

Assignment - 4
Ultrasonic Sensor

Assignment Date	01 November 2022
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Student Roll Number	910819104002
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:

Code:

```
#include<WiFi.h>
#include<WiFiClient.h>
#include<PubSubClient.h>
#define PIN_TRIG 5
#define PIN_ECHO 18
#define SOUND_SPEED 0.034
#define ORG "tn54rk"
#define DEVICE_TYPE "ESP32"
#define DEVICE_ID "100100C40A24"
#define TOKEN "7Y6cL4IhrMtTsaTZBD"
char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
char pubTopic1[] = "iot-2/evt/Data1/fmt/json";
char authMethod[] = "use-token-auth";
char token[] = TOKEN;
char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;
```

```
WiFiClient wifiClient;
PubSubClient client(server, 1883, NULL, wifiClient);
void setup() {
  Serial.begin(115200);
  pinMode(PIN_TRIG, OUTPUT);
  pinMode(PIN_ECHO, INPUT);
  Serial.print("Connecting to WiFi");
  WiFi.begin("Wokwi-GUEST","",6);
  while(WiFi.status() != WL_CONNECTED)
  {
    delay(100);
    Serial.print(".");
  }
}
```

```

    Serial.println("Connected to!");
    Serial.print("Local ESP32 IP: ");
    Serial.println(WiFi.localIP());
    if (!client.connected()) {
        Serial.print("Reconnecting client to ");
        Serial.println(server);
        while (!client.connect(clientId, authMethod, token)) {
            Serial.print(".");
            delay(500);
        }
        Serial.println("Bluemix connected");
    }
}
int value=0;
void loop() {
    digitalWrite(PIN_TRIG, HIGH);
    delayMicroseconds(10);
    digitalWrite(PIN_TRIG, LOW);
    int duration = pulseIn(PIN_ECHO, HIGH);
    int distance = duration * SOUND_SPEED/2;
    Serial.print("Distance in CM: ");
    Serial.println(distance);
    delay(1000);
    ++value;
    if(distance<100)
    {
        String payload = "{\"d\":{\"Name\":\"\" DEVICE_ID \"\"";
        payload += "\",\"Distance\":";
        payload += distance;
        payload += "\"}";

        Serial.print("Sending payload: ");
        Serial.println(payload);

        if (client.publish(pubTopic1, (char*) payload.c_str())) {
            Serial.println("Publish ok");
        } else {
            Serial.println("Publish failed");
        }
    }
}
}

```

Output:

WOKWI

SAVE

SHARE

Docs

SIGN UP

sketch.ino

diagram.json

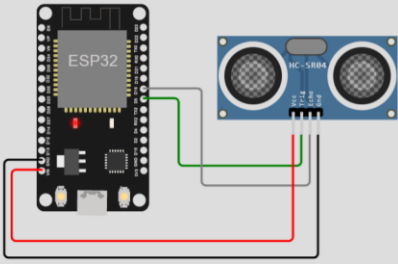
libraries.txt

Library Manager

```
1 #include <WiFi.h>
2 #include <WiFiClient.h>
3 #include <PubSubClient.h>
4 #define PIN_TRIG 5
5 #define PIN_ECHO 18
6 #define SOUND_SPEED 0.034
7 #define ORG "tn54rk"
8 #define DEVICE_TYPE "ESP32"
9 #define DEVICE_ID "100100C40A24"
10 #define TOKEN "7Y6cL4HrMtsTZBD0"
11 char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
12 char pubTopic[] = "iot-2/evt/Data1/fmt/json";
13 char authMethod[] = "use-token-auth";
14 char token[] = TOKEN;
15 char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;
16
17 WiFiClient wifiClient;
18 PubSubClient client(server, 1883, NULL, wifiClient);
19
20 void setup() {
21   Serial.begin(115200);
22   pinMode(PIN_TRIG, OUTPUT);
23   pinMode(PIN_ECHO, INPUT);
24   Serial.print("Connecting to WiFi");
25   WiFi.begin("Wokwi-GUEST", "", 6);
26   while(WiFi.status() != WL_CONNECTED)
27   {
28     delay(100);
29     Serial.print(".");
30   }
31   Serial.println("Connected to!");
32   Serial.print("Local ESP32 IP: ");
33   Serial.println(WiFi.localIP());
34   if (!client.connected()) {
35     Serial.print("Reconnecting client to ");
36     Serial.println(server);
37     while (!client.connect(clientId, authMethod, token)) {
```

Simulation

00:03.016 79%



Connecting to WiFi.....Connected to!

Local ESP32 IP: 10.10.0.2

Reconnecting client to tn54rk.messaging.internetofthings.ibmcloud.com

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IBM Watson IoT Platform

910819104002@smartinternz.com

ID: tn54rk

Browse

Action

Device Types

Interfaces

Add Device

Device ID	Status	Device Type	Class ID	Date Added
100100C40A24	Disconnected	ESP32	Device	29 Oct 2022 23:20

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
Data1	{"Distance":77}	json	a few seconds ago

1 Simulation running

Kwoki link: <https://wokwi.com/projects/347144098012987988>