ASSIGNMENT 4

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TEAM ID	PNT2022TMID22325
PROJECT NAME	Signs with Smart Connectivity for Better Road Safety

Write code and connections in wokwi for ultrasonic sensor. Whenever distance is less than 100 cms send "alert" to IBM cloud and display in device recent events

```cpp
#include <WiFi.h>
#include <PubSubClient.h>
WiFiClient wifiClient;
String data3;
#define ORG "c0mbt9"
#define DEVICE_TYPE "Node"
#define DEVICE_ID "1234"
#define TOKEN "987654321"
#define speed 0.034  #define
led 14

char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
char publishTopic[] = "iot-2/evt/shanmugam_assignment4/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);
```
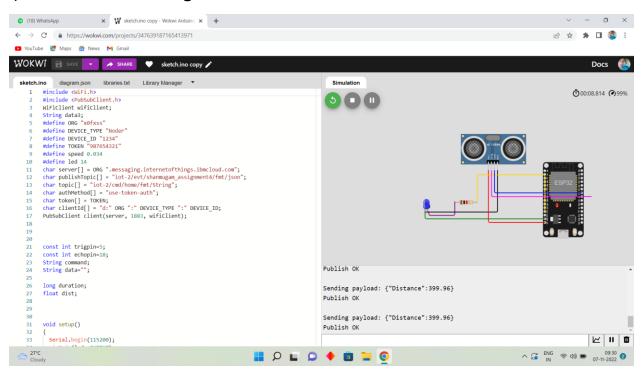
```cpp
const int trigpin=5; const
int echopin=18; String
command; String
data="";


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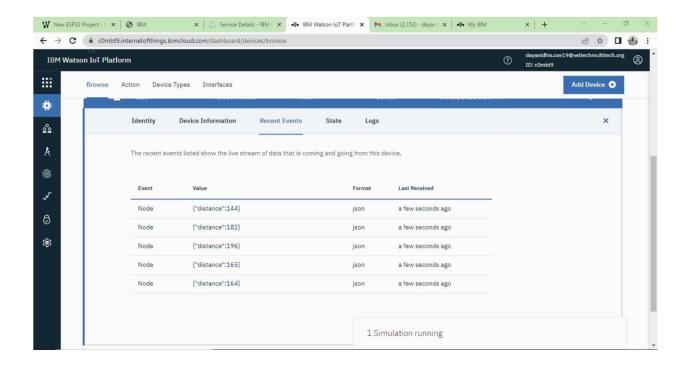
```cpp
void wifiConnect() {
  Serial.print("Connecting to "); Serial.print("Wifi");
  WiFi.begin("Wokwi-GUEST", "", 6);
  while (WiFi.status() != WL_CONNECTED) {
    delay(500);
    Serial.print(".");
  }
  Serial.print("WiFi connected, IP address: "); Serial.println(WiFi.localIP());
}


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);
```

```cpp
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");
  }

}
  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");
  }

}
```
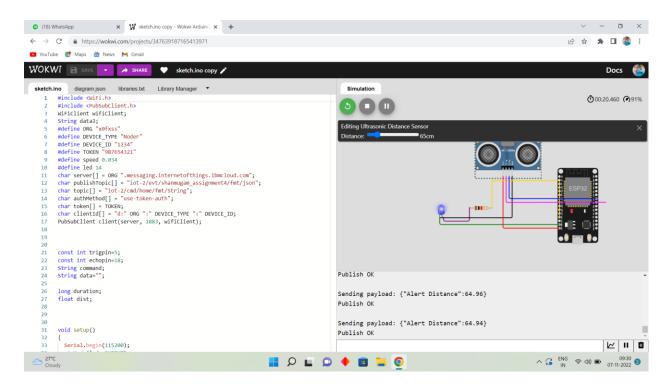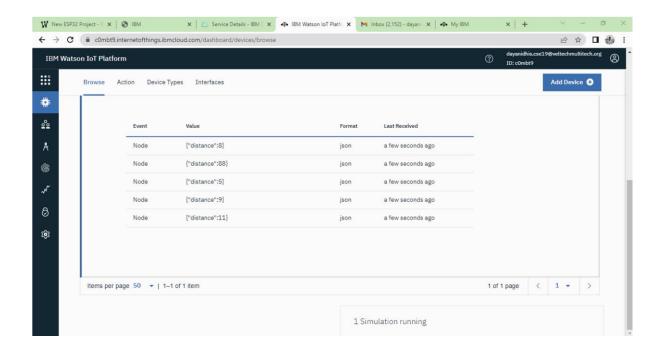
}

OUTPUT:

i)   When distance greater than 100 cm

ii)When distance less than 100

WOKWI LINK –

https://wokwi.com/projects/347639187165413971