ASSIGNMENT-4

DOMAIN : IOT

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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 ofIBM cloud

Solution:

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

WiFiClient

wifiClient;#define

ORG "kr9fjo"
#define DEVICE_TYPE "TestDeviceType"
#define DEVICE_ID "12345"
#define TOKEN "VJsSC148dk1dCN3UqS"
#define speed 0.034

char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
char publishTopic[] = "iot-2/evt/abcd_1/fmt/json";
char topic[] = "iot-
2/cmd/home/fmt/String";char authMethod[]
= "use-token-auth";
char token[] = TOKEN;
char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;
PubSubClient client(server, 1883,
wifiClient);void publishData();

const int
trigpin=5; const
int echopin=18;
String command;
String data="";
String
lat="14.167589";
String
lon="80.248510";
```

```
  String
  name="point2";
  String icon="";

  long
  duration;
  int dist;
        void setup()
  {

Serial.begin(115200);
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());
  }

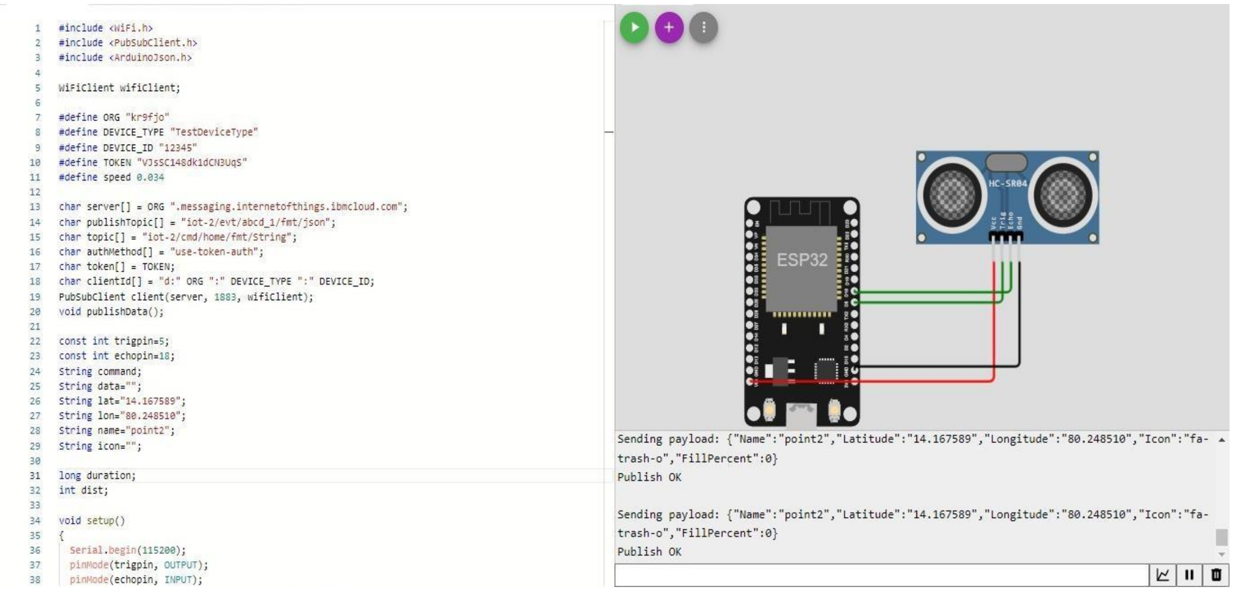
  void mqttConnect() {
    if (!client.connected()) {
      Serial.print("Reconnecting MQTT client to "); Serial.println(server);
      while (!client.connect(clientId, authMethod, token)) {
        Serial.print(".
        ");
        delay(1000);
      }
      initManagedDevice();
      Serial.println();
    }}
```

```
void initManagedDevice() {
  if (client.subscribe(topic)) {
    Serial.println(client.subscribe(topic));
    Serial.println("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){
    dist=100-
    dist;
    icon="fa-
    trash";
  }else{
    dist=0;
    icon="fa-trash-o";
  }
  DynamicJsonDocument
  doc(1024);String payload;
  doc["Name"]=name;
  doc["Latitude"]=lat;
  doc["Longitude"]=lon;
  doc["Icon"]=icon;
  doc["FillPercent"]=dist;
  serializeJson(doc,
  payload); delay(3000);
  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:



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PubSubClient client(server, 1883, wifiClient);
void publishData();

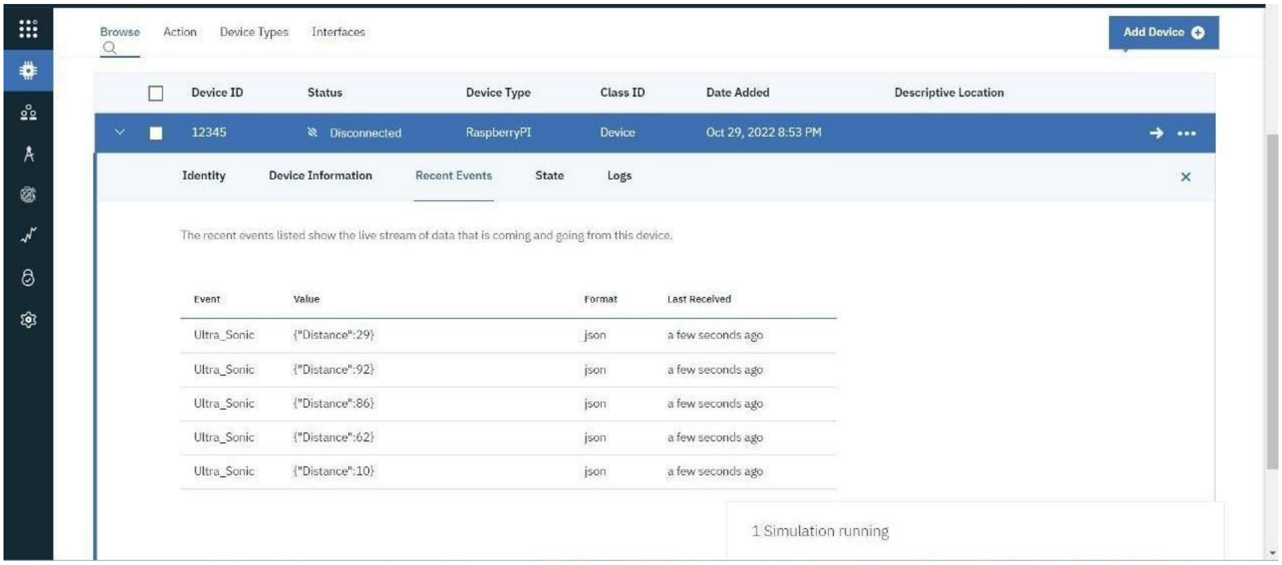
const int trigpin=5;
const int echopin=18;
String command;
String data="";
String lat="14.167589";
String lon="80.248510";
String name="point2";
String icon="";

long duration;
int dist;

void setup()
{
  Serial.begin(115200);
  pinMode(trigpin, OUTPUT);
  pinMode(echopin, INPUT);
```

```
Sending payload: {"Name":"point2","Latitude":"14.167589","Longitude":"80.248510","Icon":"fa-
trash-o","FillPercent":0}
Publish OK

Sending payload: {"Name":"point2","Latitude":"14.167589","Longitude":"80.248510","Icon":"fa-
trash-o","FillPercent":0}
Publish OK
```



□	Device ID	Status	Device Type	Class ID	Date Added	Descriptive Location
□	12345	Disconnected	RaspberryPI	Device	Oct 29, 2022 8:53 PM	

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

Event	Value	Format	Last Received
Ultra_Sonic	{"Distance":29}	json	a few seconds ago
Ultra_Sonic	{"Distance":92}	json	a few seconds ago
Ultra_Sonic	{"Distance":86}	json	a few seconds ago
Ultra_Sonic	{"Distance":62}	json	a few seconds ago
Ultra_Sonic	{"Distance":10}	json	a few seconds ago

1 Simulation running