ASSIGNMENT-4

ESP32 AND **ULTRASONIC SENSOR** DATA SENDS TO IBM CLOUD

PROJECT	IoT ENABLED - REAL TIME WATER QUALITY MONITORING AND CONTROL SYSTEM
NAME	GAYATHRI S
PROJECT ID	PNT2022TMID47600
DATE	22 OCT 2022

QUESTION:

Write a code and connections in wowki for the ultrasonic sensor. Whenever the distance is less than 100cms send an "alert" to IBM cloud and display in the device receive recent events. Upload documents with wowki share link and images of IBM cloud.

PROGRAM:

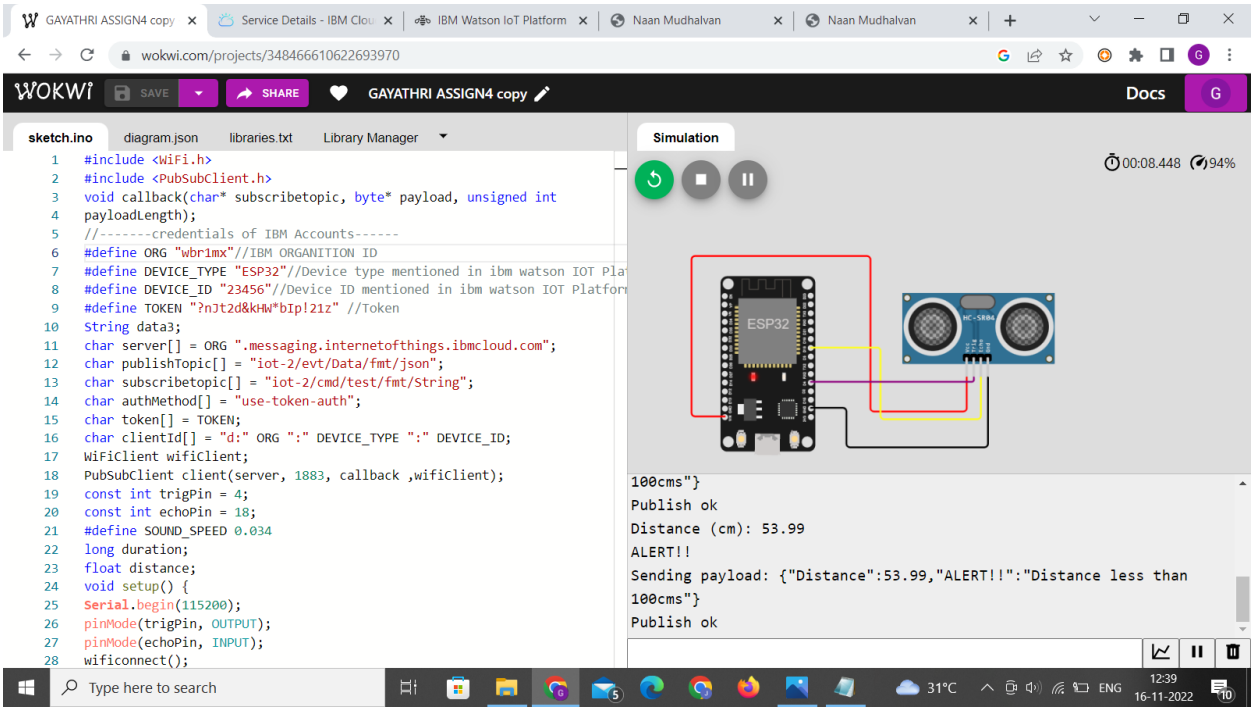
```
#include <WiFi.h>
#include <PubSubClient.h>
void callback(char* subscribetopic, byte* payload, unsigned int
payloadLength);
//-------credentials of IBM Accounts------
#define ORG "wbr1mx"//IBM ORGANITION ID
#define DEVICE_TYPE "ESP32"//Device type mentioned in ibm watson IOT Platform
```

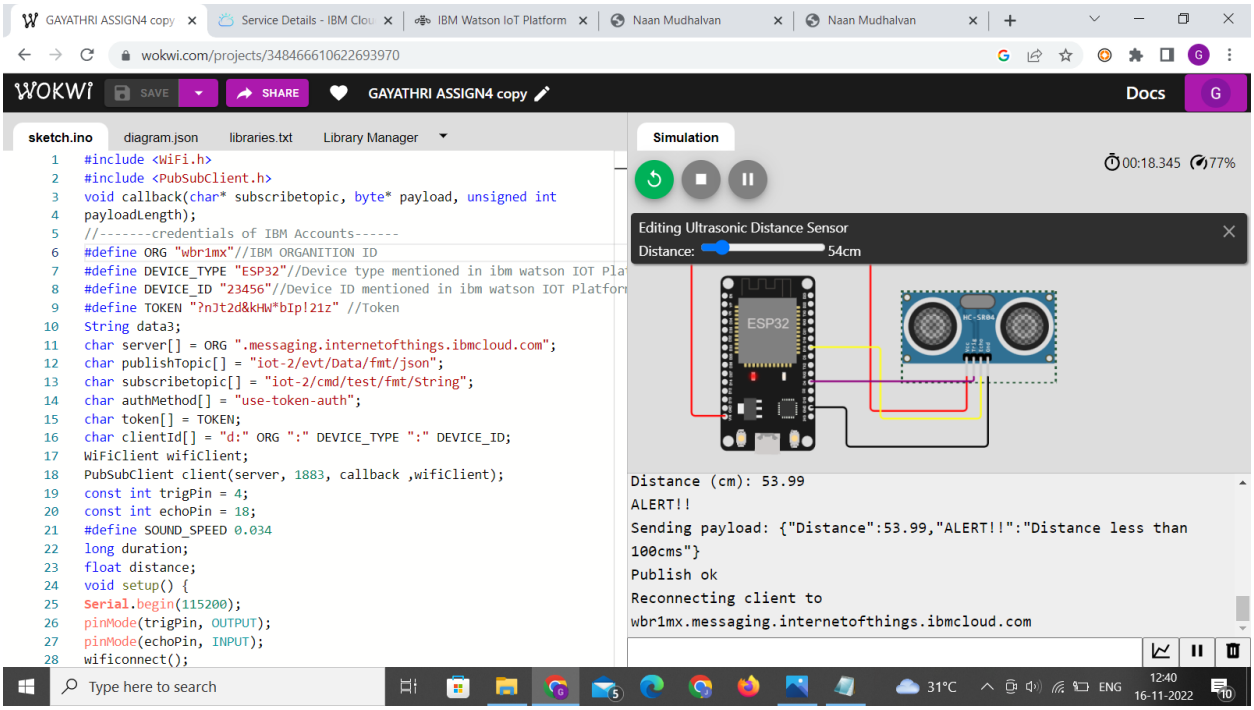
```
#define DEVICE_ID "23456"//Device ID mentioned in ibm watson IOT Platform
#define TOKEN "?nJt2d&kHW*bIp!21z" //Token
String data3;
char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
char publishTopic[] = "iot-2/evt/Data/fmt/json";
char subscribetopic[] = "iot-2/cmd/test/fmt/String";
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 = 4;
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, LOW);
delayMicroseconds(2);
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(1000);
PublishData(distance);
delay(1000);
if (!client.loop()) {
mqttconnect();
}
}
delay(1000);
```

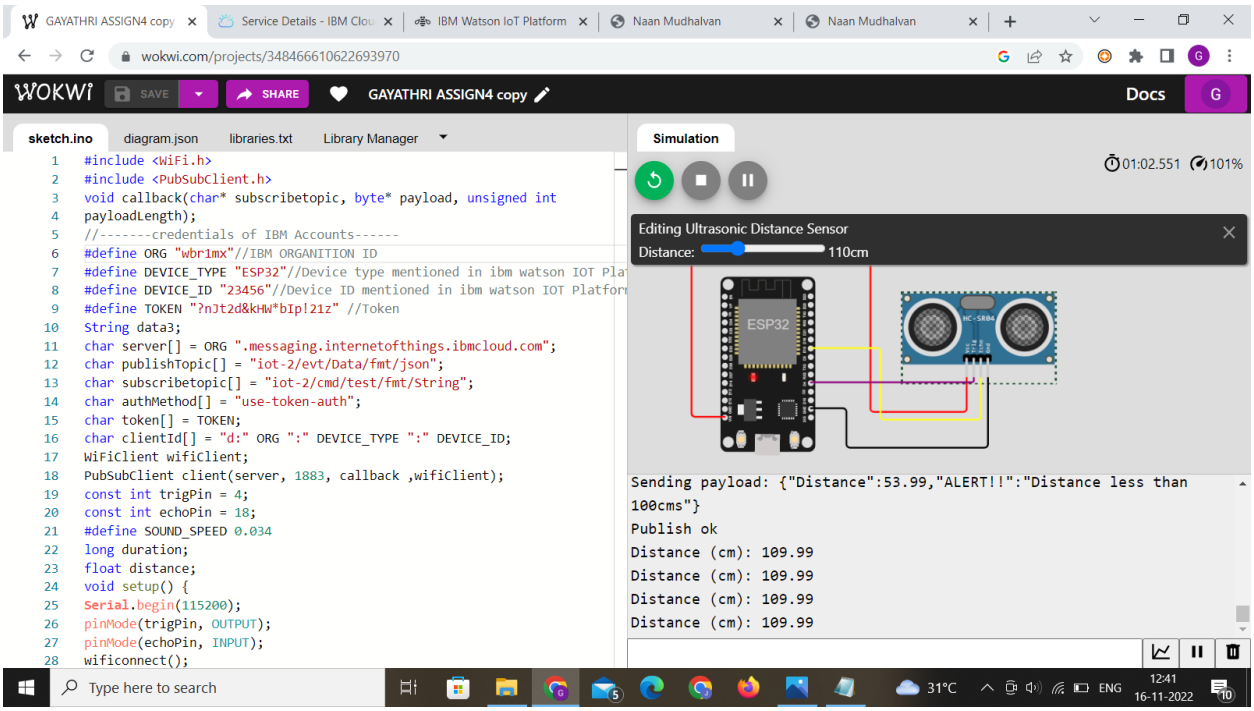
```
}
void PublishData(float dist) {
mqttconnect();
String payload = "{\"Distance\":";
payload += dist;
payload += ",\"ALERT!!\":""\"Distance less than 100cms\"";
payload += "}";
Serial.print("Sending payload: ");
Serial.println(payload);

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(500);
}
initManagedDevice();
Serial.println();
}
}
void wificonnect()
{
Serial.println();
Serial.print("Connecting to ");
WiFi.begin("Wokwi-GUEST", "", 6);
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);
data3="";
}
```

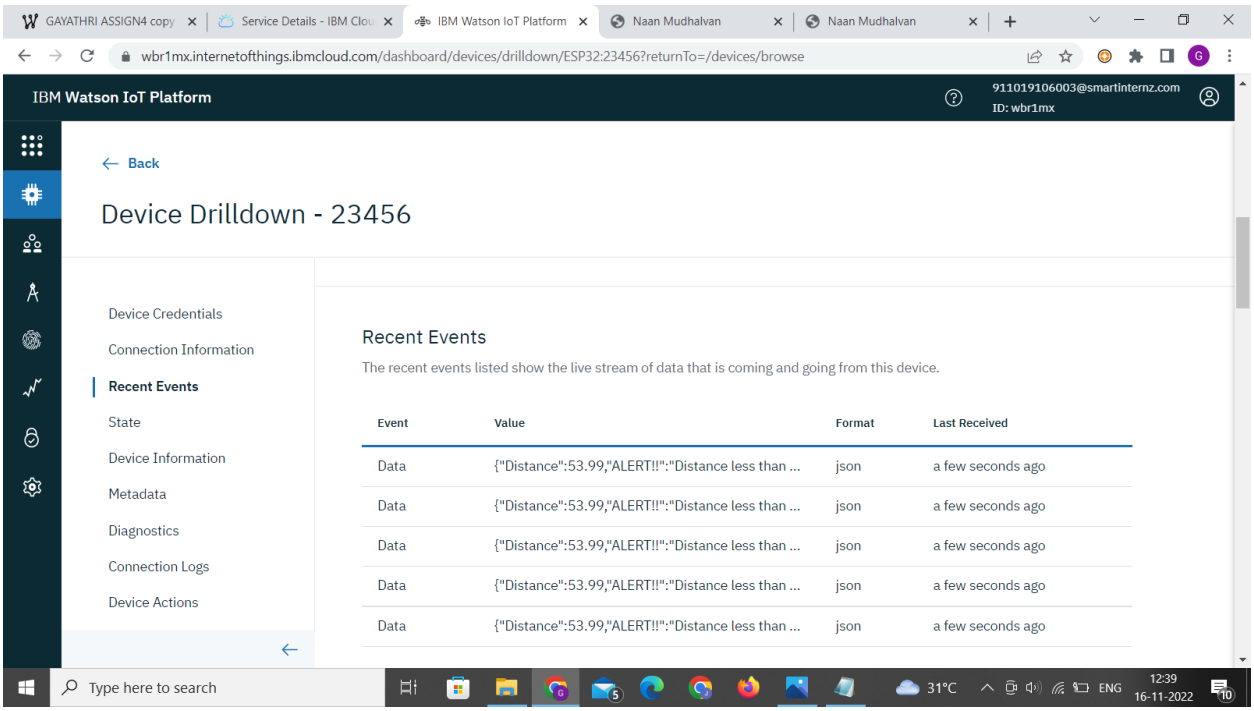
OUTPUT:

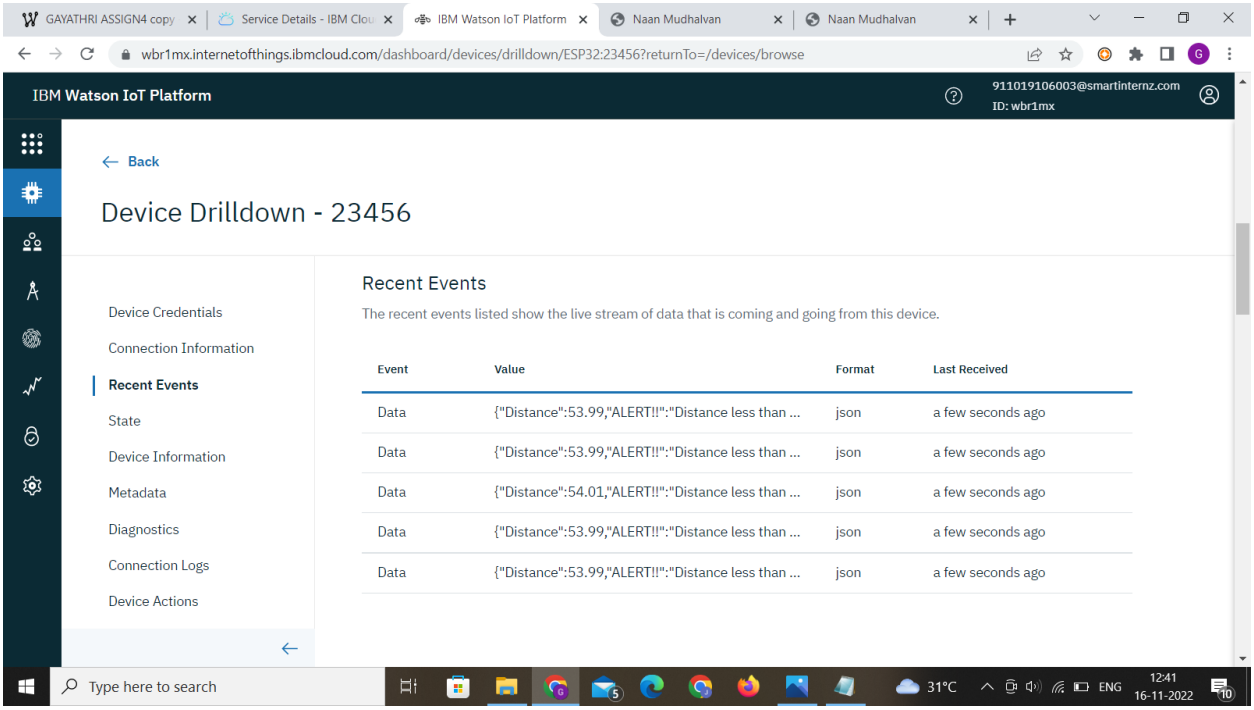


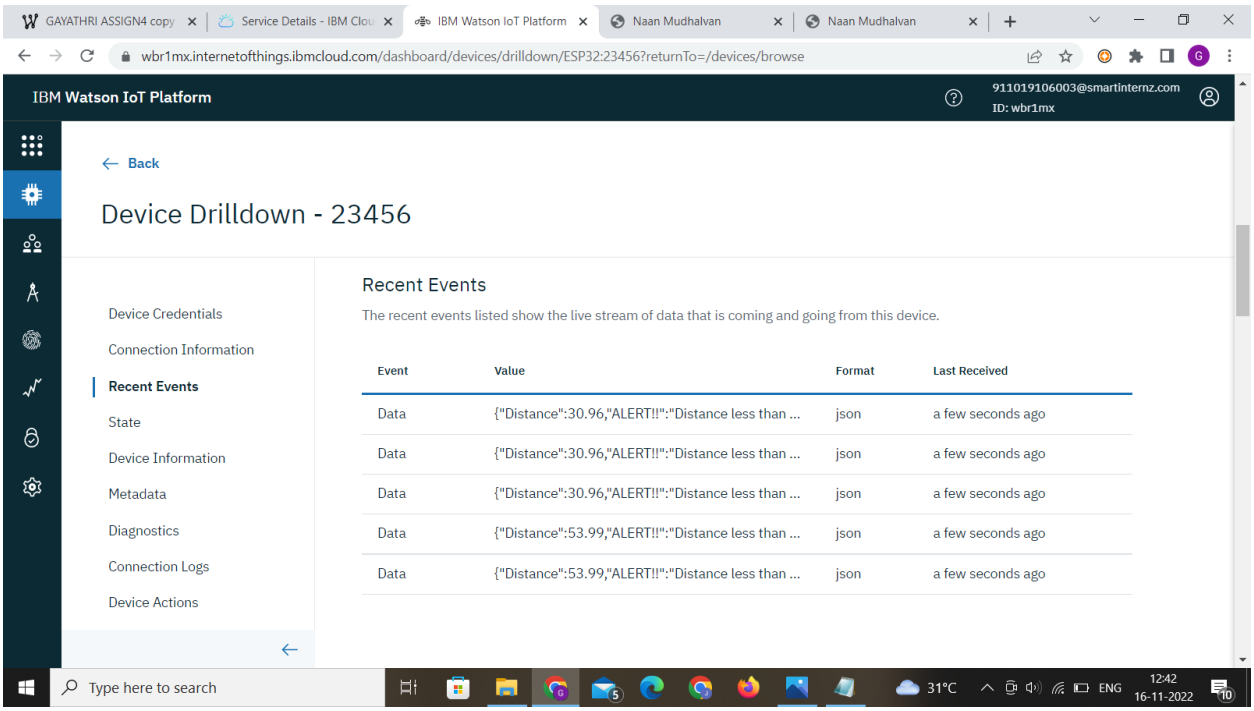

GAYATHRI ASSIGN4 copy
Service Details - IBM Clou
IBM Watson IoT Platform
Naan Mudhalvan
Naan Mudhalvan
wokwi.com/projects/348466610622693970
WOKWI
SAVE
SHARE
GAYATHRI ASSIGN4 copy
Docs
sketch.ino
diagram.json
libraries.txt
Library Manager
#include <WiFi.h>
#include <PubSubClient.h>
void callback(char* subscribetopic, byte* payload, unsigned int
payloadLength);
//-------credentials of IBM Accounts------
#define ORG "wbr1mx"//IBM ORGANITION ID
#define DEVICE_TYPE "ESP32"//Device type mentioned in ibm watson IOT Pla
#define DEVICE_ID "23456"//Device ID mentioned in ibm watson IOT Platfor
#define TOKEN "?nJt2d&kHW*bIp!21z" //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 = 4;
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();
Simulation
00:18.345
77%
Editing Ultrasonic Distance Sensor
Distance:
54cm
ESP32
HC-SR04
Distance (cm): 53.99
ALERT!!
Sending payload: {"Distance":53.99,"ALERT!!":"Distance less than
100cms"}
Publish ok
Reconnecting client to
wbr1mx.messaging.internetofthings.ibmcloud.com
Type here to search
31°C
ENG
12:40
16-11-2022



Data uploaded to IOT Watson Platform


GAYATHRI ASSIGN4 copy
Service Details - IBM Clou
IBM Watson IoT Platform
Naan Mudhalvan
Naan Mudhalvan
wbr1mx.internetofthings.ibmcloud.com/dashboard/devices/drilldown/ESP32:23456?returnTo=/devices/browse
IBM Watson IoT Platform
911019106003@smartinternz.com
ID: wbr1mx
Back
Device Drilldown - 23456
Device Credentials
Connection Information
Recent Events
State
Device Information
Metadata
Diagnostics
Connection Logs
Device Actions
Recent Events
The recent events listed show the live stream of data that is coming and going from this device.
Event
Value
Format
Last Received
Data
{"Distance":53.99,"ALERT!!":"Distance less than ...
json
a few seconds ago
Data
{"Distance":53.99,"ALERT!!":"Distance less than ...
json
a few seconds ago
Data
{"Distance":53.99,"ALERT!!":"Distance less than ...
json
a few seconds ago
Data
{"Distance":53.99,"ALERT!!":"Distance less than ...
json
a few seconds ago
Data
{"Distance":53.99,"ALERT!!":"Distance less than ...
json
a few seconds ago
Type here to search
31°C
ENG
12:39
16-11-2022


GAYATHRI ASSIGN4 copy
Service Details - IBM Clou
IBM Watson IoT Platform
Naan Mudhalvan
Naan Mudhalvan
wbr1mx.internetofthings.ibmcloud.com/dashboard/devices/drilldown/ESP32:23456?returnTo=/devices/browse
IBM Watson IoT Platform
911019106003@smartinternz.com
ID: wbr1mx
Back
Device Drilldown - 23456
Device Credentials
Connection Information
Recent Events
State
Device Information
Metadata
Diagnostics
Connection Logs
Device Actions
Recent Events
The recent events listed show the live stream of data that is coming and going from this device.
Event
Value
Format
Last Received
Data
{"Distance":53.99,"ALERT!!":"Distance less than ...
json
a few seconds ago
Data
{"Distance":53.99,"ALERT!!":"Distance less than ...
json
a few seconds ago
Data
{"Distance":54.01,"ALERT!!":"Distance less than ...
json
a few seconds ago
Data
{"Distance":53.99,"ALERT!!":"Distance less than ...
json
a few seconds ago
Data
{"Distance":53.99,"ALERT!!":"Distance less than ...
json
a few seconds ago
Type here to search
31°C
ENG
12:41
16-11-2022



https://wokwi.com/projects/348466610622693970