ASSIGNMENT – 4

Date	11 November 2022
Team ID	PNT2022TMID30897
Project Name	GAS LEAKAGE MONITORING AND ALERTING SYSTEM FOR INDUSTRIES

QUESTION:

Write code and connection in wokwi for ultrasonic sensors.That whenever distance is less than 100cms send "alert" to IBM Cloud and display in device recent events.

Upload document with wokwi share link and images.

Wokwi :

https://wokwi.com/projects/348204126867292755

CODE:

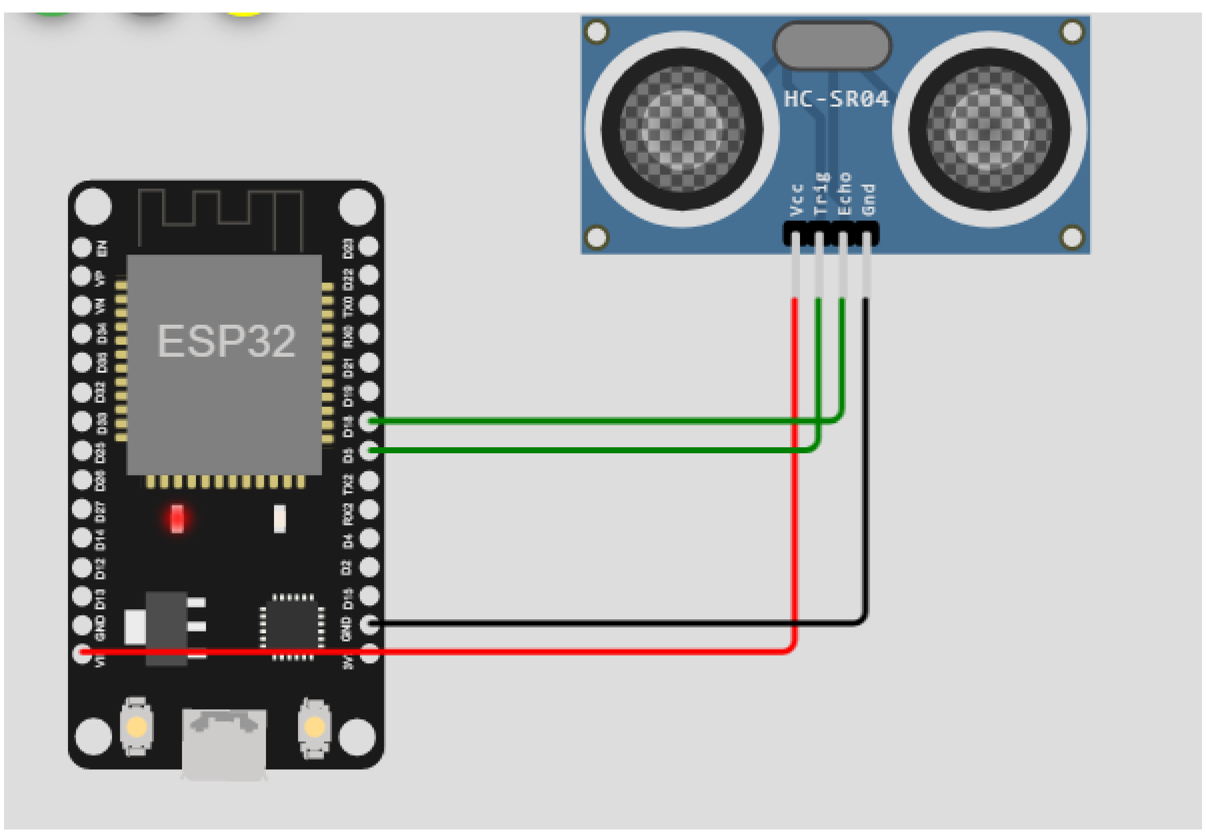
```
#include <WiFi.h>
#include <PubSubClient.h>

WiFiClient wifiClient;

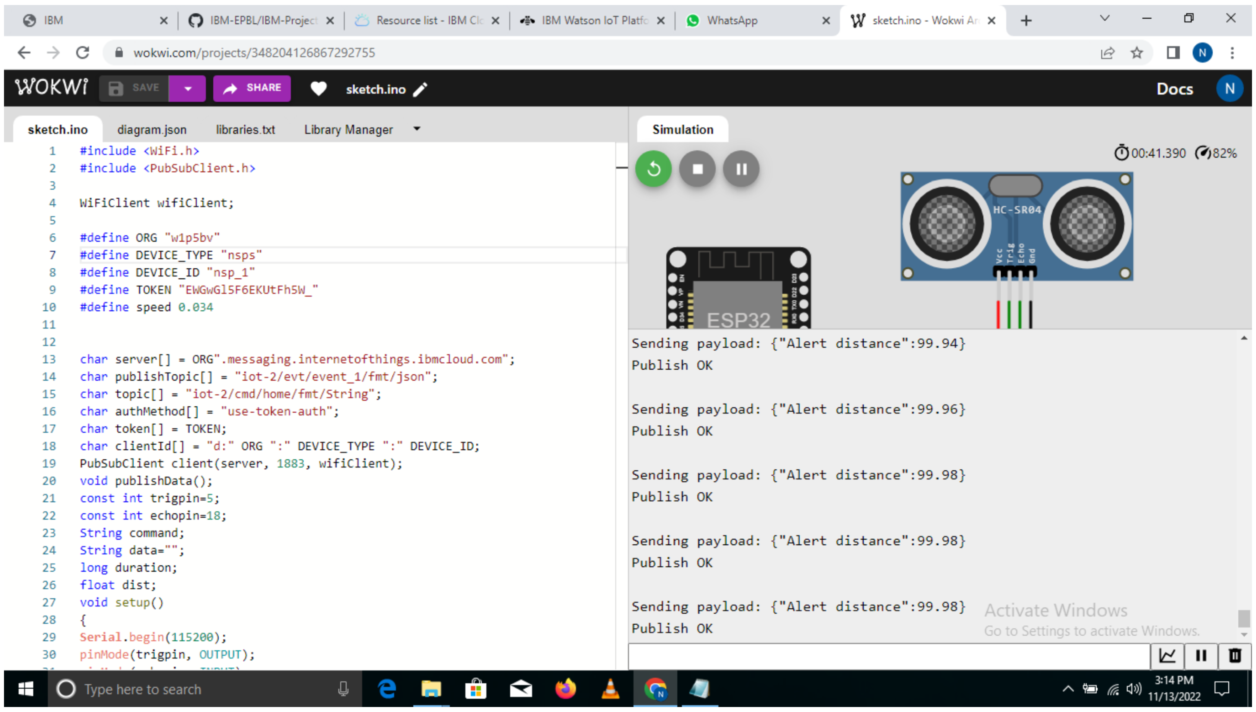
#define ORG "w1p5bv"
#define DEVICE_TYPE "nsps"
#define DEVICE_ID "nsp_1"
#define TOKEN "EWGwGl5F6EKUtFh5W_"
#define speed 0.034
```

```
char server[] = ORG".messaging.internetofthings.ibmcloud.com";
char publishTopic[] = "iot-2/evt/event_1/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);
void publishData();
const int trigpin=5;
const int echopin=18;
String command;
String data="";
long duration;
float dist;
void setup()
{
Serial.begin(115200);
pinMode(trigpin, OUTPUT);
pinMode(echopin, INPUT);
wifiConnect();
mqttConnect();
}
void loop() {
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("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 = "{\"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");
} else {
Serial.println("Publish FAILED");
}
}
}
```

DIAGRAM:


HC-SR04
Vcc
Trig
Echo
Gnd
ESP32
EN
VP
VN
D34
D35
D32
D33
D25
D26
D27
D14
D12
D13
GND
VIN
D23
D22
TX0
RX0
D21
D19
D18
D5
TX2
RX2
D4
D2
D15
GND
3V3

Wokwi Output:



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void publishData();
const int trigpin=5;
const int echopin=18;
String command;
String data="";
long duration;
float dist;
void setup()
{
Serial.begin(115200);
pinMode(trigpin, OUTPUT);
```

```
Sending payload: {"Alert distance":99.94}
Publish OK

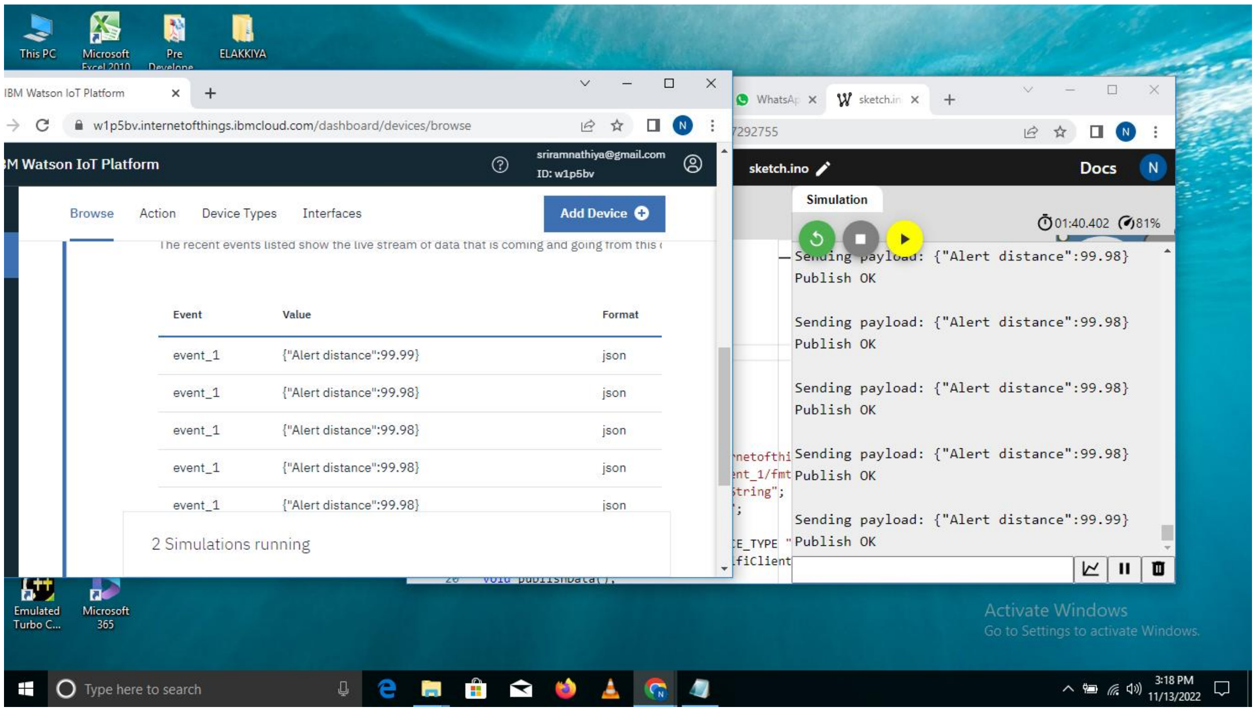
Sending payload: {"Alert distance":99.96}
Publish OK

Sending payload: {"Alert distance":99.98}
Publish OK

Sending payload: {"Alert distance":99.98}
Publish OK

Sending payload: {"Alert distance":99.98}
Publish OK
```

IBM CLOUD OUTPUT:



w1p5bv.internetofthings.ibmcloud.com/dashboard/devices/browse

Event	Value	Format
event_1	{"Alert distance":99.99}	json
event_1	{"Alert distance":99.98}	json
event_1	{"Alert distance":99.98}	json
event_1	{"Alert distance":99.98}	json
event_1	{"Alert distance":99.98}	json

2 Simulations running

```
Sending payload: {"Alert distance":99.98}
Publish OK

Sending payload: {"Alert distance":99.98}
Publish OK

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Publish OK

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Publish OK

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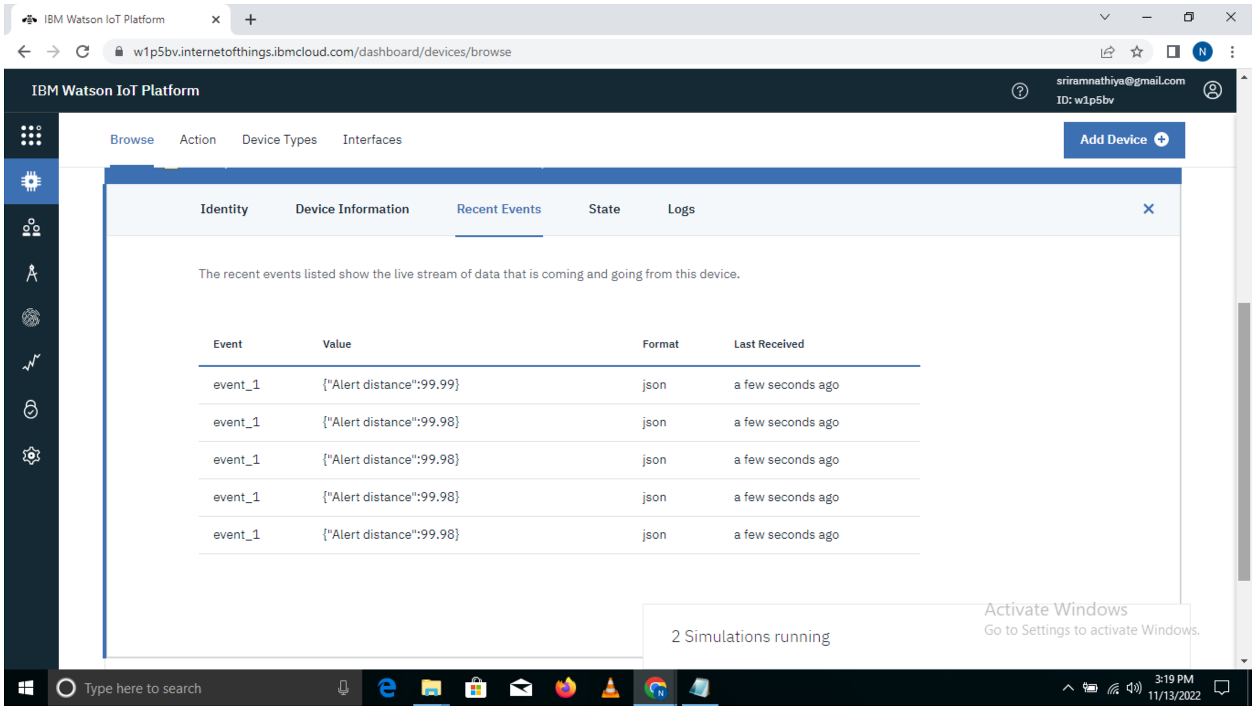
Publish OK
```



w1p5bv.internetofthings.ibmcloud.com/dashboard/devices/browse

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

Event	Value	Format	Last Received
event_1	{"Alert distance":99.99}	json	a few seconds ago
event_1	{"Alert distance":99.98}	json	a few seconds ago
event_1	{"Alert distance":99.98}	json	a few seconds ago
event_1	{"Alert distance":99.98}	json	a few seconds ago
event_1	{"Alert distance":99.98}	json	a few seconds ago

2 Simulations running