

#### Assignment -4

Assignment Date	20 October 2022
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Maximum Marks	2 Marks

##### Question-1:

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

##### Solution :

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

WiFiClient wifiClient;

#define ORG "ifi6yr"
#define DEVICE_TYPE "Demo_123"
#define DEVICE_ID "demo123"
#define TOKEN "Aj?fU03ynglZ3QNr0e"
#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["AlertDistance"]=dist;
        serializeJson(doc, payload);
        delay(3000);
        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

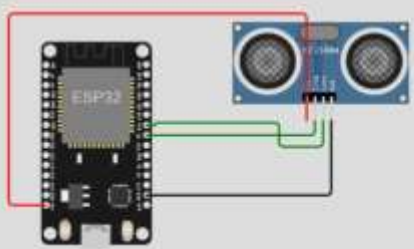
esp32-dht22.ino

```

1 #include <WiFi.h>
2 #include <PubSubClient.h>
3 #include <ArduinoJson.h>
4 WiFiClient wifiClient;
5 #define ORG "if6yr"
6 #define DEVICE_TYPE "Demo_133"
7 #define DEVICE_ID "demo123"
8 #define TOKEN "A17Fu0lyng123QWwde"
9 #define speed 0.034
10 char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
11 char publishTopic[] = "iot-2/evt/Data/fmt/json";
12 char topic[] = "iot-2/cmd/home/fmt/String";
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   mqttConnect();
31 }

```

Simulation



Publish OK

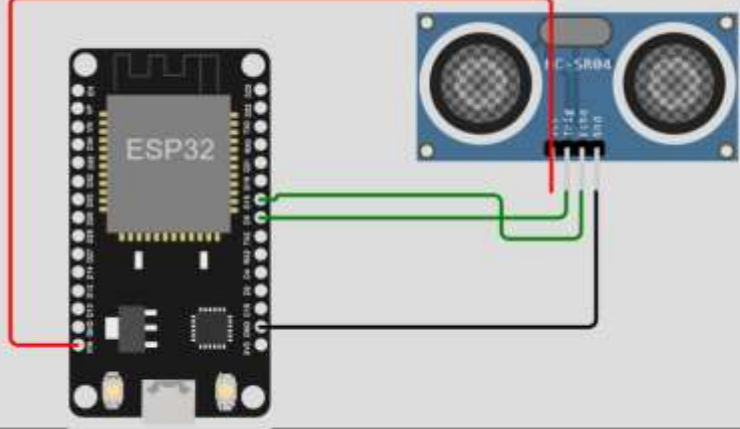
Sending payload: {"AlertDistance":44}

Publish OK

Sending payload: {"AlertDistance":44}

Publish OK

Simulation



Connecting to Wifi..Wifi connected, IP address: 10.10.0.2

Reconnecting MQTT client to if6yr.messaging.internetofthings.ibmcloud.com

1

subscribe to cmd OK

Sending payload: {"AlertDistance":45}

Publish OK

Sending payload: {"AlertDistance":44}

Publish OK

Browse Action Device Types Interfaces

Add Device

Device ID	Status	Device Type	Class ID	Date Added	
demo123	Connected	Demo_123	Device	Nov 2, 2022 1:41 PM	→ ...
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		
Data	{"AlertDistance":36}	json	a few seconds ago		
Data	{"AlertDistance":36}	json	a few seconds ago		
Data	{"AlertDistance":75}	json	a few seconds ago		
Data	{"AlertDistance":44}	json	a few seconds ago		

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0 Simulations running