

## Assignment 4:

*Write code and connections in wokwi for the ultrasonic sensor. Whenever the distance is less than 100 cms 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.*

```
#include <WiFi.h>
#include <PubSubClient.h>
#include <ArduinoJson.h>
WiFiClient wifiClient;
#define ORG "dzlyo8"
#define DEVICE_TYPE "device1"
#define DEVICE_ID "akilan"
#define TOKEN "123456789"
#define speed 0.034
char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
char publishTopic[] = "iot-2/evt/Data/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;
int 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(1000);
}
}
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){
DynamicJsonDocument doc(1024);
String payload;
doc["Distance Alert:"]=dist;
serializeJson(doc, payload);
delay(300);
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");
}
}}

```

**WOKWI LINK:**

<https://wokwi.com/projects/348214014005740115>

## OUTPUT:

```
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3 #include <ArduinoJson.h>
4 WiFiClient wifiClient;
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6 #define DEVICE_TYPE "device1"
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10 char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
11 char publishTopic[] = "iot-2/evt/Data/fmt/json";
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13 char authMethod[] = "use-token-auth";
14 char token[] = TOKEN;
15 char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;
16 PubSubClient client(server, 1883, wifiClient);
17 void publishData();
18 const int trigpin=5;
19 const int echopin=18;
20 String command;
21 String data="";
22 long duration;
23 int dist;
24 void setup()
25 {
26   Serial.begin(115200);
27   pinMode(trigpin, OUTPUT);
28   pinMode(echopin, INPUT);
29   wifiConnect();
30 }
```

Simulation

00:50.230 100%

ESP32 HC-SR04

Publish OK

Sending payload: {"Distance Alert":75}

Publish OK

Sending payload: {"Distance Alert":75}

Publish OK

## CLOUD OUTPUT:

IBM Watson IoT Platform

Assignment-4 - Wokwi Arduino x IBM Watson IoT Platform

dzlyo8.internetofthings.ibmcloud.com/dashboard/devices/drilldown/device1:akilan?returnTo=/devices/browse

antro180@gmail.com ID: dzlyo8

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### Device Drilldown - akilan

Connection Information

Recent Events

Event	Value	Format	Last Received
Data	{"Distance Alert":75}	json	a few seconds ago
Data	{"Distance Alert":75}	json	a few seconds ago
Data	{"Distance Alert":68} {"Distance Alert":75}	json	a few seconds ago
Data	{"Distance Alert":86}	json	a few seconds ago
Data	{"Distance Alert":86}	json	a few seconds ago

State

This table shows a list of data points that are reported by this device.