Assignment 4

Industry-Specific Intelligent Fire Management System

Write code and connections in wokwi for ultrasonic sensor. Whenever distance is less than 100 cms send "alert" to ibm cloud and display in device recent events.
Upload document with wokwi share link and images of ibm cloud

```
 #include <WiFi.h>
#include <PubSubClient.h>
WiFiClient wifiClient;
String data3;
#define ORG "4yi0vc"
#defineDEVICE_TYPE"Ultro_sonic_1"
#define DEVICE_ID "Ultro_sonic"
#define TOKEN "123456789"
#define speed 0.034
#define led 14
char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
char publishTopic[] = "iot-2/evt/Data/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 += "}";

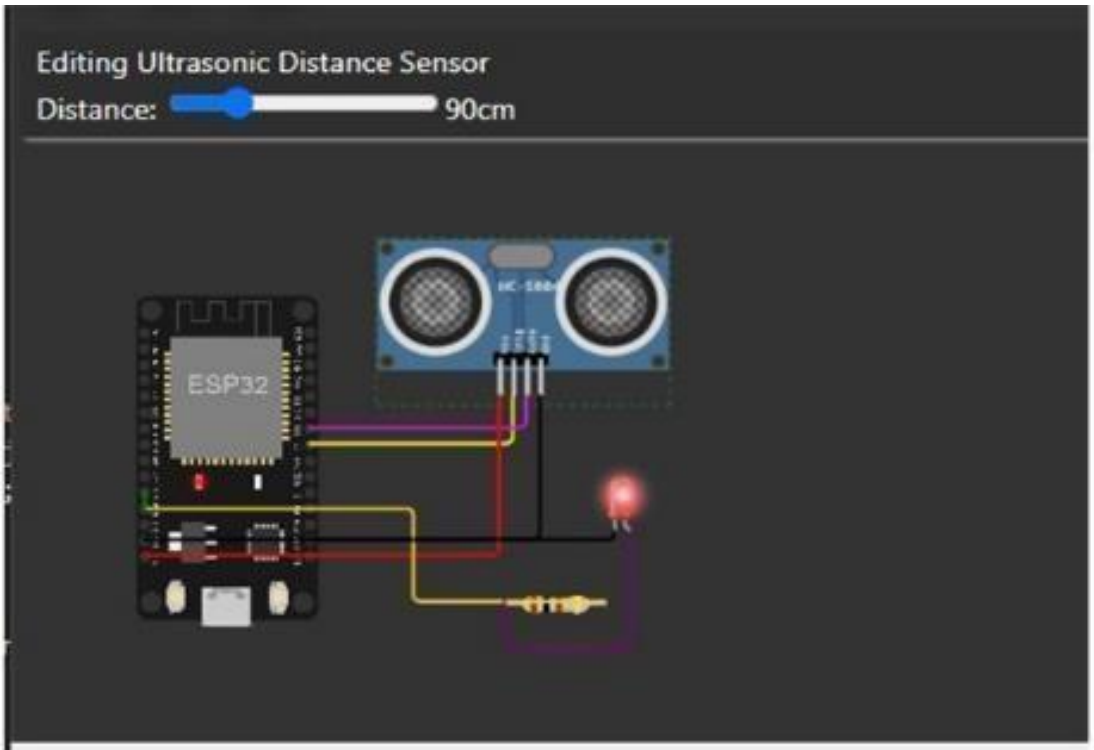
    Serial.print("\n");
    Serial.print("Sending payload: ");
    Serial.println(payload);
    if (client.publish(publishTopic, (char*) payload.c_str())) {
      Serial.println("Publish OK");
    }

  }
    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="";
}
```




```
Sending payload: {"Normal Distance":89.95}
Publish OK

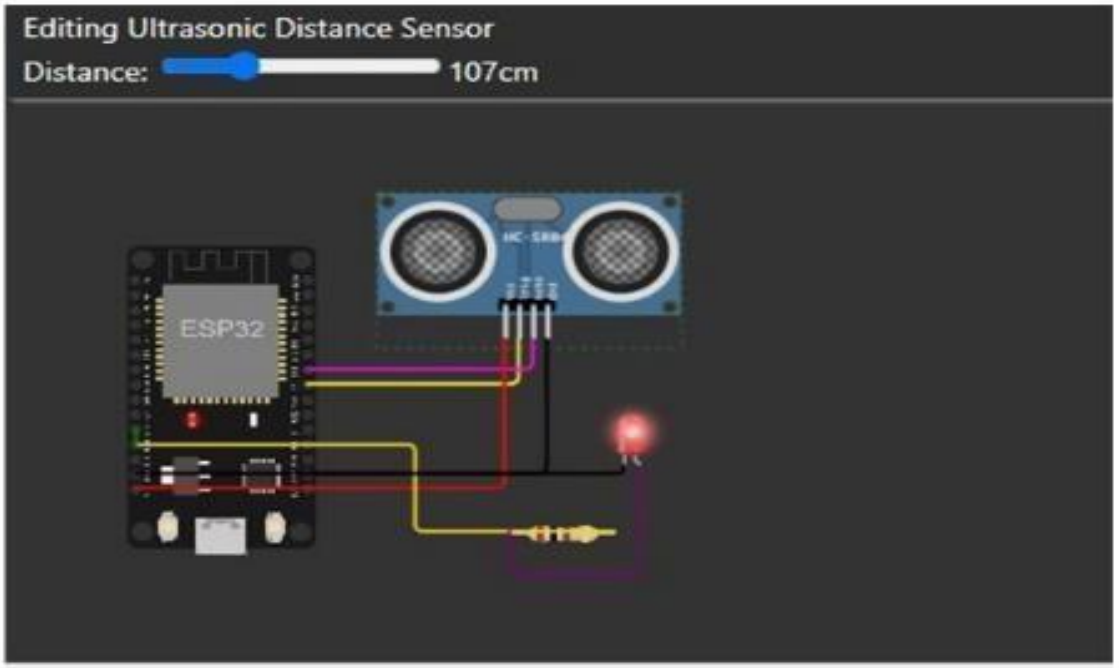
Sending payload: {"Normal Distance":89.95}
Publish OK

Sending payload: {"Normal Distance":89.95}
Publish OK

Sending payload: {"Normal Distance":89.98}
Publish OK

Sending payload: {"Normal Distance":89.95}
Publish OK

Sending payload: {"Normal Distance":89.95}
Publish OK
```




```
Sending payload: {"Alert distance":106.98}
Warning crosses 110cm -- it automaticaly of the loop

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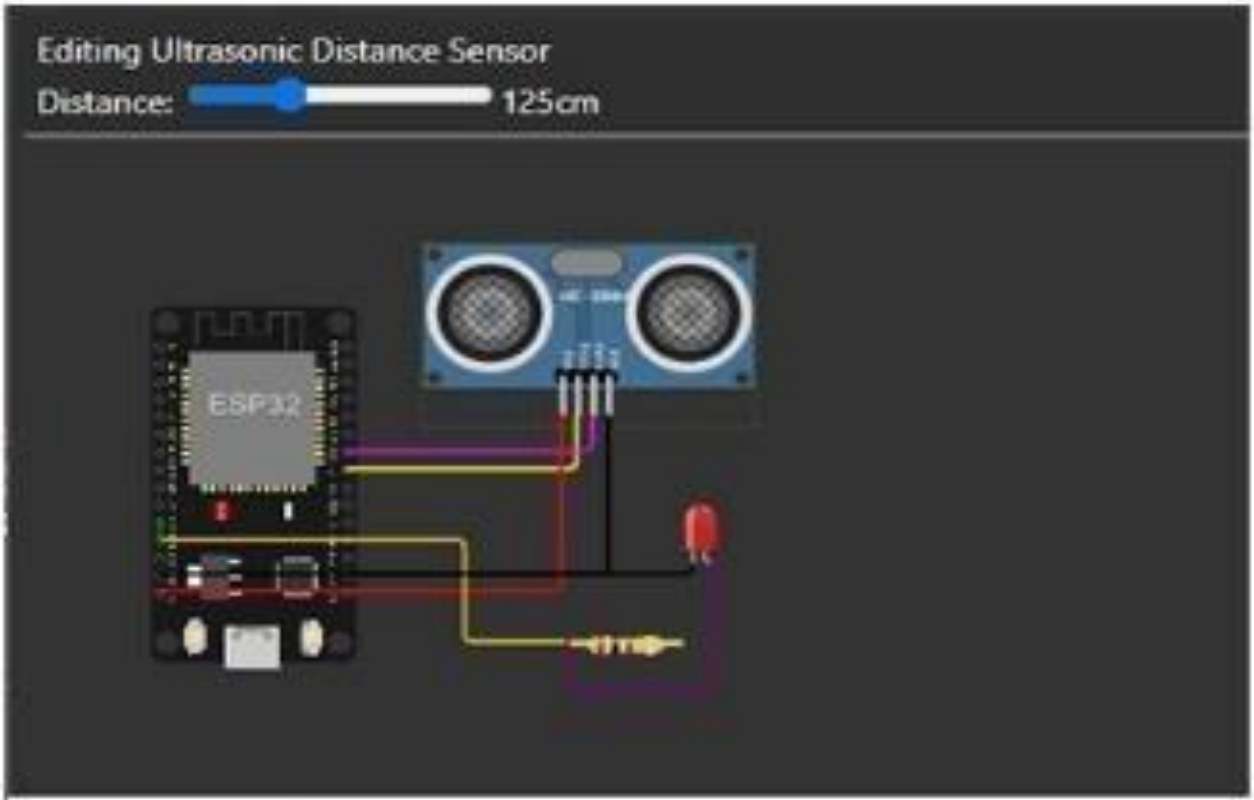


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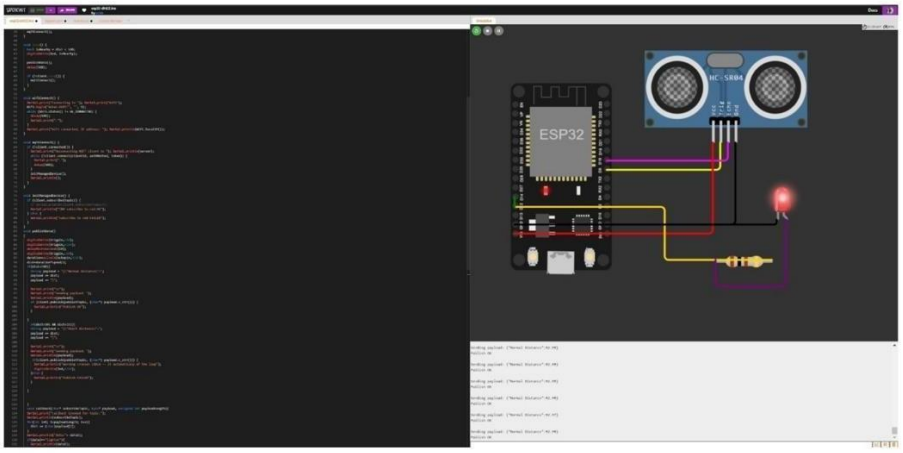
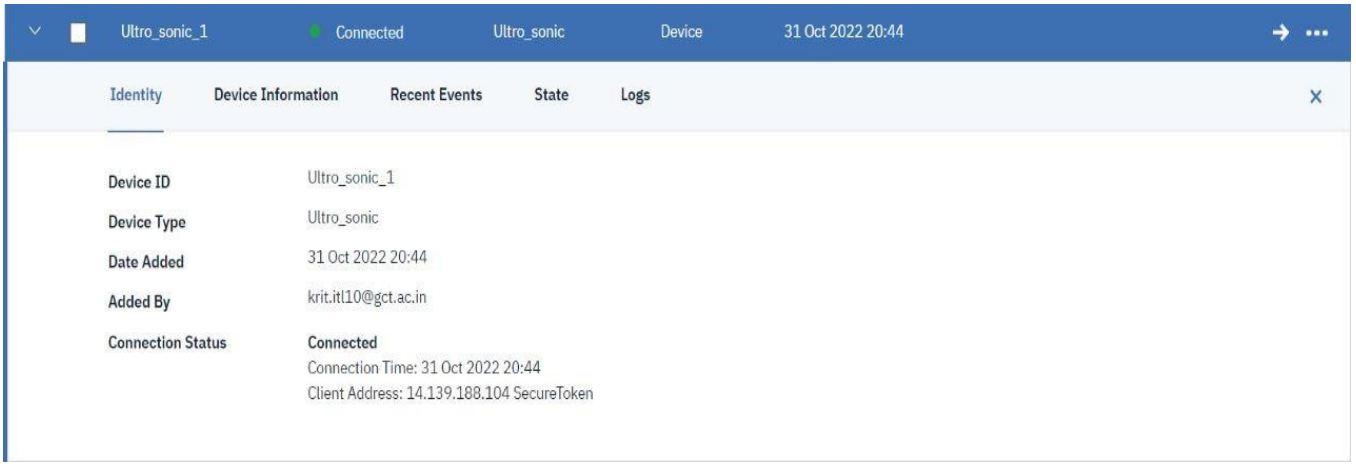
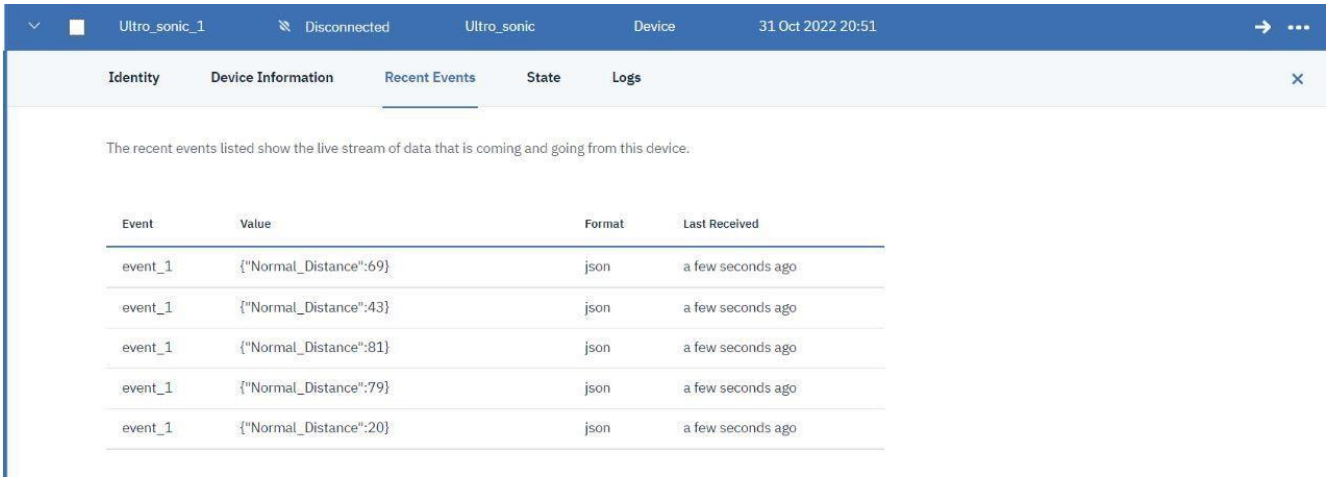
OUTPUT:


ESP32
HC-SR04


Ultro_sonic_1
Connected
Ultro_sonic
Device
31 Oct 2022 20:44
Identity
Device Information
Recent Events
State
Logs
Device ID
Ultro_sonic_1
Device Type
Ultro_sonic
Date Added
31 Oct 2022 20:44
Added By
krit.itl10@gct.ac.in
Connection Status
Connected
Connection Time: 31 Oct 2022 20:44
Client Address: 14.139.188.104 SecureToken


Ultro_sonic_1
Disconnected
Ultro_sonic
Device
31 Oct 2022 20:51
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
event_1
{"Normal_Distance":69}
json
a few seconds ago
event_1
{"Normal_Distance":43}
json
a few seconds ago
event_1
{"Normal_Distance":81}
json
a few seconds ago
event_1
{"Normal_Distance":79}
json
a few seconds ago
event_1
{"Normal_Distance":20}
json
a few seconds ago