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PROJECT NAME	Sign with smart connectivity for better road safety
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ASSIGNMENT 4

Ultrasonic sensor simulation in Wokwi

Question :

Write a code and connections in wokwi for the ultrasonic sensor. Whenever the distance is less than 100cms send an "Alert" to IBM cloud and display in the device recent events.

Code:

```
#include <WiFi.h>
#include <PubSubClient.h> void callback(char* subscribetopic,
byte* payload, unsigned int payloadLength);
//-----credentials of IBM Accounts-----#define ORG
"ge3f42"//IBM ORGANITION ID
#define DEVICE_TYPE "ESP32"//Device type mentioned in ibm watson IOT Platform
#define DEVICE_ID "3A-85-DD-94-7D-BC"//Device ID mentioned in ibm watson
IOT Platform #define TOKEN "sPNIlvo1-SQoK4Dhx8" //Token
String data3; char
server[] = ORG
".messaging.internetofthings.ibmcloud.com"; char
publishTopic[] = "iot-2/evt/Data/fmt/json"; char
subscribetopic[] =
"iot-2/cmd/test/fmt/String"; char
authMethod[] = "use-token-auth"; char token[]
= TOKEN;
```

```

char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;
WiFiClient wifiClient;
PubSubClient client(server, 1883, callback
, wifiClient); const int trigPin = 5; const int echoPin =
18; #define SOUND_SPEED 0.034 long duration;
float distance; void setup()
{
  Serial.begin(115200);
  pinMode(trigPin,
  OUTPUT);
  pinMode(echoPin, INPUT);
  wificonnect();
  mqttconnect();
} void loop()
{
  digitalWrite(trigPin, HIGH);
  delayMicroseconds(10); digitalWrite(trigPin,
  LOW); duration = pulseIn(echoPin, HIGH);
  distance = duration * SOUND_SPEED/2;
  Serial.print("Distance (cm): ");
  Serial.println(distance); if(distance>100)
  {
    Serial.println("ALERT!!");
    delay(100);
    PublishData(distance);
    delay(100); if (!client.loop())
    { mqttconnect();
    } } delay(100);
  }
  void PublishData(float dist) { mqttconnect();
  String payload = "{\"Distance\":\""; payload +=
  dist;
  payload += "\", \"ALERT!!\":\"\"Distance less than 100cms\"";
  payload += "\"}";
  Serial.print("Sending payload: "); Serial.println(payload);

  if (client.publish(publishTopic, (char*) payload.c_str())) {
    Serial.println("Publish ok");
  } else {
    Serial.println("Publish failed");
  } } void mqttconnect() { if
  (!client.connected()) {
    Serial.print("Reconnecting client to "); Serial.println(server);
    while (!client.connect(clientId, authMethod, token)) { Serial.print(".");
    delay(100); } initManagedDevice();
    Serial.println();
  }
}

```

```

digitalWrite (trigPin , LO );
delayMicroseconds (2);

```

```

void wificonnect()

Serial.println();
Serial.print("Connecting to ");
WiFi.begin("Wokwi-GUEST", "", 6);
while (WiFi.status() != WL_CONNECTED) {
  delay(100);
  Serial.print(".");

  Serial.println("");
  Serial.println("WiFi connected");
  Serial.println("IP address: ");
  Serial.println(WiFi.localIP());

void initManagedDevice() {
  if (client.subscribe(subscribetopic)) {
    Serial.println((subscribetopic));
    Serial.println("subscribe to cmd OK");
  } else {
    Serial.println("subscribe to cmd 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++) {
  //Serial.print((char)payload[i]);
  data3 += (char)payload[i];

Serial.println("data: "+ data3);
data3="";}

```

DIAGRAM.JSON

```

{
  "version": 1,
  "author": "sweetysharon",
  "editor": "wokwi",
  "parts": [
    { "type": "wokwi-esp32-devkit-v1", "id": "esp", "top": -4.67, "left": -112.87, "attrs": {} },
    { "type": "wokwi-hc-sr04", "id": "ultrasonic1", "top": 15.96, "left": 89.17, "attrs": {} }
  ],
  "connections": [
    [ "esp:TX0", "$serialMonitor:RX", "", [] ],
    [ "esp:RX0", "$serialMonitor:TX", "", [] ],
  ]
}

```

```

    }

    }

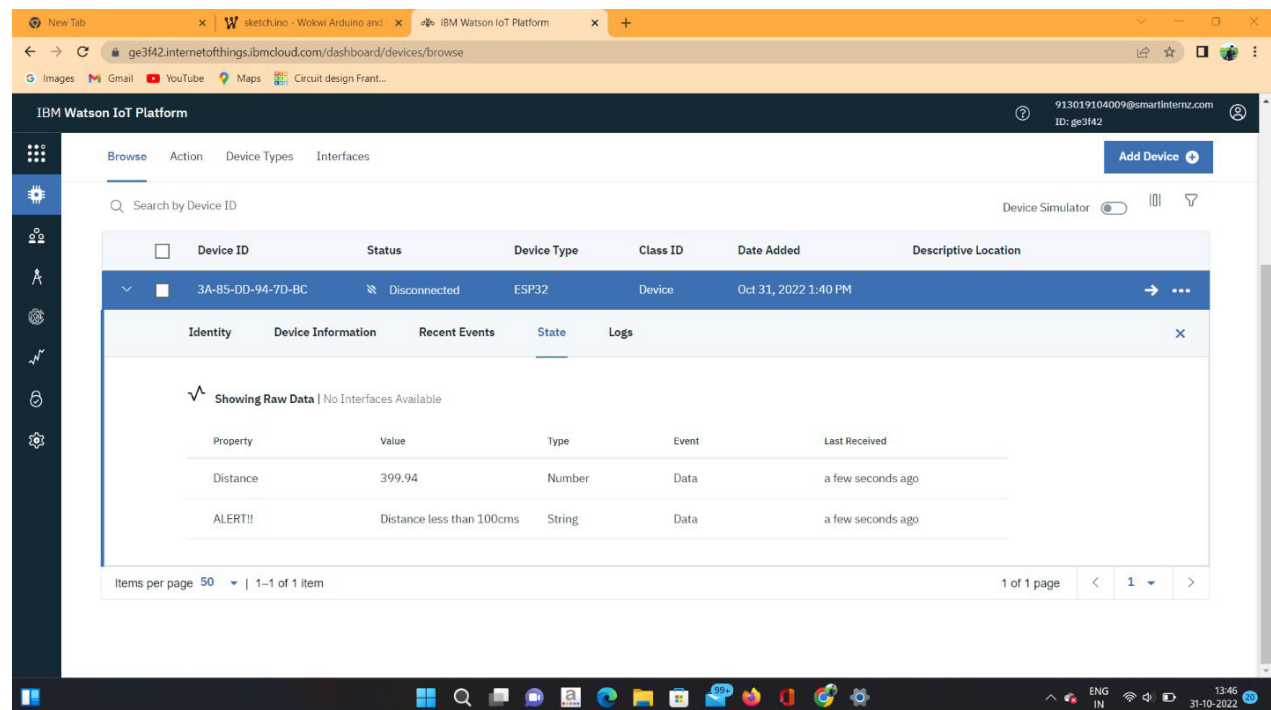
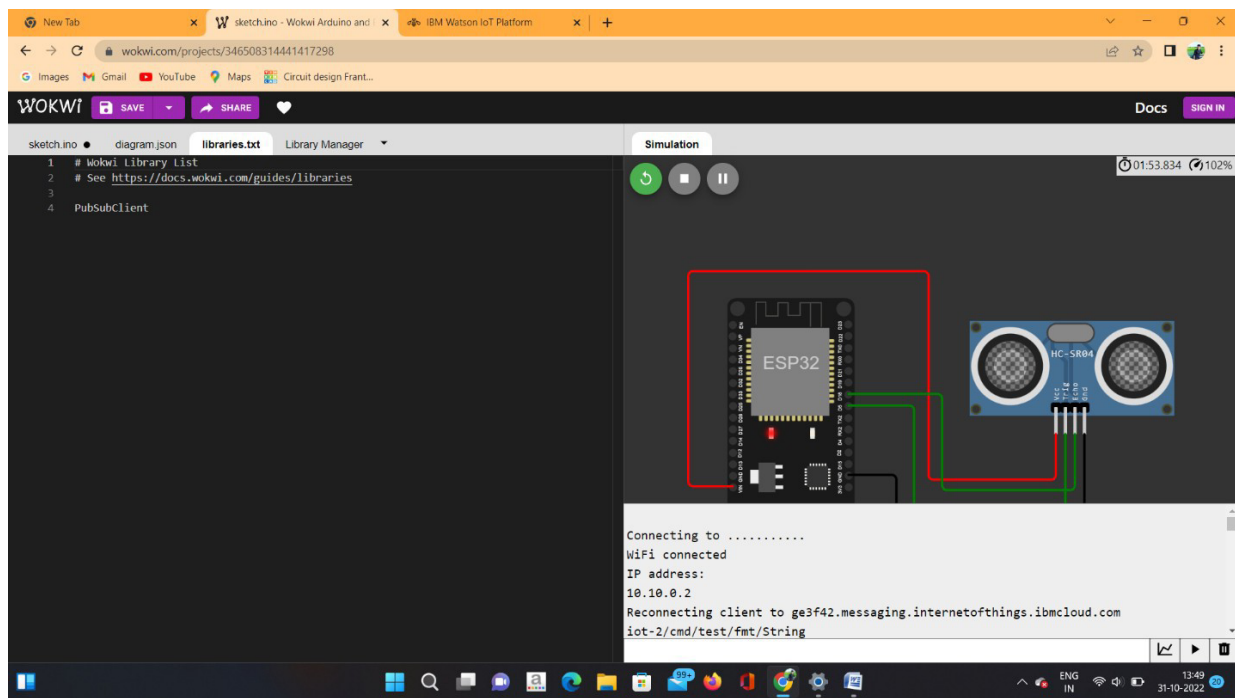
    }
    {

    }

    {
    [
        "esp:VIN",
        "ultrasonic1:VCC",
        "red",
        [ "h-37.16", "v-178.79", "h200", "v173.33", "h100.67" ]
    ],
    [ "esp:GND.1", "ultrasonic1:GND", "black", [ "h39.87", "v44.04", "h170" ] ],
    [ "esp:D5", "ultrasonic1:TRIG", "green", [ "h54.54", "v85.07", "h130.67" ]
    ],
    [ "esp:D18", "ultrasonic1:ECHO", "green", [ "h77.87", "v80.01", "h110" ] ]
    ]
}

```

OUTPUT :



CIRCUIT DIAGRAM :

