ASSIGNMENT 4

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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 of IBM cloud

Sketch.ino

```
#include <WiFi.h>
#include <PubSubClient.h>
WiFiClient wifiClient;
String data3;
#define ORG "1yot2m"
#define DEVICE_TYPE "ESP"
#define DEVICE_ID "12345"
#define TOKEN "87654321"
#define speed 0.034
#define led 14
char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
char publishTopic[] = "iot-2/evt/GogulKrish/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="";

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 = "{\"Normal 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>101 && dist<111){
    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("Warning crosses 110cm -- it automaticaly of the
loop");
      digitalWrite(led,HIGH);
    }else {
      Serial.println("Publish FAILED");
    }

  }


  }
  void callback(char* subscribeTopic, byte* payload, unsigned int
payloadLength){
```

```
  Serial.print("callback invoked for topic:");
  Serial.println(subscribeTopic);
  for(int i=0; i<payloadLength; i++){
    dist += (char)payload[i];
  }
  Serial.println("data:"+ data3);
  if(data3=="lighton"){
    Serial.println(data3);
    digitalWrite(led,HIGH);
  }
  data3="";
}
```

Diagram.json

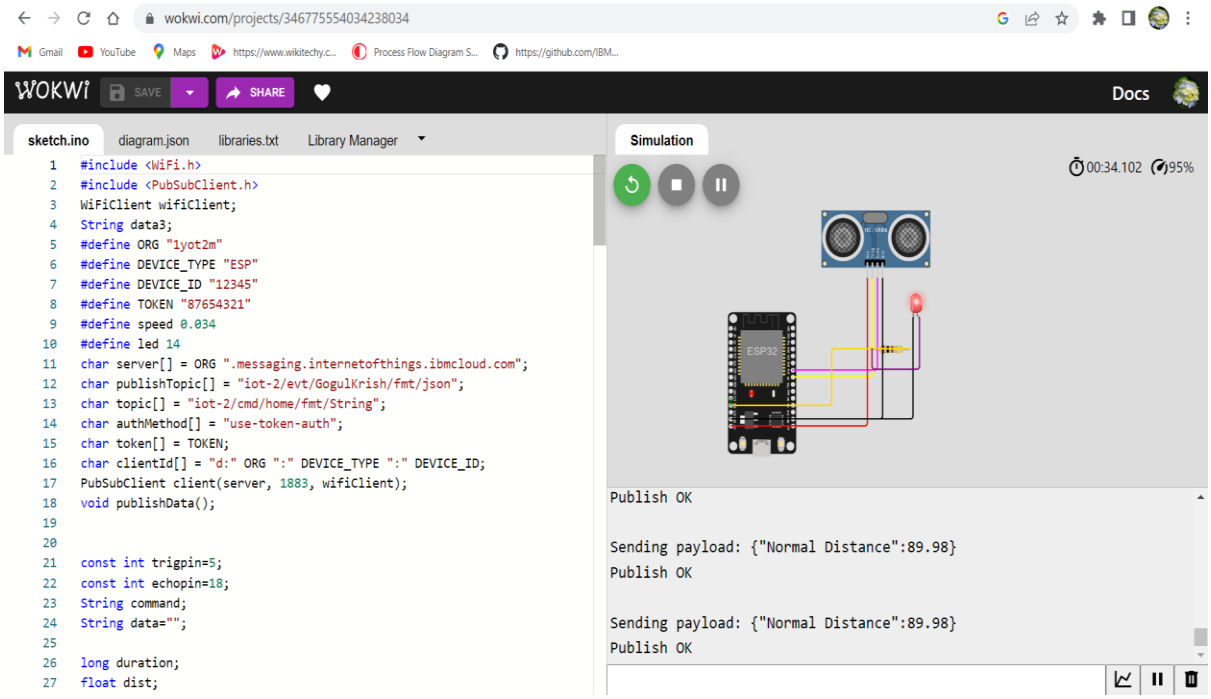
```
{
  "version": 1,
  "author": "YOGESHWARI.K",
  "editor": "wokwi",
  "parts": [
    { "type": "wokwi-esp32-devkit-v1", "id": "esp", "top": 226.46, "left": 35.54, "attrs": {} },
    {
      "type": "wokwi-led",
      "id": "led1",
      "top": 194.54,
      "left": 309.26,
      "attrs": { "color": "red" }
    },
    {
      "type": "wokwi-hc-sr04",
      "id": "ultrasonic1",
      "top": 87.9,
      "left": 181.29,
      "attrs": { "distance": "90" }
    },
    {
      "type": "wokwi-resistor",
      "id": "r1",
      "top": 269.89,
      "left": 260.39,
      "attrs": { "value": "100" }
```

```
    }
  ],
  "connections": [
    [ "esp:TX0", "$serialMonitor:RX", "", [] ],
    [ "esp:RX0", "$serialMonitor:TX", "", [] ],
    [ "ultrasonic1:TRIG", "esp:D5", "yellow", [ "v0" ] ],
    [ "ultrasonic1:ECHO", "esp:D18", "magenta", [ "v0" ] ],
    [ "ultrasonic1:VCC", "esp:VIN", "red", [ "v0" ] ],
    [ "ultrasonic1:GND", "esp:GND.1", "black", [ "v0" ] ],
    [ "esp:D12", "r1:2", "gold", [ "h156.9", "v62.96" ] ],
    [ "led1:C", "esp:GND.2", "black", [ "v0" ] ],
    [ "r1:1", "led1:A", "purple", [ "v28.12", "h94" ] ],
    [ "esp:D12", "esp:D14", "green", [ "h0" ] ]
  ]
}
```

Wokwi link:

https://wokwi.com/projects/346775554034238034

Output :

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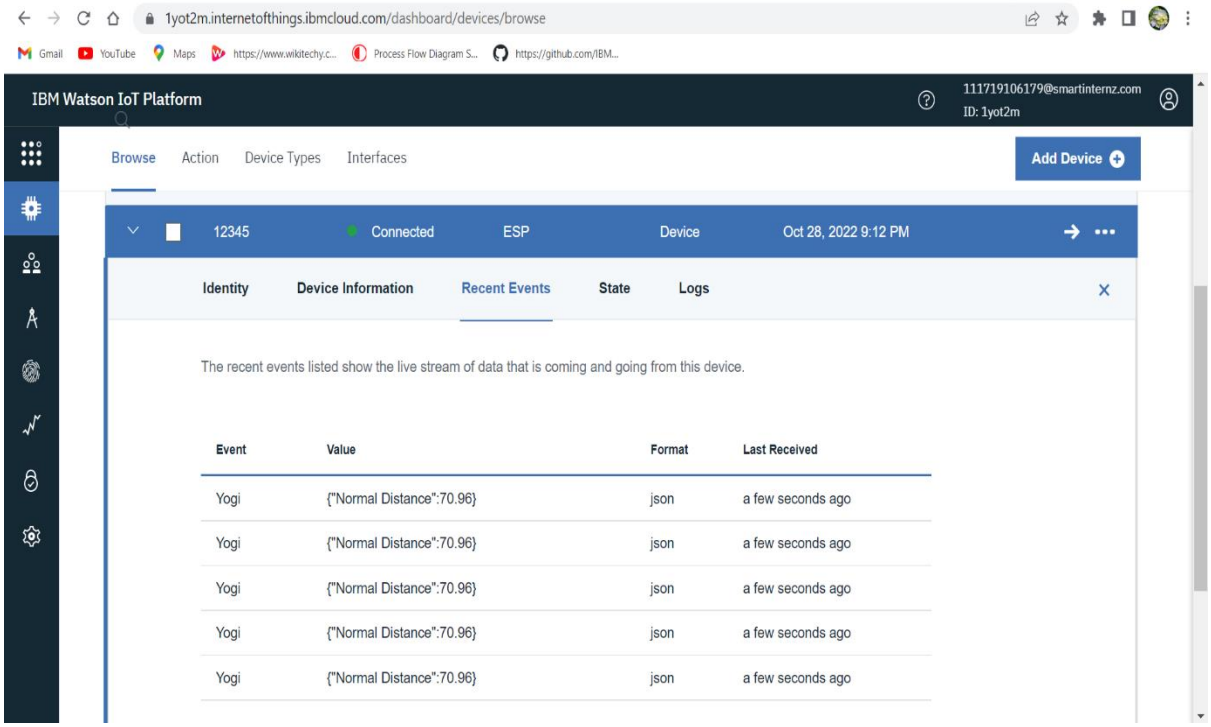
1yot2m.internetofthings.ibmcloud.com/dashboard/devices/browse
IBM Watson IoT Platform
111719106179@smartinternz.com
ID: 1yot2m
Browse
Action
Device Types
Interfaces
Add Device
12345
Connected
ESP
Device
Oct 28, 2022 9:12 PM
Identity
Device Information
Recent Events
State
Logs
The recent events listed show the live stream of data that is coming and going from this device.
Event
Value
Format
Last Received
Yogi
{"Normal Distance":70.96}
json
a few seconds ago
Yogi
{"Normal Distance":70.96}
json
a few seconds ago
Yogi
{"Normal Distance":70.96}
json
a few seconds ago
Yogi
{"Normal Distance":70.96}
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