INDUSTRY – SPECIFIC INTELLIGENT FIRE MANAGEMENT SYSTEM

ASSIGNMENT – 4

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.

SOURCE CODE:

```
#include  <WiFi.h>

#include <PubSubClient.h>

#define ORG "486ral"

#define DEVICE_TYPE "IOT"

#define DEVICE_ID "id07"

#define TOKEN "123456789"

#define trigpin 5

#define echopin 18




char server[] = ORG ".messaging.internetofthings.ibmcloud.com";

char publishTopic[] = "iot-2/evt/data/fmt/json";

char authMethod[] = "use-token-auth";

char token[] = TOKEN;

char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;




WiFiClient wifiClient;

PubSubClient client(server, 1883, wifiClient);
```

```
long duration;
float dist;

void setup()
{
  Serial.begin(9900);

  pinMode(trigpin, OUTPUT);
  pinMode(echopin, INPUT);
  wifiConnect();
  mqttConnect();
}

void loop() {


  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);
    }

    Serial.println();
  }
}
```

```
void publishData()
{
  digitalWrite(trigpin,LOW);
  digitalWrite(trigpin,HIGH);
  delayMicroseconds(10);
  digitalWrite(trigpin,LOW);
  duration=pulseIn(echopin,HIGH);
  dist=duration*0.034 /2;
  if(dist<100)
  {

    String payload = "{\"Distance\":";
    payload += dist;
    payload += ",";
    payload += "\"Status\":";
    payload += "\"Alert\"}";

    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)
```

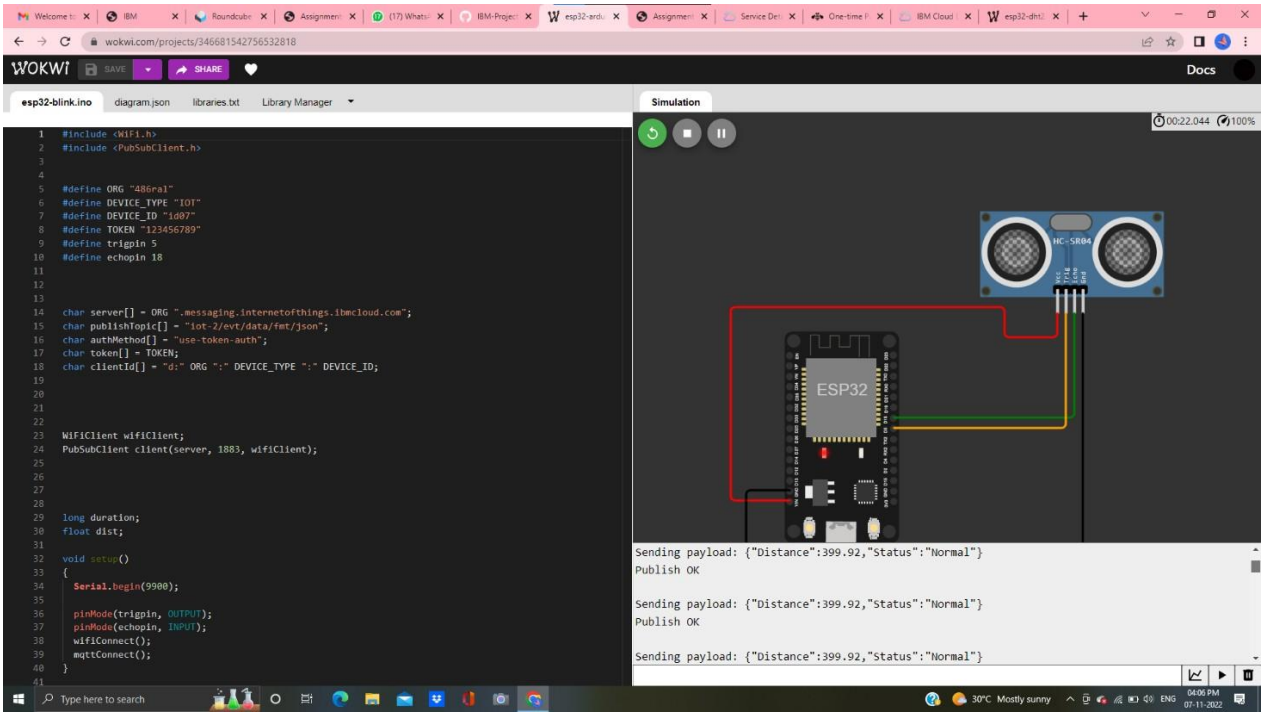
```
      {

        String payload = "{\"Distance\":";
        payload += dist;
        payload += ",";
        payload += "\"Status\":";
        payload += "\"Normal\"}";

    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");
    }
  }
  }
```

diagram.json:

```
{
  "version": 1,
  "author": "Uri Shaked",
  "editor": "wokwi",
  "parts": [
    { "type": "wokwi-esp32-devkit-v1", "id": "esp", "top": 0, "left": 0, "attrs": {} },
    { "type": "wokwi-hc-sr04", "id": "ultrasonic1", "top": -109.38, "left": 180.61, "attrs": {} }
```

```
  ],
  "connections": [
    [ "esp:TX0", "$serialMonitor:RX", "", [] ],
    [ "esp:RX0", "$serialMonitor:TX", "", [] ],
    [ "ultrasonic1:ECHO", "esp:D18", "green", [ "v0" ] ],
    [ "ultrasonic1:TRIG", "esp:D5", "orange", [ "v0" ] ],
    [
      "ultrasonic1:VCC",
      "esp:VIN",
      "red",
      [ "v22.14", "h-48.86", "v-27.94", "h-253.24", "v173.77" ]
    ],
    [ "ultrasonic1:GND", "esp:GND.2", "black", [ "v250.04", "h-311.59", "v3.06" ] ]
  ]
}
```

OUTPUT:



WOKWI LINK: https://wokwi.com/projects/322410731508073042

IBM CLOUD OUTPUT: