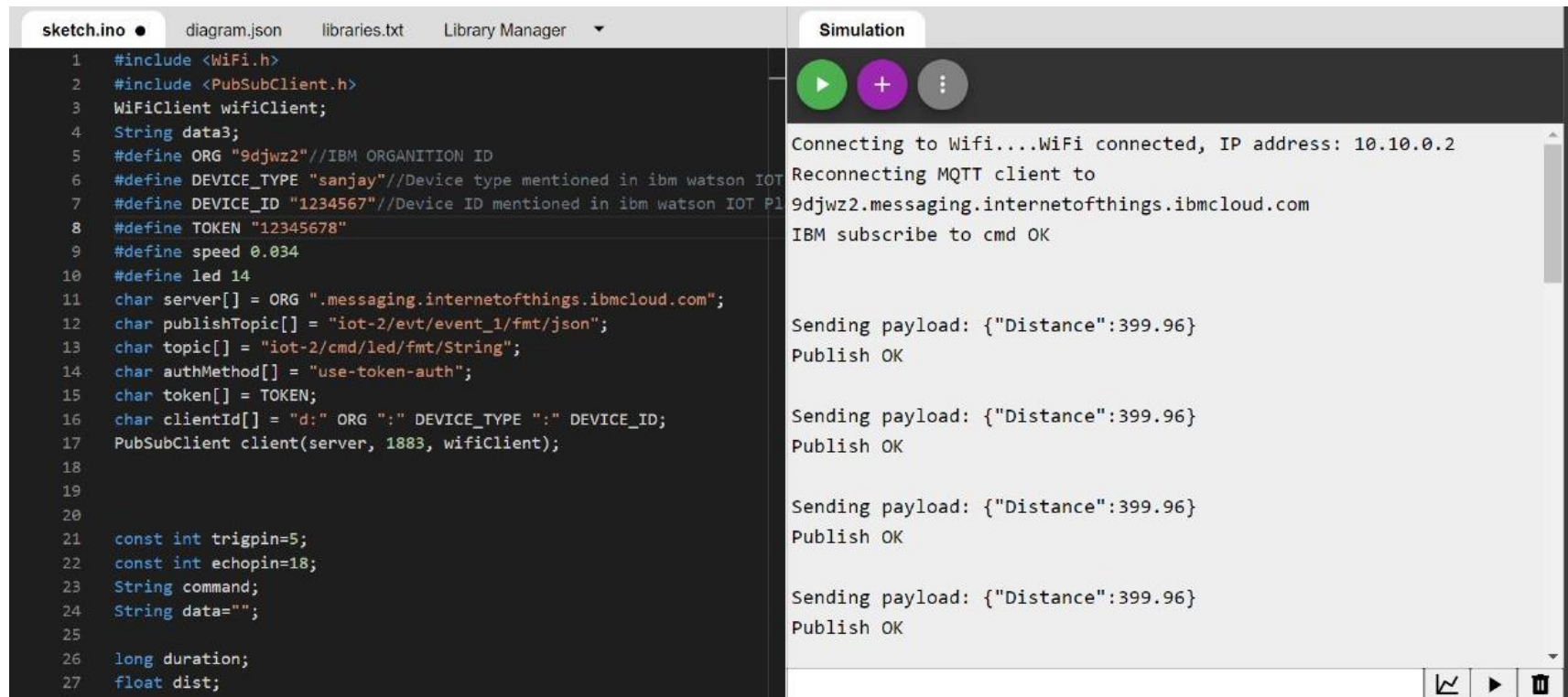
}

}
```

Wokwi link:

<https://wokwi.com/projects/347956062652990036>

output:



The screenshot displays the Wokwi IDE interface. On the left, the 'sketch.ino' file is open, showing a C++ program that configures an MQTT client to connect to IBM Watson IoT Platform and publish distance data. The code includes headers for WiFi and PubSubClient, defines connection parameters like ORG, DEVICE_TYPE, DEVICE_ID, and TOKEN, and sets up an MQTT client. It also defines a trigpin and echopin for an ultrasonic sensor, and declares variables for command, data, duration, and distance.

```
1 #include <WiFi.h>
2 #include <PubSubClient.h>
3 WiFiClient wifiClient;
4 String data3;
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10 #define led 14
11 char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
12 char publishTopic[] = "iot-2/evt/event_1/fmt/json";
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14 char authMethod[] = "use-token-auth";
15 char token[] = TOKEN;
16 char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;
17 PubSubClient client(server, 1883, wifiClient);
18
19
20
21 const int trigpin=5;
22 const int echopin=18;
23 String command;
24 String data="";
25
26 long duration;
27 float dist;
```

On the right, the 'Simulation' tab is active, showing the execution log. The log indicates successful WiFi connection, MQTT client reconnection, and successful subscription to the command topic. It then shows three consecutive successful publishes of a JSON payload containing distance data.

Connecting to Wifi...WiFi connected, IP address: 10.10.0.2
Reconnecting MQTT client to
9djwz2.messaging.internetofthings.ibmcloud.com
IBM subscribe to cmd OK

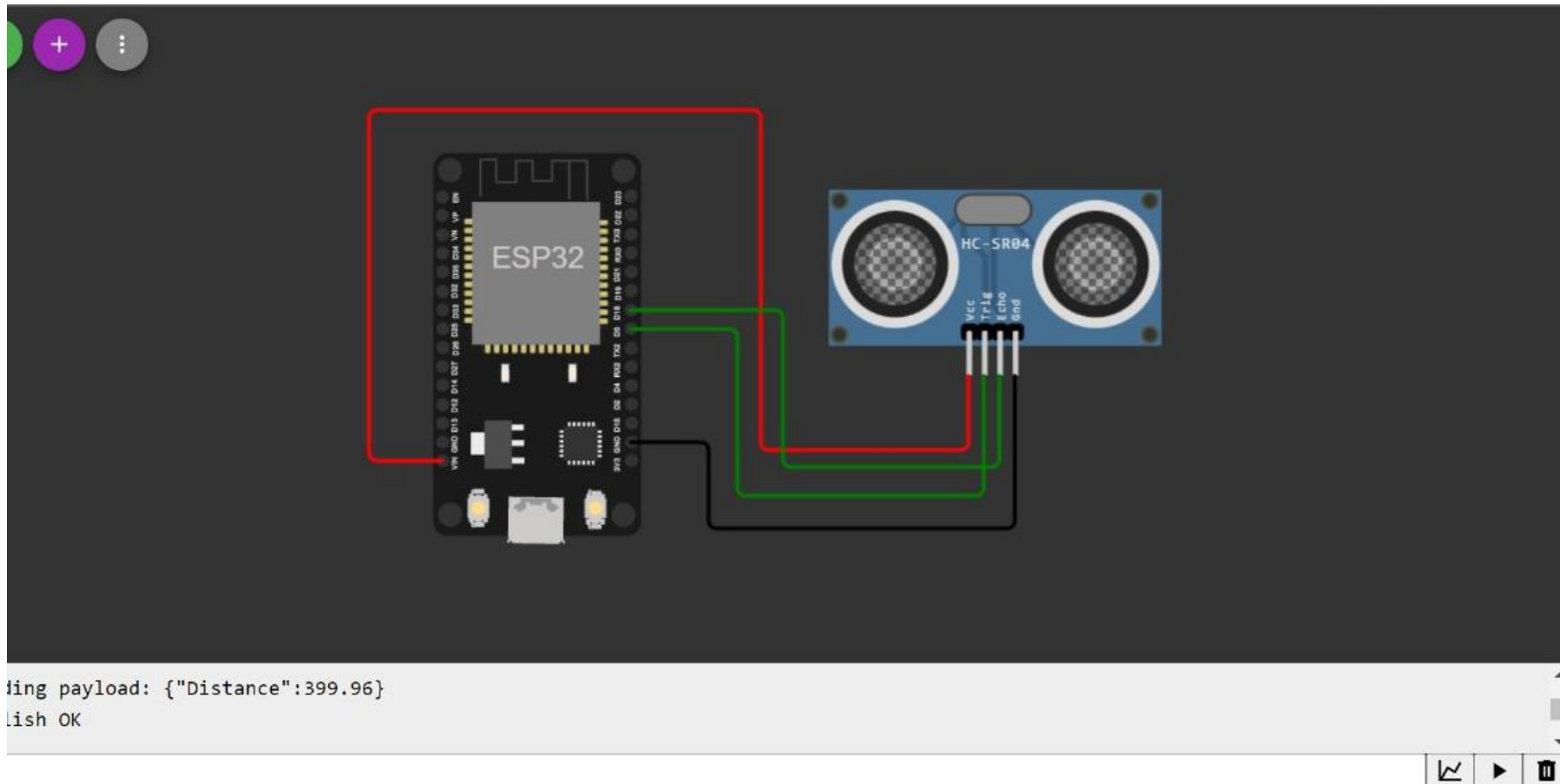
Sending payload: {"Distance":399.96}
Publish OK

Sending payload: {"Distance":399.96}
Publish OK

Sending payload: {"Distance":399.96}
Publish OK

Sending payload: {"Distance":399.96}
Publish OK

WOKWI:



IBM CLOUD:



1234567

Connected

sanjay

Device

Nov 10, 2022 9:14 PM

→ ...

Identity

Device Information

Recent Events

State

Logs

×

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

Event	Value	Format	Last Received
event_1	{"Distance":399.98}	json	a few seconds ago
event_1	{"Distance":399.96}	json	a few seconds ago
event_1	{"Distance":399.96}	json	a few seconds ago
event_1	{"Distance":399.94}	json	a few seconds ago
event_1	{"Distance":399.96}		

1 Simulation running