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. Upload document with wokwi share link and images ofIBM cloud

Solution:

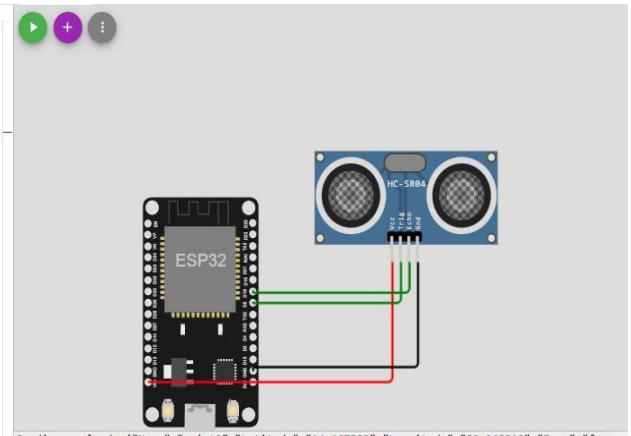
```
#include <WiFi.h>
#include
<PubSubClient.h>
#include
<ArduinoJson.h>

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");
```

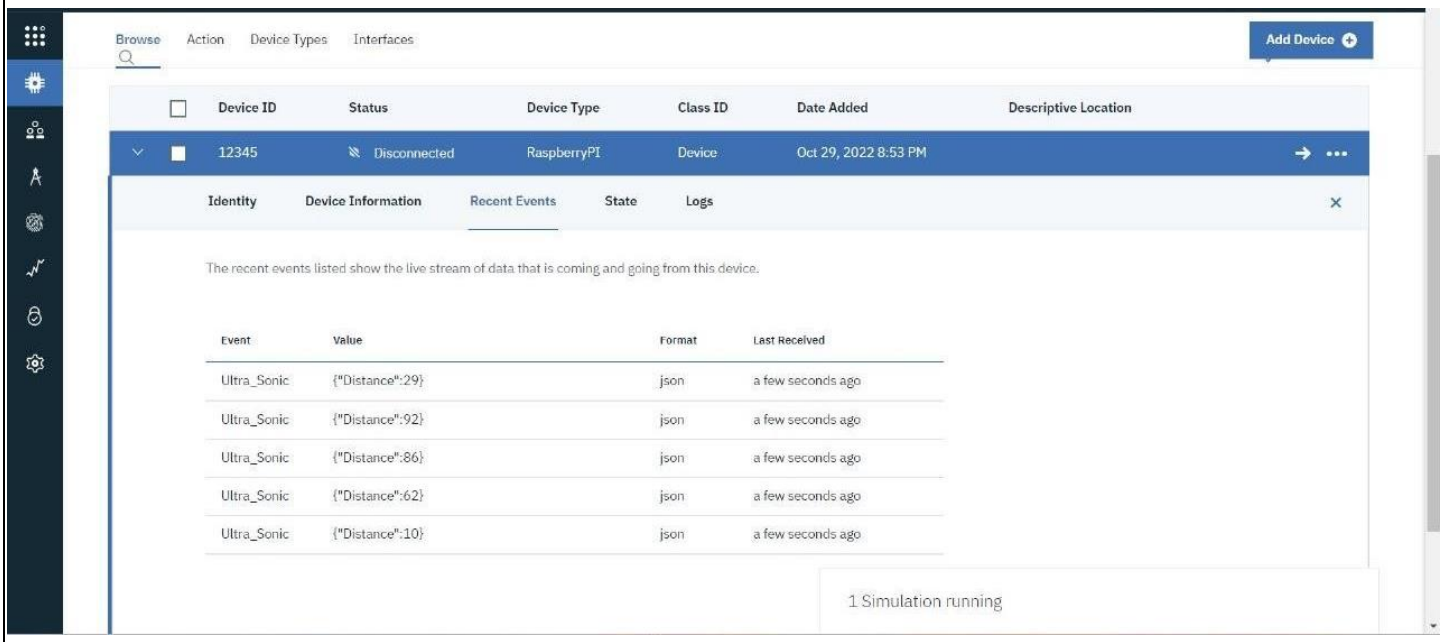
```
  } else {
    Serial.println("subscribe to cmd FAILED");
  }
}
void publishData()
{
  digitalWrite(trigpin,LOW);

  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:

```
#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);
```




```
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
```


Browse
Action
Device Types
Interfaces
Add Device
Device ID
Status
Device Type
Class ID
Date Added
Descriptive Location
12345
Disconnected
RaspberryPI
Device
Oct 29, 2022 8:53 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
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