ASSIGNMENT 4

Assignment Date	23 October 2022
Team ID	PNT2022TMID37162
Project Name	Smart Waste Management System for Metropolitan Cities
Assignment Question	Write code and connections in Wokwi for the ultrasonic sensor. Whenever the distance is less than 100 CM send an "alert" to the IBM cloud and display in the device recent events. Upload document with Wokwi share link and images of IBM cloud.
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CODING:-

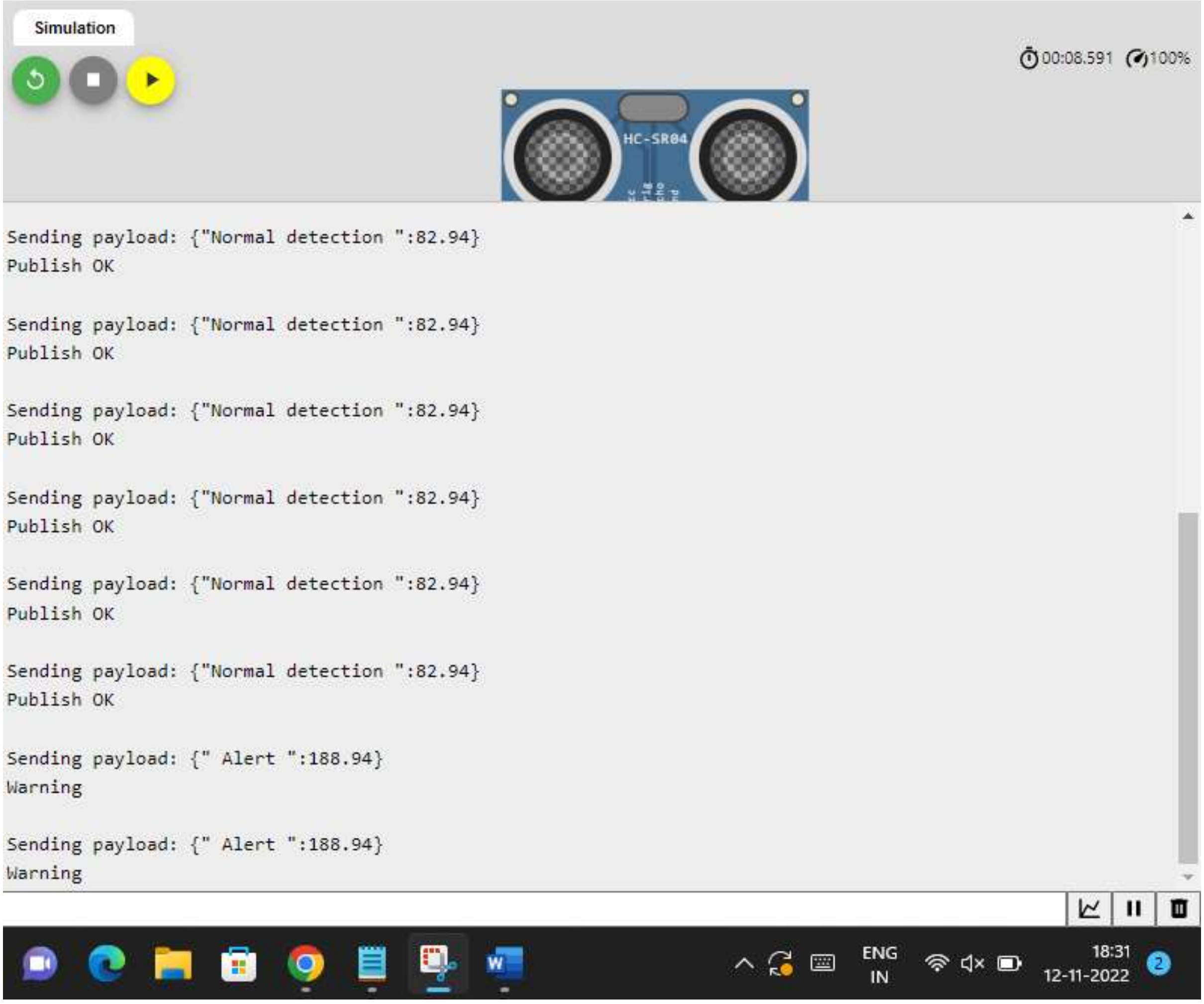
```
#include <WiFi.h>

#include <PubSubClient.h>

WiFiClient wifiClient;

String data3;

#define ORG "mfy87c"

#define DEVICE_TYPE "wowki"

#define DEVICE_ID "1256"

#define TOKEN "12345678"

#define speed 0.034

#define led 14

char server[] = ORG ".messaging.internetofthings.ibmcloud.com";

char publishTopic[] = "iot-2/evt/event/fmt/json";

char topic[] = "iot-2/cmd/led/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("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;
```

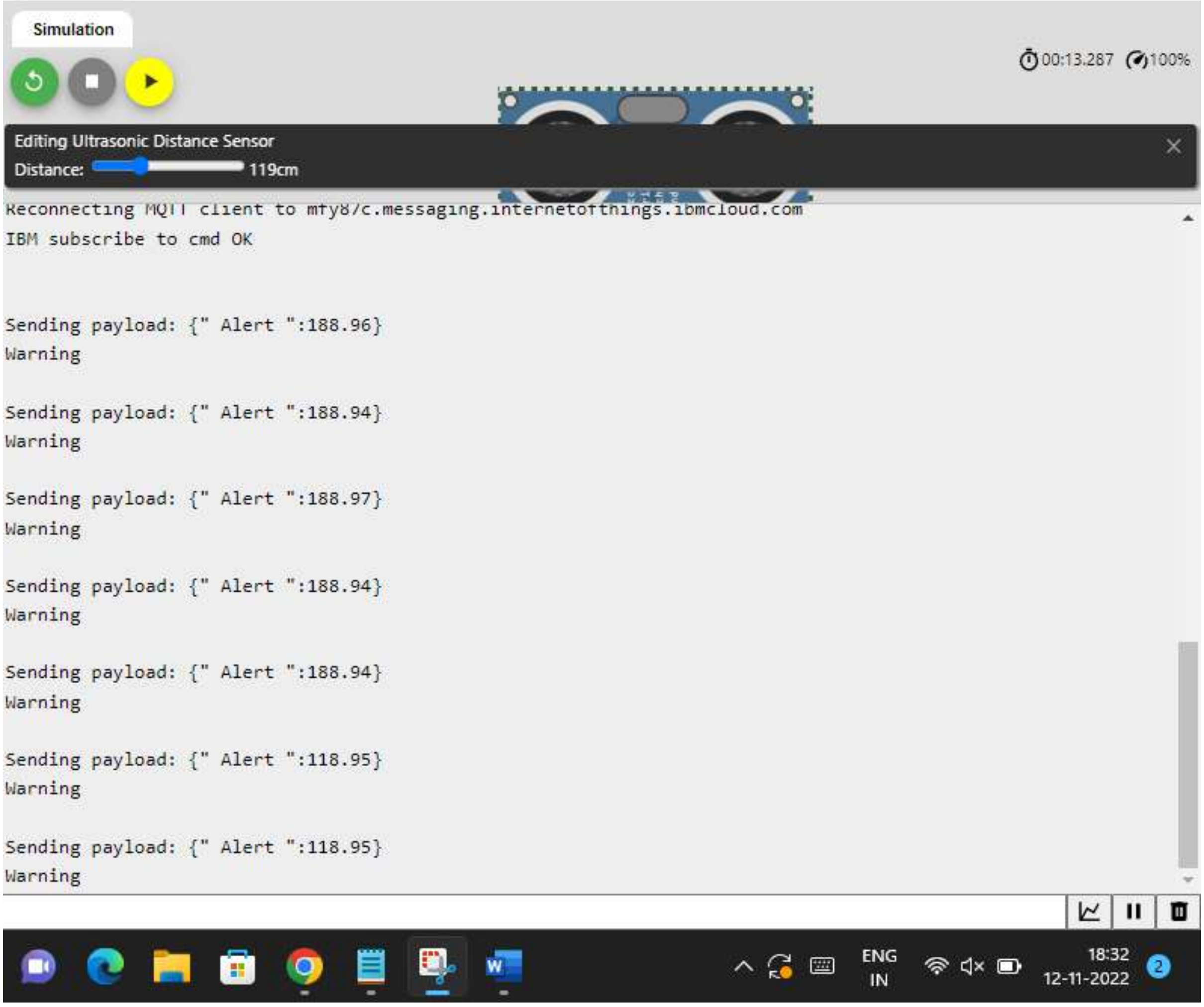
```
if(dist<100){
String payload = "{\"Normal detection \":";
payload += dist;
payload += "}";
Serial.print("\n");
Serial.print("Sending payload: ");
Serial.println(payload);
if (client.publish(publishTopic, (char*) payload.c_str())) {
Serial.println("Publish OK");
}
}
if(dist>100){
String payload = "{\" Alert \":";
payload += dist;
payload += "}";
Serial.print("\n");
Serial.print("Sending payload: ");
Serial.println(payload);
if(client.publish(publishTopic, (char*) payload.c_str())) {
Serial.println("Warning");
}else {
Serial.println("Publish FAILED");
}
}
}
void callback(char* subscribeTopic,byte* payload,unsigned int payloadLenght){
  Serial.print("callback invoked for topic");
  Serial.println(subscribeTopic);
  for(int i=0;i<payloadLenght;i++){
    dist+=(char)payload[i];
```

```
 }
 Serial.println("data:"+data3);
 if(data3=="lighton"){
   Serial.println(data3);
   digitalWrite(led,HIGH);
 }
 data3="";
}
```

WOWKI OUTPUT:-

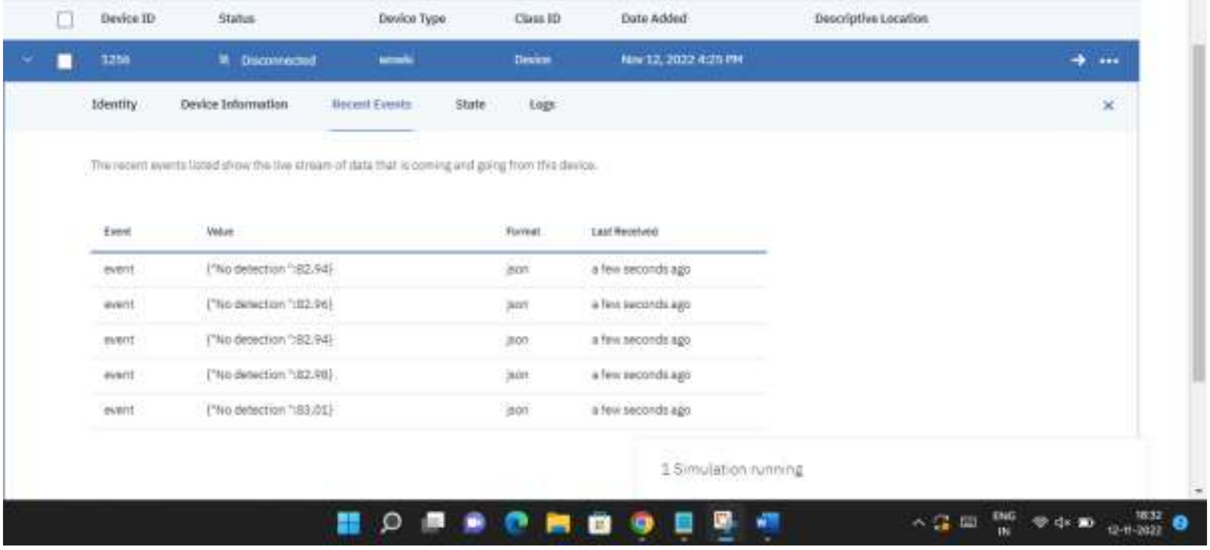


```
Sending payload: {"Normal detection ":82.94}
Publish OK

Sending payload: {"Normal detection ":82.94}
Publish OK

Sending payload: {"Normal detection ":82.94}
Publish OK

Sending payload: {"Normal detection ":82.94}
Publish OK

Sending payload: {"Normal detection ":82.94}
Publish OK

Sending payload: {"Normal detection ":82.94}
Publish OK

Sending payload: {" Alert ":188.94}
Warning

Sending payload: {" Alert ":188.94}
Warning
```



```
Reconnecting MQTT client to mfy87c.messaging.internetofthings.ibmcloud.com
IBM subscribe to cmd OK


Sending payload: {" Alert ":188.96}
Warning

Sending payload: {" Alert ":188.94}
Warning

Sending payload: {" Alert ":188.97}
Warning

Sending payload: {" Alert ":188.94}
Warning

Sending payload: {" Alert ":188.94}
Warning

Sending payload: {" Alert ":118.95}
Warning

Sending payload: {" Alert ":118.95}
Warning
```

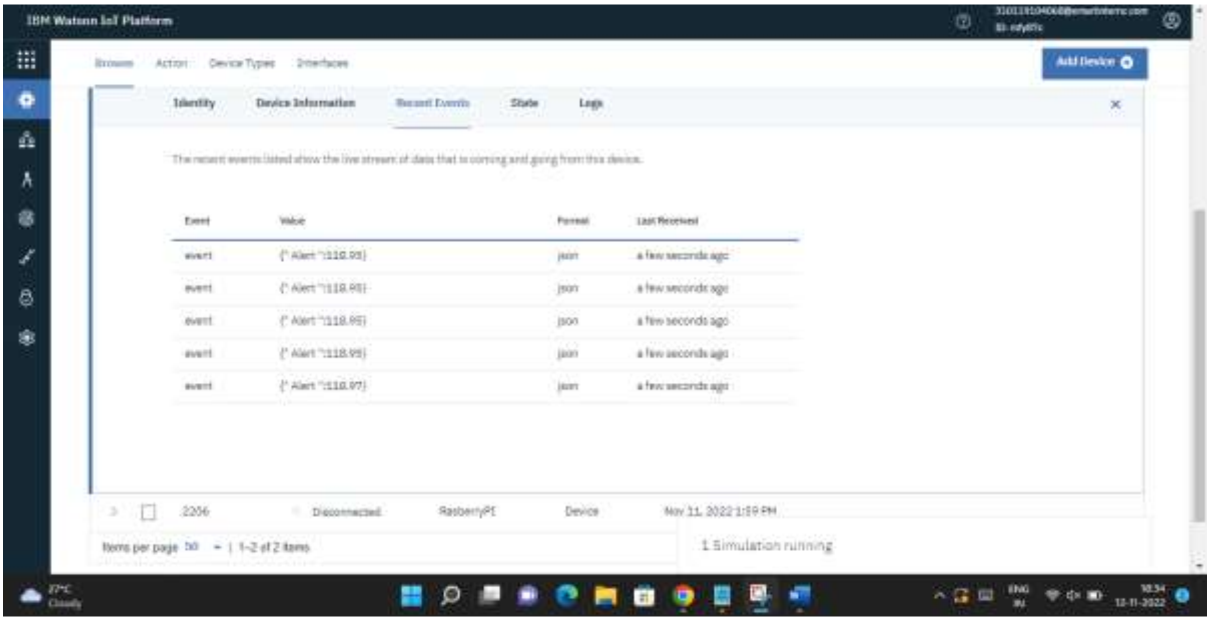
IBM CLOUD OUTPUT:-



Device ID	Status	Device Type	Class ID	Date Added	Descriptive Location
1256	Disconnected	[illegible]	Device	Nov 12, 2022 4:25 PM	

The recent events listed show the live stream of data that is coming and going from this device.

Event	Value	Format	Last Received
event	{"No detection ":82.94}	json	a few seconds ago
event	{"No detection ":82.96}	json	a few seconds ago
event	{"No detection ":82.94}	json	a few seconds ago
event	{"No detection ":82.98}	json	a few seconds ago
event	{"No detection ":83.01}	json	a few seconds ago



IBM Watson IoT Platform

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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	{" Alert ":118.95}	json	a few seconds ago
event	{" Alert ":118.95}	json	a few seconds ago
event	{" Alert ":118.95}	json	a few seconds ago
event	{" Alert ":118.95}	json	a few seconds ago
event	{" Alert ":118.97}	json	a few seconds ago

2206 Disconnected RasberryPI Device Nov 11, 2022 1:59 PM

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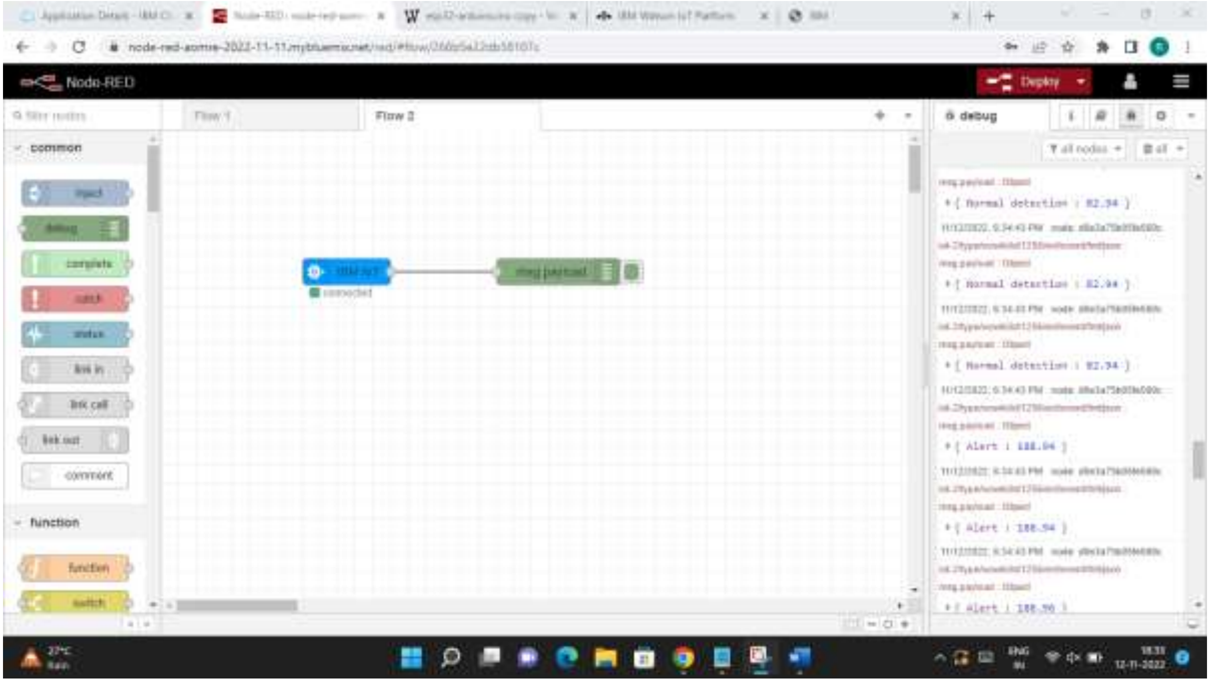
1 Simulation running

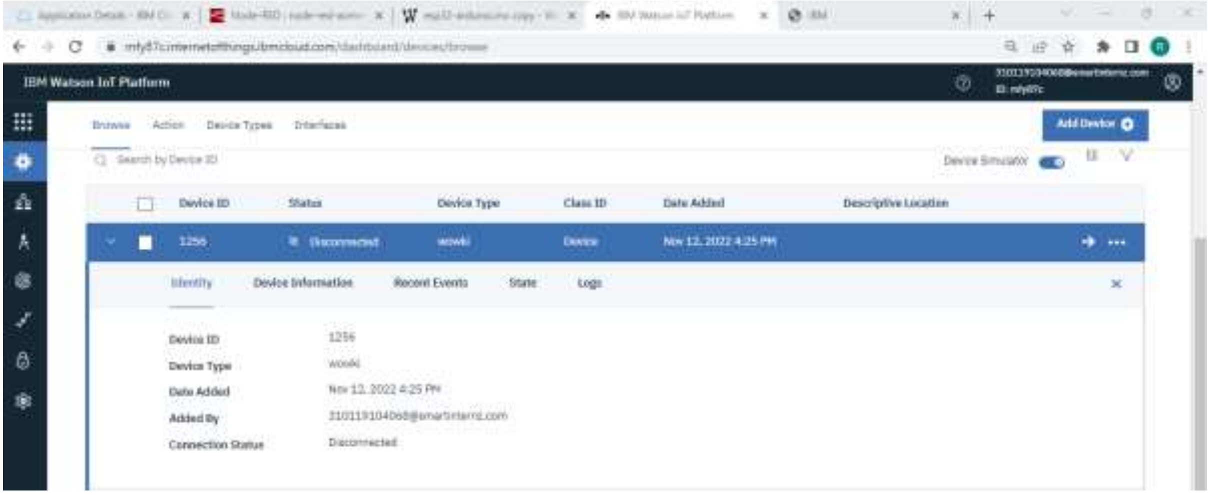
NODE RED OUTPUT :-



node-red-aomre-2022-11-11.mybluemix.net/red/#flow/

```
msg.payload : Object
▸{ Normal detection : 82.34 }
11/12/2022, 6:34:43 PM node: [illegible]
msg.payload : Object
▸{ Normal detection : 82.34 }
11/12/2022, 6:34:43 PM node: [illegible]
msg.payload : Object
▸{ Normal detection : 82.34 }
11/12/2022, 6:34:43 PM node: [illegible]
msg.payload : Object
▸{ Alert : 188.94 }
11/12/2022, 6:34:43 PM node: [illegible]
msg.payload : Object
▸{ Alert : 188.94 }
11/12/2022, 6:34:43 PM node: [illegible]
msg.payload : Object
▸{ Alert : 188.96 }
```

DEVICE INFORMATION:-



Device ID	Status	Device Type	Class ID	Date Added	Descriptive Location
1256	Disconnected	wowki	Device	Nov 12, 2022 4:25 PM	

Device ID 1256

Device Type wowki

Date Added Nov 12, 2022 4:25 PM

Added By 310119104068@smartinternz.com

Connection Status Disconnected

WOWKI SHARE LINK:-

https://wokwi.com/projects/348118962400133715