Assignment -4

Assignment Date	25 October 2022
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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.

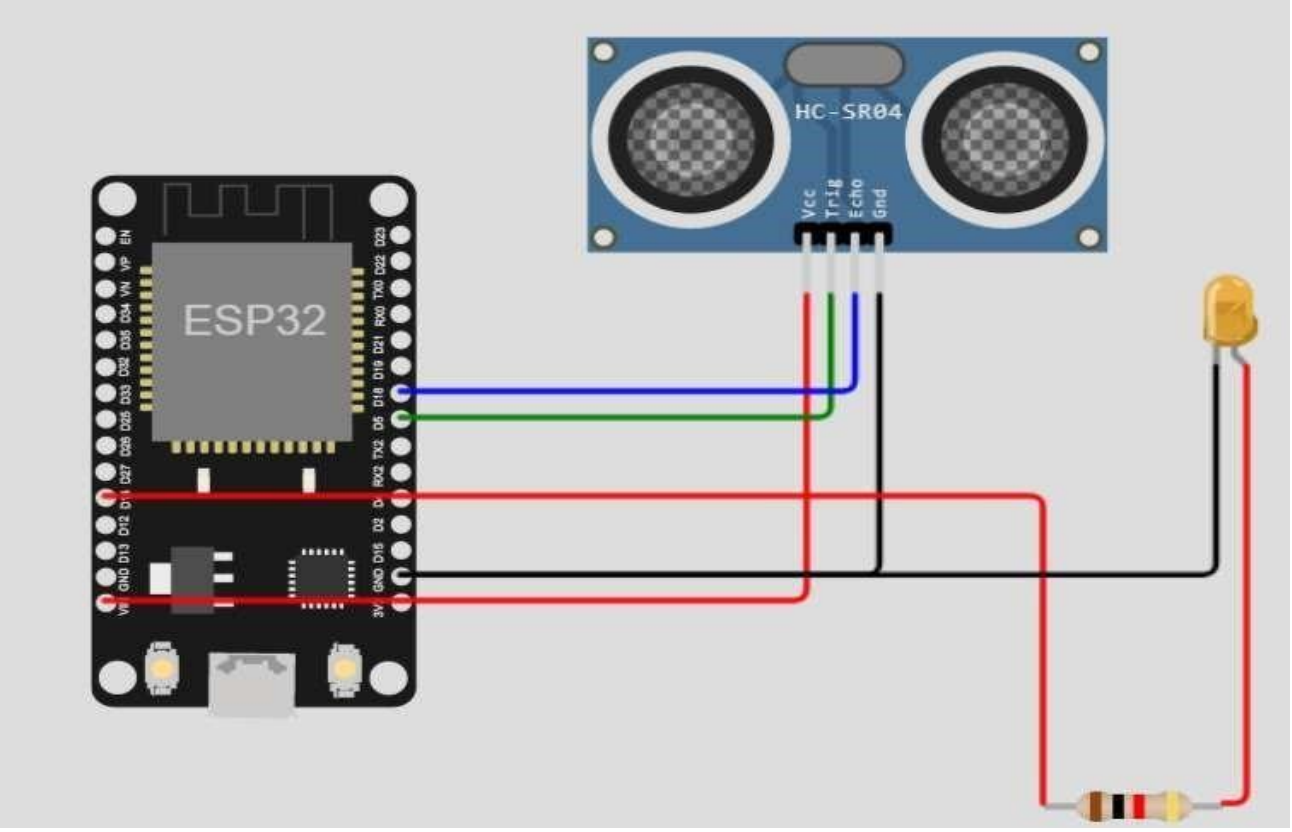
Code :

```
#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();
  }
```

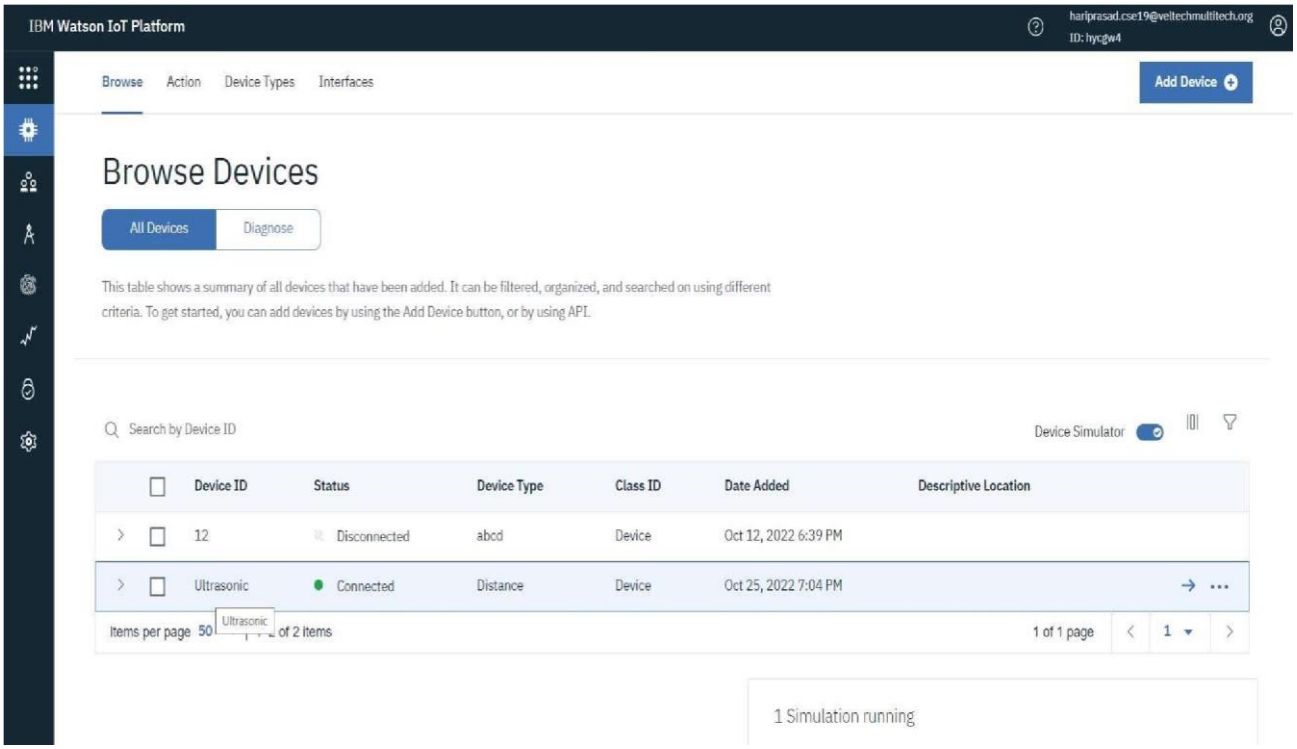
```
}
void wifiConnect() {
  Serial.print("Connecting to ");  Serial.print("Wifi");
WiFi.begin("WokwiGUEST", "", 6);  while (WiFi.status() !=
WL_CONNECTED) {  delay(500);
   Serial.print(".");
  }
  Serial.print("WiFi connected, IP address: ");
Serial.println(WiFi.localIP());
}  void mqttConnect() {  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:

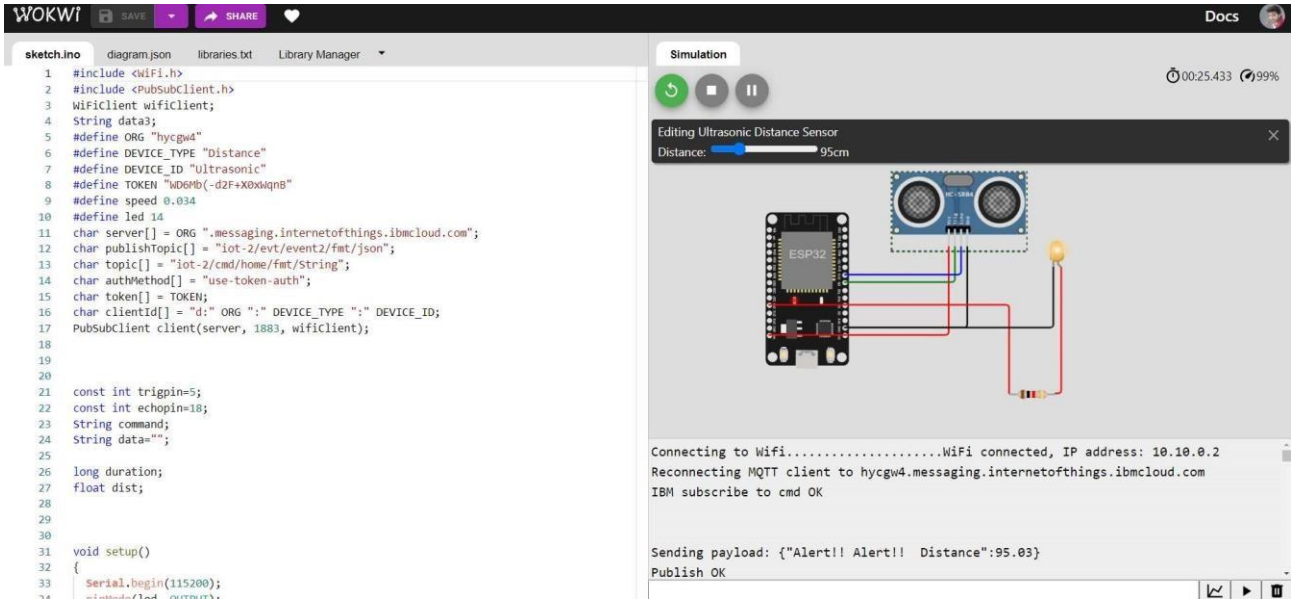


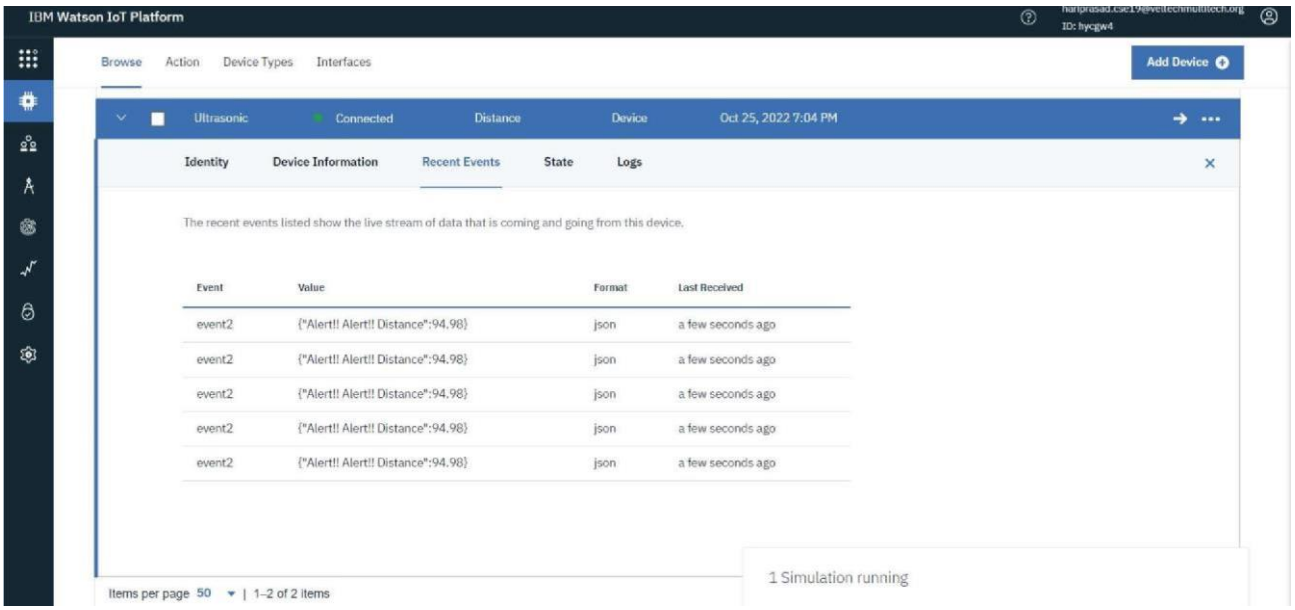
WOKWI AND IBM CLOUD CONNECTED:



OUTPUT:

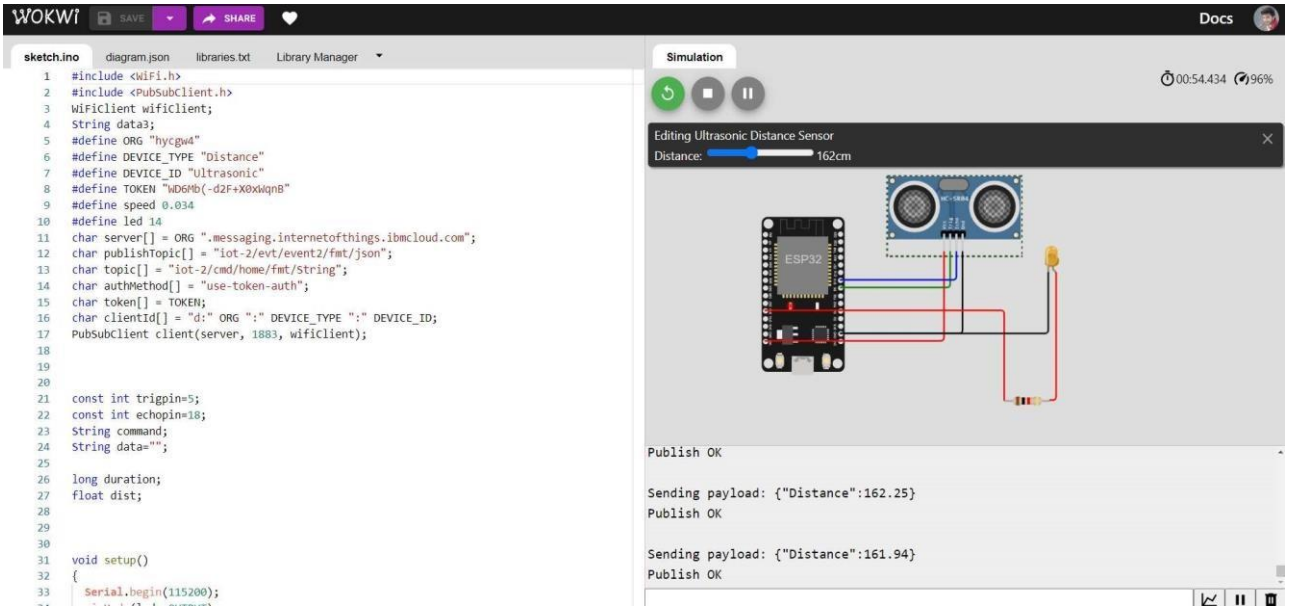
1. Distance = 95 cm Status
   = Alert Message

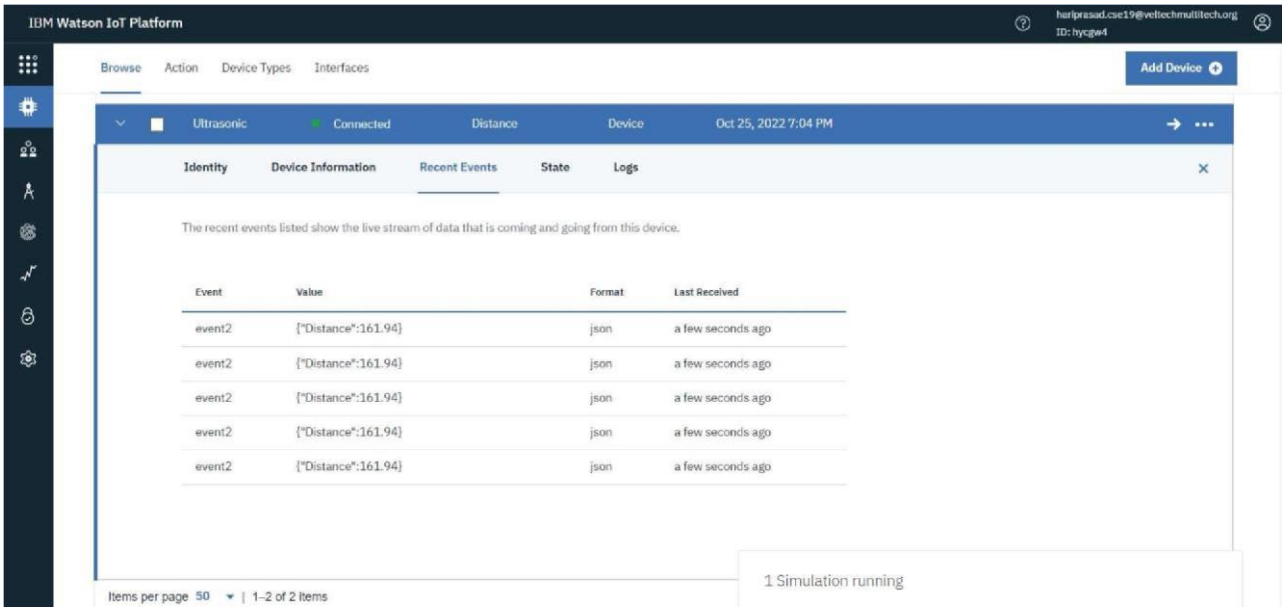




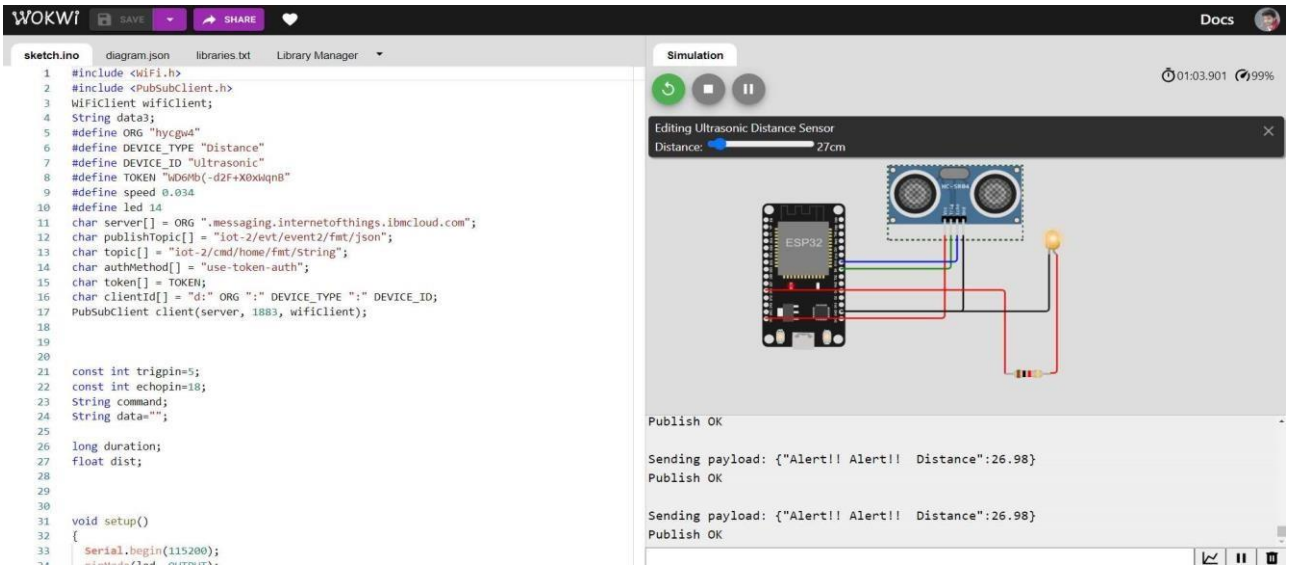
Wokwi data publishing to ibm cloud

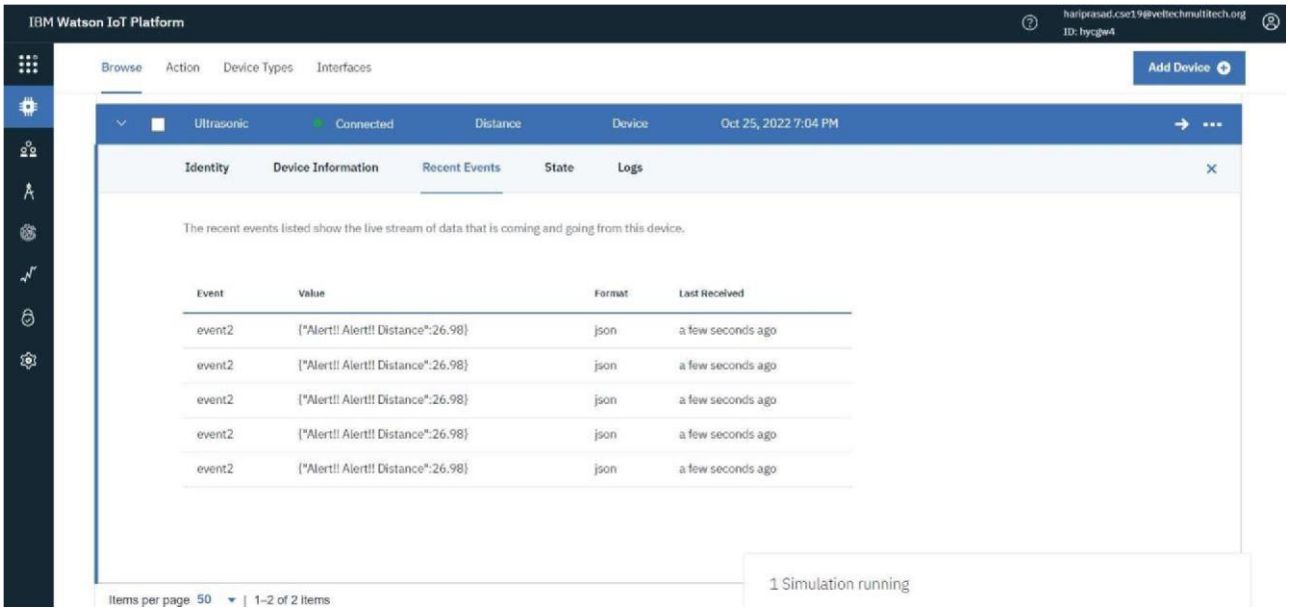
2. Distance = 162 cm Status = Normal





3. Distance = 27 cm Status
   = Alert Message





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