

ASSIGNMENT -4 :

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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 .

Solution:

```
#include <WiFi.h>
#include <PubSubClient.h>

#define ORG "mo229k"
#define DEVICE_TYPE "node"
#define DEVICE_ID "12345"
#define TOKEN "Lokesh@1234"
#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());
}

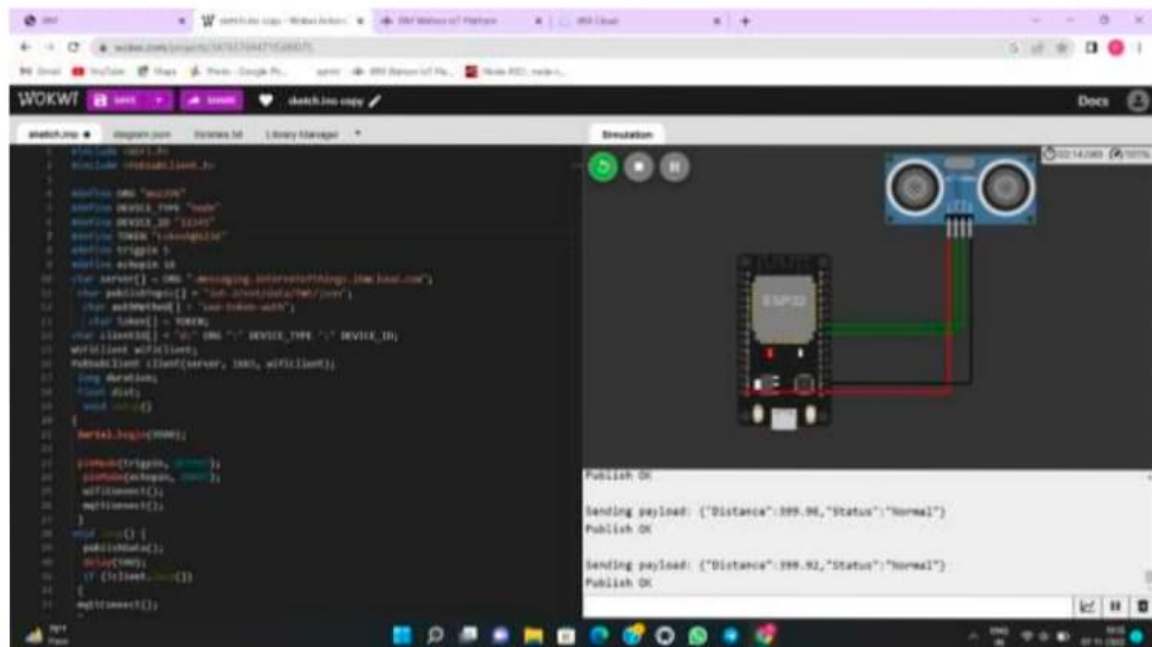
void mqttConnect()
{
    if (!client.connected())
    {
        Serial.print("Reconnecting MQTT client to ");
        Serial.println(server);
        while (!client.connect(clientId, authMethod, token))
        {
            Serial.print(".");
            delay(500);
        }
        Serial.println();
    }
}

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");
    }
}
}
```

IBM CLOUD OUTPUT :



The screenshot displays the IBM Watson IoT Platform interface. At the top, there's a navigation bar with 'Browse', 'Actions', 'Device Types', and 'Subflows'. A 'Add Device' button is visible on the right. The main content area shows a table of recent events for a device. The table has four columns: 'Event', 'Value', 'Format', and 'Last Received'. The data rows show 'data' events with values like '["Distance": 399.96, "Status": "Normal"]' in 'json' format, received 'a few seconds ago'. At the bottom, it indicates 'Items per page: 50' and '1 of 1 page'. A status bar at the very bottom says 'Simulation running'.

Event	Value	Format	Last Received
data	["Distance": 399.96, "Status": "Normal"]	json	a few seconds ago
data	["Distance": 399.96, "Status": "Normal"]	json	a few seconds ago
data	["Distance": 399.92, "Status": "Normal"]	json	a few seconds ago
data	["Distance": 399.92, "Status": "Normal"]	json	a few seconds ago
data	["Distance": 399.92, "Status": "Normal"]	json	a few seconds ago

Items per page: 50 | 1 of 1 page

Simulation running