

Assignment -4

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Question-1:

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.

Program:

```
i#include <WiFi.h>

#include <PubSubClient.h>

//----- credentials of IBM Accounts -----

#define ORG "qwErv"

#define DEVICE_TYPE "device_1"

#define DEVICE_ID "iot"

#define TOKEN "1234567"

#define speed 0.034

#define led 14

String data3;

int LED = 4;

//----- customise above values -----

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

char publishTopic[] = "iot-
2/evt/sreedhar/fmt/json";           //
topic name and type of event perform and
format in which data to be send

char topic[] = "iot-2/cmd/led/fmt/String";
// cmd Represent type and command is test
format of strings

char authMethod[] = "use-token-auth";
// authentication method

char token[] = TOKEN;
```

```

char clientId[] = "d:" ORG ":" DEVICE_TYPE
":" DEVICE_ID;

//-----

WiFiClient wifiClient;
// creating instance for wificlient
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();
    // function call to connect to ibm
  }
}

```

```

/* -----retrieving to cloud-----*/
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("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)
    {
        digitalWrite(LED,HIGH);
        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)
{
    digitalWrite(LED,HIGH);
    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
{
    digitalWrite(LED,LOW);
    Serial.println("Publish FAILED");
}
}
}

```

WOKWI

SAVE

SHARE

DocsP

esp32-dht22.ino

diagram.json

libraries.txt

Library Manager

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Simulation

01:41.843100%

ESP32

HC-SR04

Sending payload: {"Distance":399.96}

Publish OK

Sending payload: {"Distance":399.96}

Publish OK

Sending payload: {"Distance":399.96}

Publish OK

Sending payload: {"Distance":399.96}

Publish OK