Assignment -4

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Question-1:

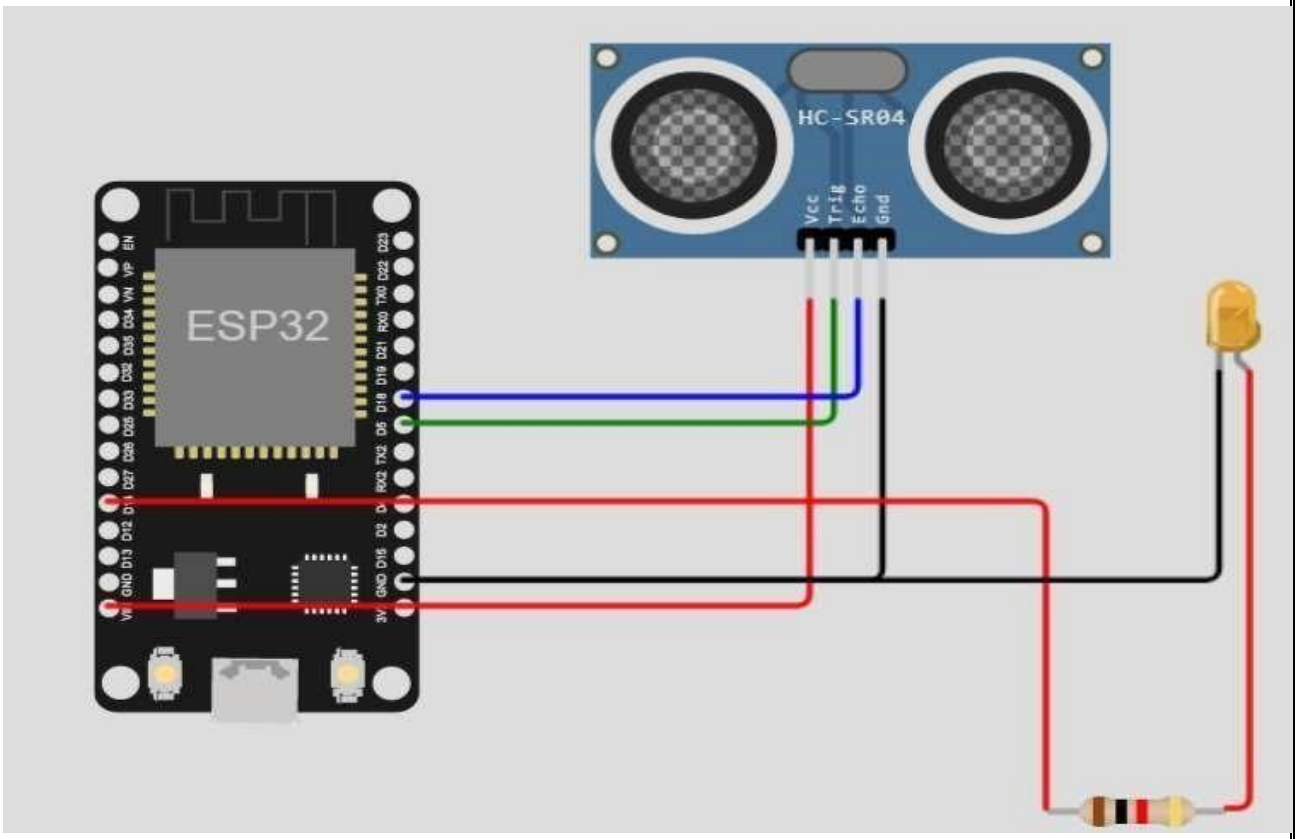
Write code and connections in wokwi for ultrasonic sensor. Whenever distance is less than 100 cm send "alert" to ibm cloud and display in device recent events.

Code :

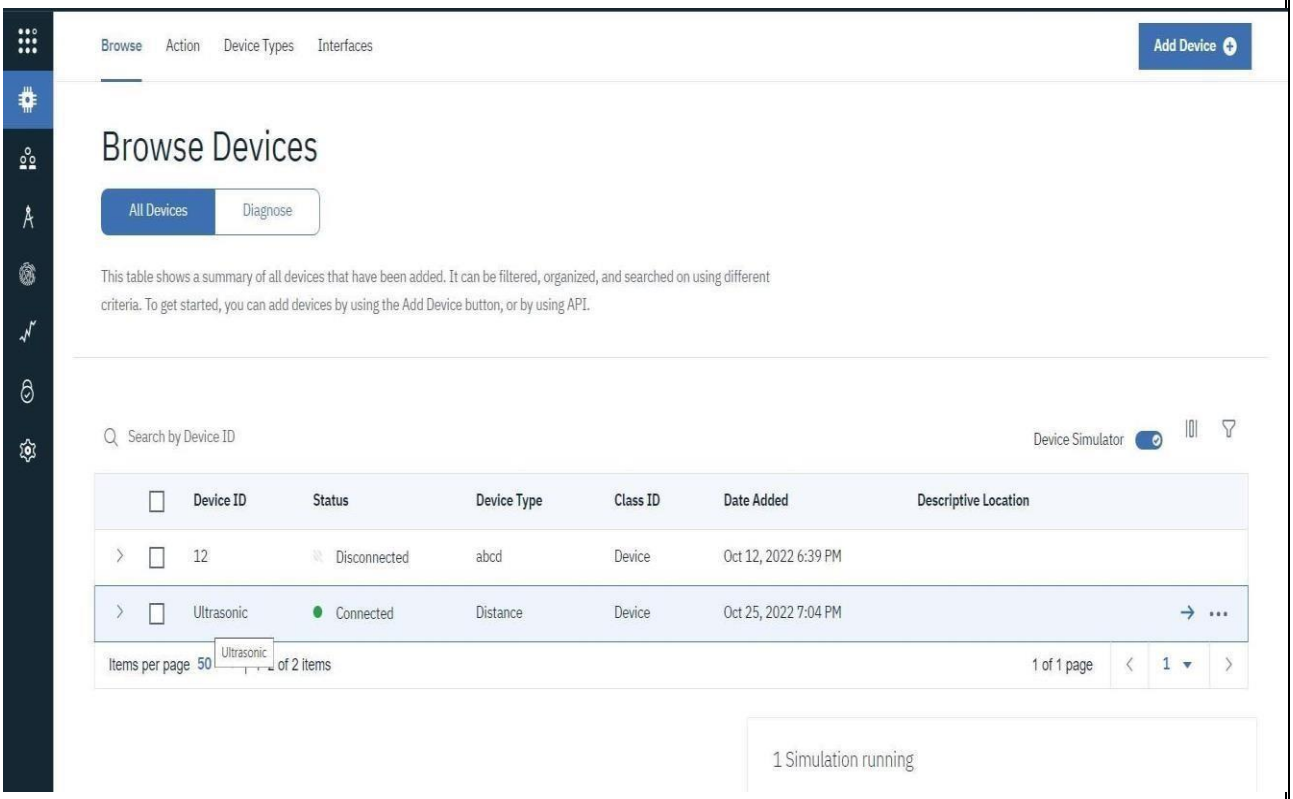
```
#include <WiFi.h>
#include <PubSubClient.h>
WiFiClient wifiClient;
String data3;
#define ORG "hycgw4"
#define DEVICE_TYPE "Distance"
#define DEVICE_ID "Ultrasonic"
#define TOKEN "WD6Mb(-d2F+X0xWqnB"
#define speed 0.034  #define led 14 char server[] = ORG
".messaging.internetofthings.ibmcloud.com"; char publishTopic[] = "iot2/evt/event2/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);

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("WokwiGUEST", "", 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,LO W);
digitalWrite(trigpin,HIG
H);
delayMicroseconds(10);
digitalWrite(trigpin,LO W);
duration=pulseIn(echopi
n,HIGH);
dist=duration*speed/2;
if(dist<100){
    String payload = "{\"Alert!! 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("Publish OK");
    }
       }
    if(dist>100){
    String payload = "{\"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");
    }else {
      Serial.println("Publish FAILED");
    }
  }



  }
```

Connections:

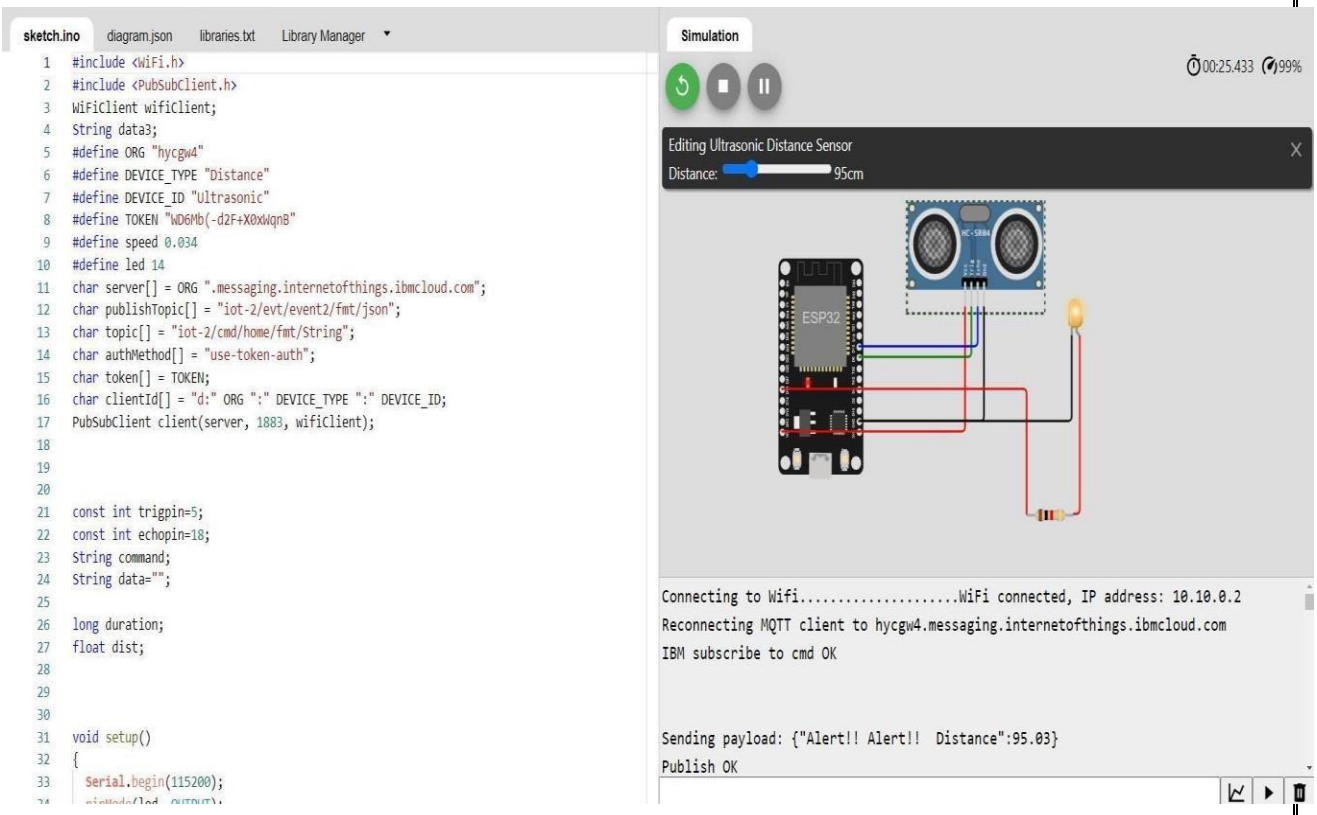


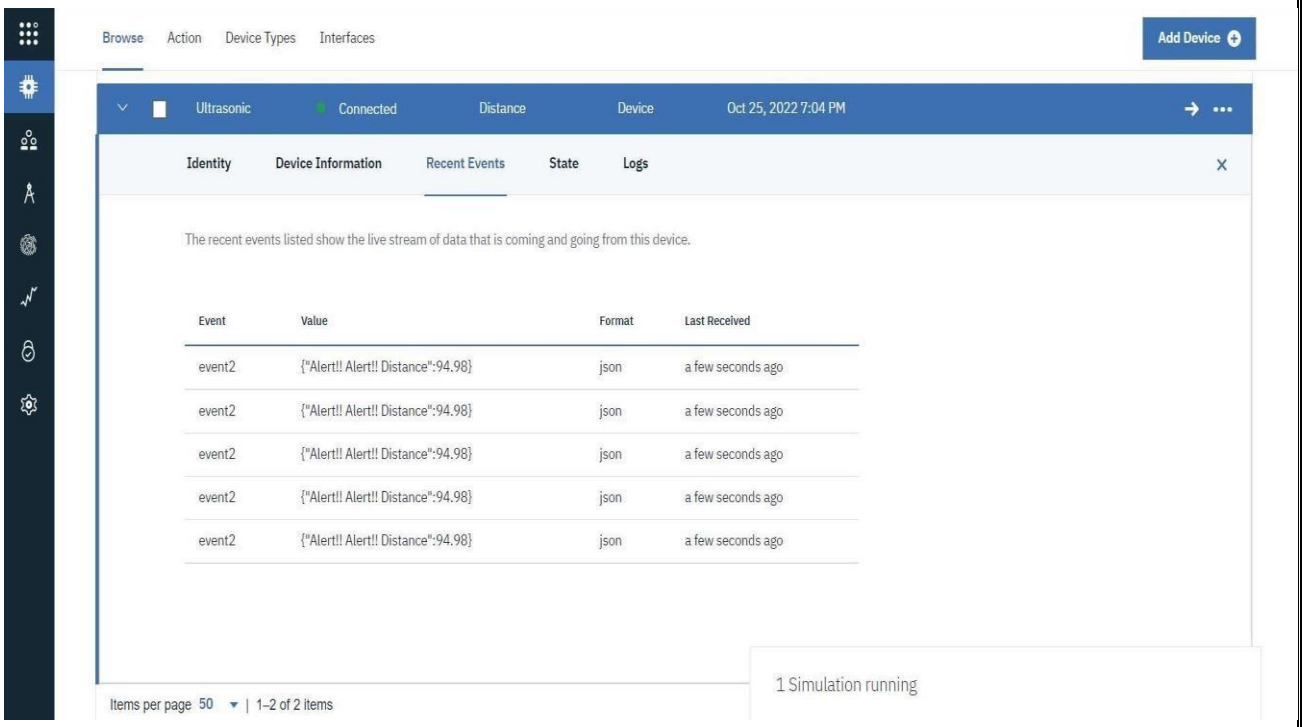
WOKWI AND IBM CLOUD CONNECTED:



OUTPUT:

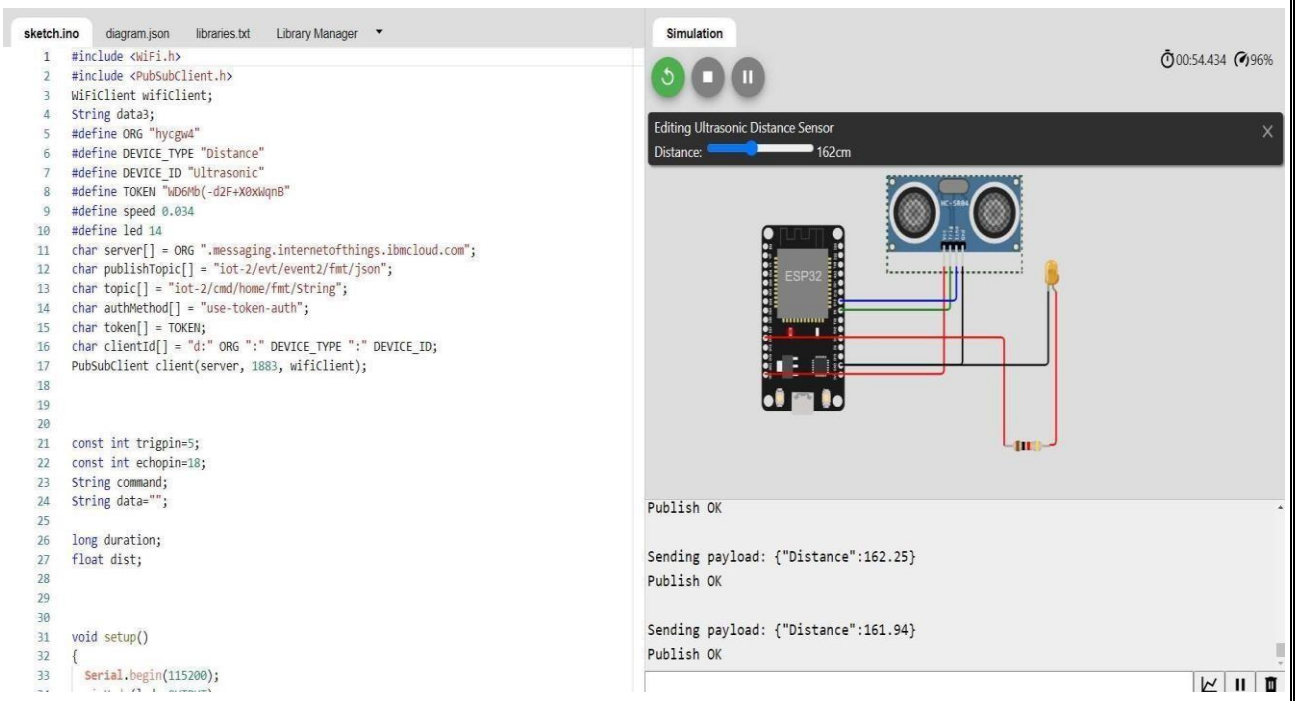
1. Distance = 95 cm Status
   = Alert Message

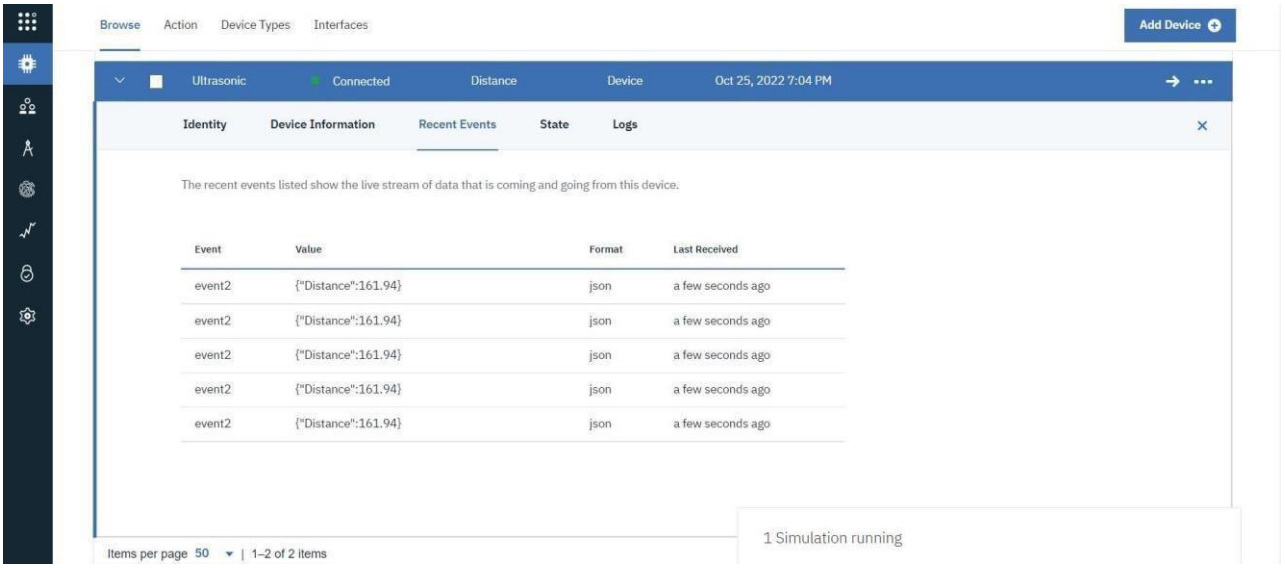




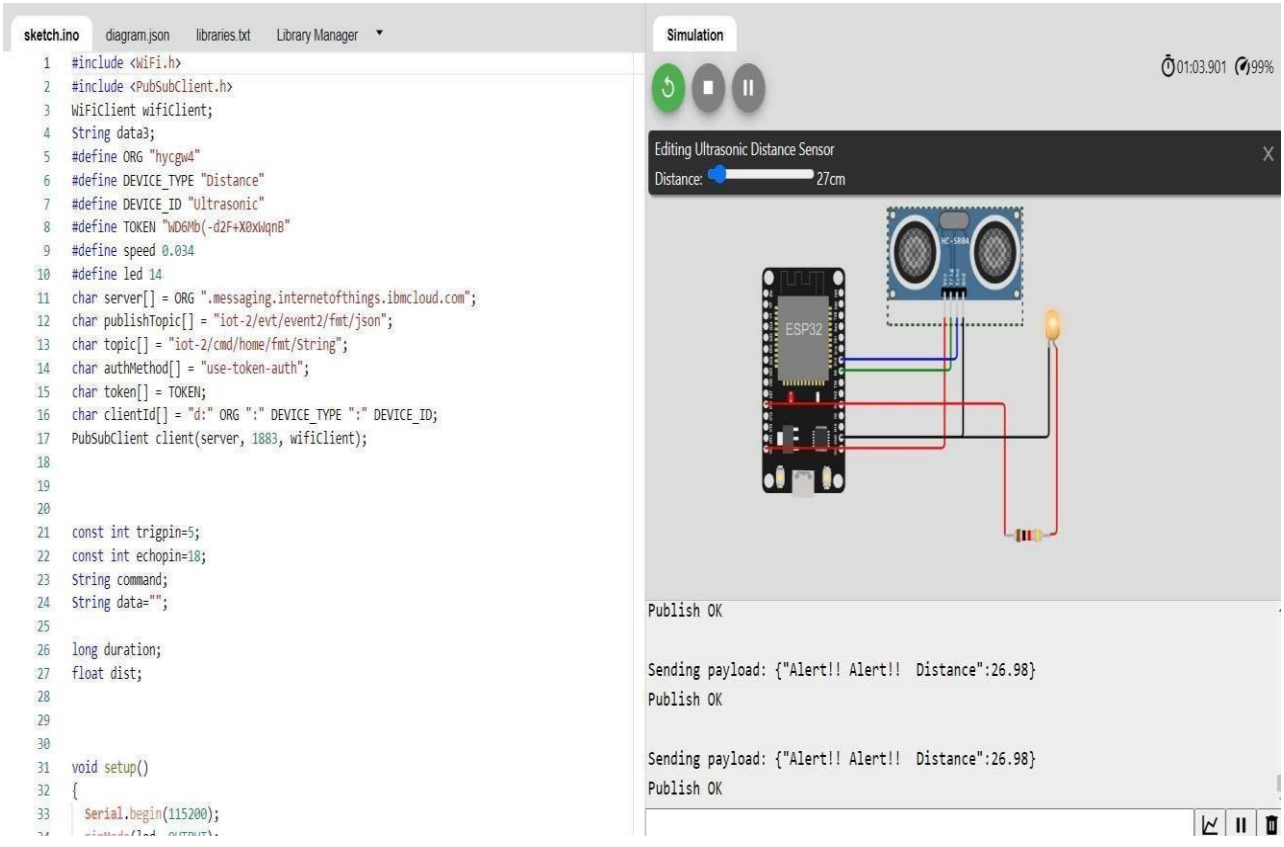
Wokwi data publishing to ibm cloud

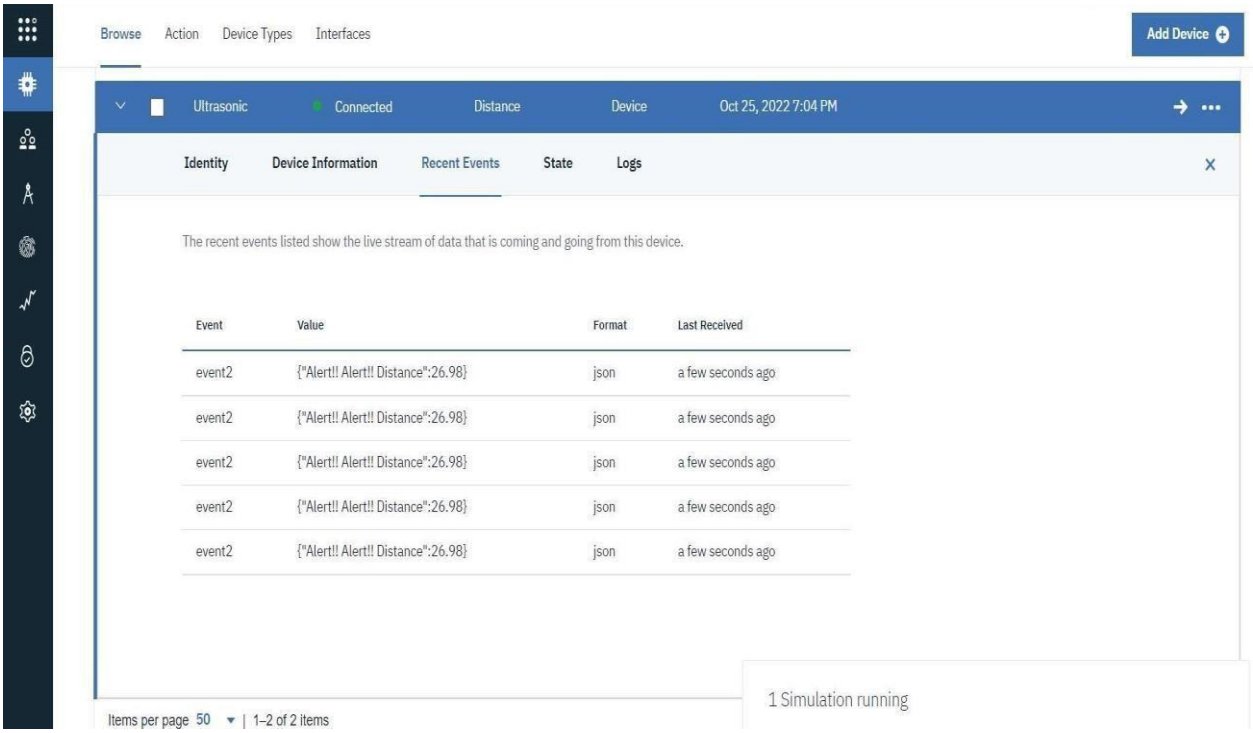
2. Distance = 162 cm Status = Normal





3. Distance = 27 cm Status
   = Alert Message





Reference link = https://wokwi.com/projects/346498745135792724