```
#include <WiFi.h>//library for wifi
#include <PubSubClient.h>//library for MQtt


 void callback(char* subscribetopic, byte* payload, unsigned int
 payloadLength);

 //-------credentials of IBM Accounts------

 #define ORG "f59trs"//IBM ORGANITION ID
 #define DEVICE_TYPE "ultrasonicsensor"//Device type mentioned in
 ibm watson IOT Platform
 #define DEVICE_ID "distancedetection"//Device ID mentioned in ibm
 watson IOT Platform
 #define TOKEN "AlGMGaaF01nawa1QA3"      //Token
 String data3;
 float dist;


 //-------- Customise the above values --------
 char server[] = ORG ".messaging.internetofthings.ibmcloud.com";//
 Server Name
 char publishTopic[] = "iot-2/evt/Data/fmt/json";// topic name and
 type of event perform and format in which data to be send
 char subscribetopic[] = "iot-2/cmd/test/fmt/String";//
 cmd  REPRESENT command type AND COMMAND IS TEST OF FORMAT STRING
 char authMethod[] = "use-token-auth";// authentication method
 char token[] = TOKEN;
 char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;//client
 id


 //                                                  -
```

```
WiFiClient wifiClient; // creating the instance for wificlient
PubSubClient client(server, 1883, callback ,wifiClient);
//calling the predefined client id by passing parameter like
server id,portand wificredential

int LED = 4;
int trig = 5;
int echo = 18;
void setup()
{
Serial.begin(115200);
pinMode(trig,OUTPUT);
pinMode(echo,INPUT);
pinMode(LED, OUTPUT);
delay(10);
wificonnect();
mqttconnect();
}
void loop()// Recursive Function
{

 digitalWrite(trig,LOW);
  digitalWrite(trig,HIGH);
  delayMicroseconds(10);
  digitalWrite(trig,LOW);
  float dur = pulseIn(echo,HIGH);
  float dist = (dur * 0.0343)/2;
  Serial.print ("Distancein cm");
  Serial.println(dist);


  PublishData(dist);
  delay(1000);
  if (!client.loop()) {
    mqttconnect();
  }
}



/*.....................................retrieving  to
Cloud. ............................. */

void PublishData(float dist) {
  mqttconnect();//function call for connecting to ibm
  /*
     creating the String in in form JSon to update the data to
ibm cloud
  */
```

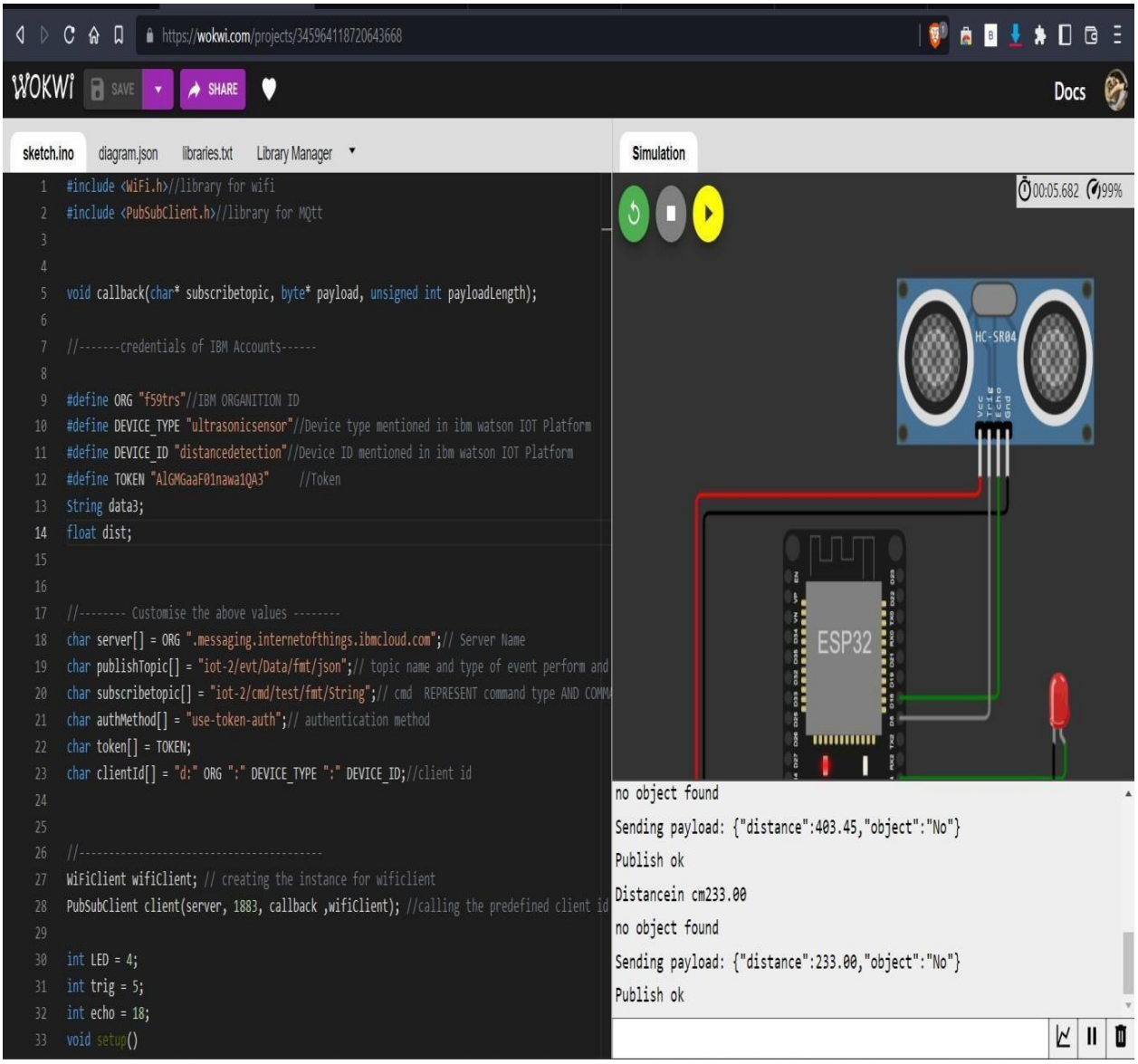
```
  String object;
  if (dist <100)
  {
    digitalWrite(LED,HIGH);
    Serial.println("object is near");
    object = "Near";
  }
  else
  {
    digitalWrite(LED,LOW);
    Serial.println("no object found");
    object = "No";
  }

  String payload = "{\"distance\":";
  payload += dist;
  payload += "," "\"object\":\"";
  payload += object;
  payload += "\"}";


  Serial.print("Sending payload: ");
  Serial.println(payload);




  if (client.publish(publishTopic, (char*) payload.c_str())) {
    Serial.println("Publish ok");// if it sucessfully upload data
on the cloud then it will print publish ok in Serial monitor or
else it will print publish failed
  } 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(500);
    }

     initManagedDevice();
     Serial.println();
  }
```

```
}
void wificonnect() //function defination for wificonnect
{
  Serial.println();
  Serial.print("Connecting to ");

  WiFi.begin("Wokwi-GUEST", "", 6);//passing the wifi credentials
to establish the connection
  while (WiFi.status() != WL_CONNECTED) {
    delay(500);
    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);
//   if(data3=="Near")
//   {
// Serial.println(data3);
// digitalWrite(LED,HIGH);

//   }

//   else
//   {
```

```
// Serial.println(data3);
// digitalWrite(LED,LOW);

//    }
data3="";


}
```

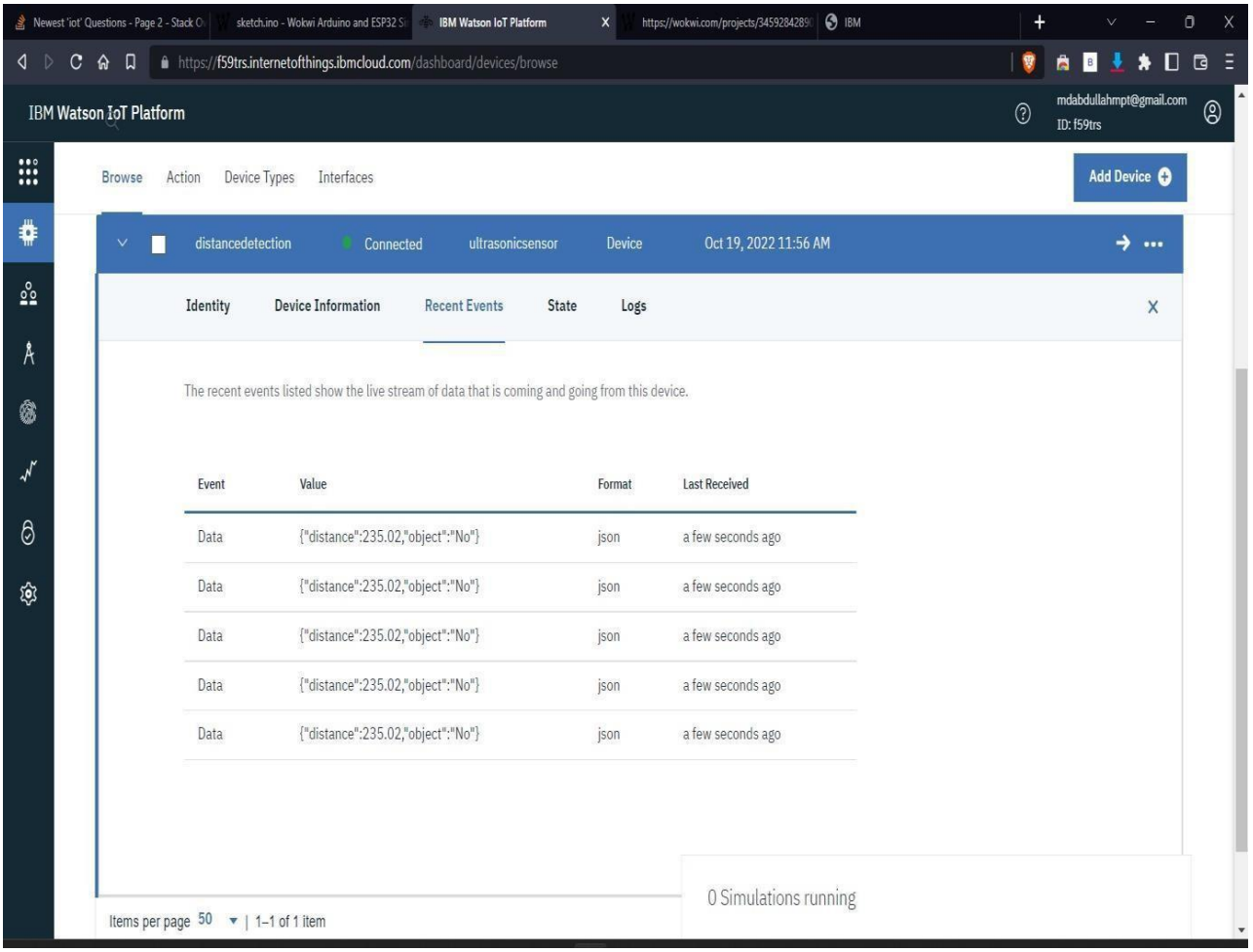
OUTPUT :

When object is not near to the ultrasonic sensor

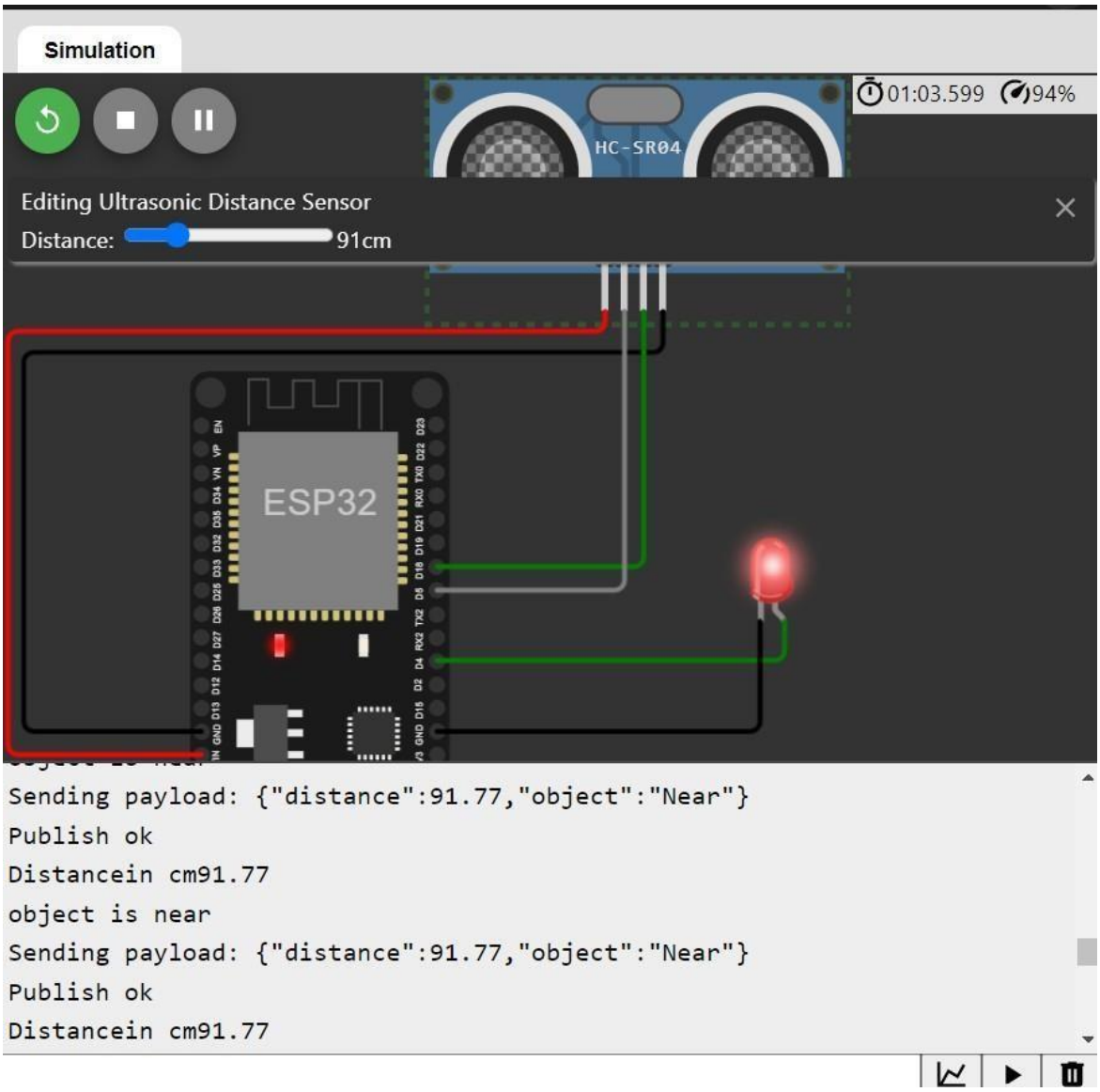



```
#include <WiFi.h>//library for wifi
#include <PubSubClient.h>//library for MQtt


void callback(char* subscribetopic, byte* payload, unsigned int payloadLength);

//-------credentials of IBM Accounts------

#define ORG "f59trs"//IBM ORGANITION ID
#define DEVICE_TYPE "ultrasonicsensor"//Device type mentioned in ibm watson IOT Platform
#define DEVICE_ID "distancedetection"//Device ID mentioned in ibm watson IOT Platform
#define TOKEN "AlGMGaaF01nawa1QA3"     //Token
String data3;
float dist;


//-------- Customise the above values --------
char server[] = ORG ".messaging.internetofthings.ibmcloud.com";// Server Name
char publishTopic[] = "iot-2/evt/Data/fmt/json";// topic name and type of event perform and
char subscribetopic[] = "iot-2/cmd/test/fmt/String";// cmd  REPRESENT command type AND COMM
char authMethod[] = "use-token-auth";// authentication method
char token[] = TOKEN;
char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;//client id


//-----------------------------------------
WiFiClient wifiClient; // creating the instance for wificlient
PubSubClient client(server, 1883, callback ,wifiClient); //calling the predefined client id

int LED = 4;
int trig = 5;
int echo = 18;
void setup()
```

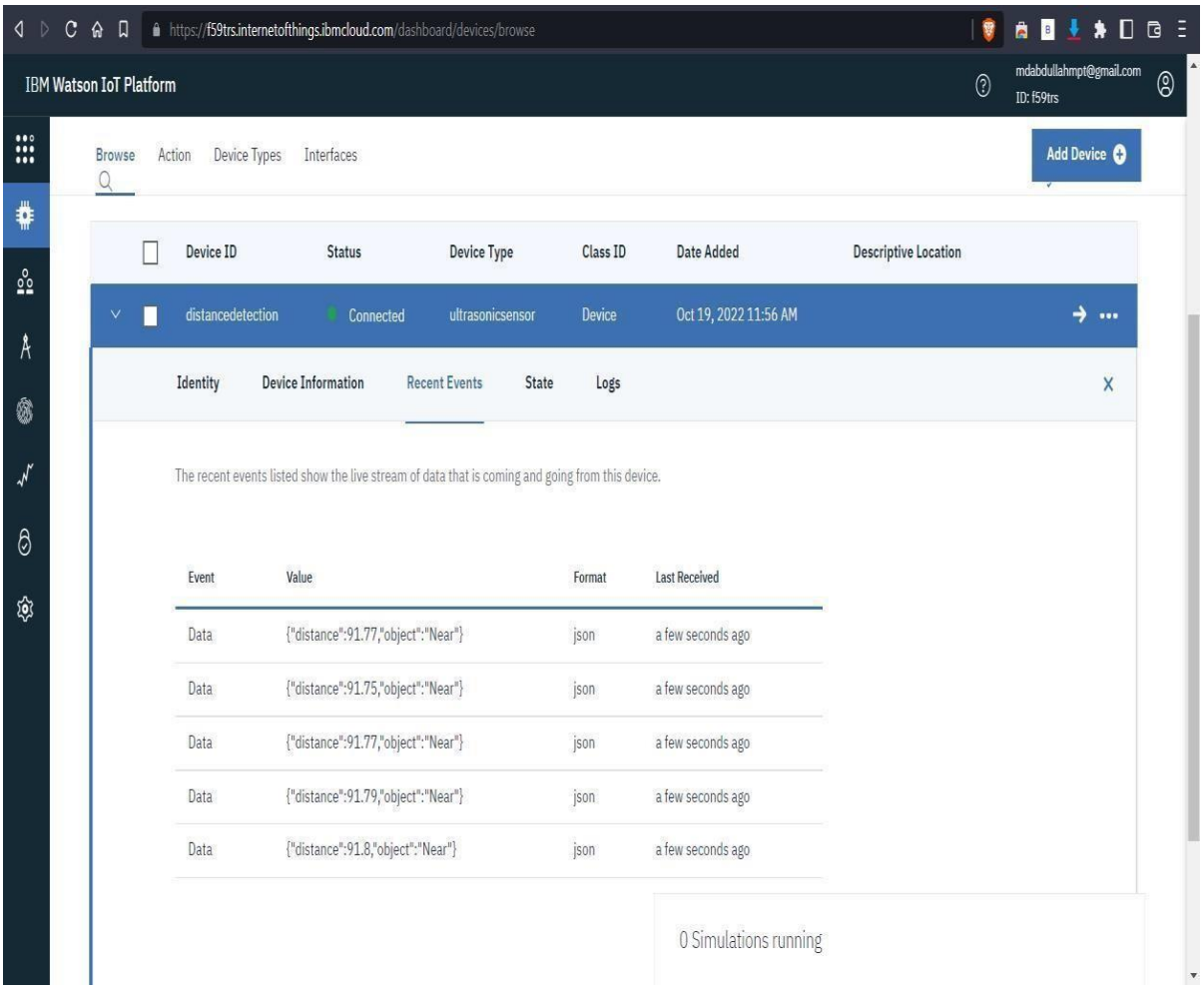
Data sent to the IBM cloud device when the object is far



When object is nearer to the ultrasonic sensor



Data sent to the IBM cloud device when the object is near



https://wokwi.com/projects/345964118720643668