

Assignment-4

Date	24 October 2022
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Project Name	Smart farmer - Iot Enabled Smart Farming Application.

Question :

Write code and connections in wokwi for ultrasonic sensors. That whenever distance is less than 100 cms send "alert" to ibm cloud and display in device recent events.

Upload document with wokwi share link and images.

Wokwi:

<https://wokwi.com/projects/348389018598113876>

Code:

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

```
WiFiClient wifiClient;
```

```
#define ORG "lbf117"
#define DEVICE_TYPE "abcd"
#define DEVICE_ID "soundammal"
#define TOKEN "12345678"
#define speed 0.034
```

```
char server[] = ORG".messaging.internetofthings.ibmcloud.com";
char publishTopic[] = "iot-2/evt/status1/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; float
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(500);
        }
        initManagedDevice();
        Serial.println();
    } }
    void initManagedDevice() { if
        (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){
            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");
            } else
            {
                Serial.println("Publish FAILED");
            }
        }
    }

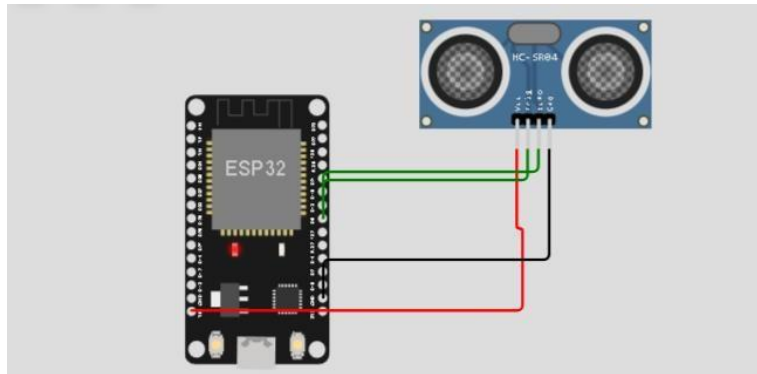
```

```

    }
  }
}

```

Diagram:



Wokwi Output:

Wokwi Output simulation interface showing the sketch code and the simulation results.

Sketch Code (sketch.ino):

```

1  #include <WiFi.h>
2  #include <PubSubClient.h>
3
4  WiFiClient wificlient;
5
6  #define ORG "lbf117"
7  #define DEVICE_TYPE "abcd"
8  #define DEVICE_ID "soundammal"
9  #define TOKEN "12345678"
10 #define speed 0.034
11
12
13 char server[] = ORG".messaging.internetofthings.ibmcloud.com";
14 char publishTopic[] = "iot-2/evt/event_1/fmt/json";
15 char topic[] = "iot-2/cmd/home/fmt/String";
16 char authMethod[] = "use-token-auth";
17 char token[] = TOKEN;
18 char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;
19 PubSubClient client(server, 1883, wificlient);
20 void publishData();
21 const int trigpin=5;
22 const int echopin=18;
23 String command;
24 String data="";
25 long duration;
26 float dist;
27 void setup()
28 {
29   Serial.begin(115200);
30   pinMode(trigpin, OUTPUT);

```

Simulation Output:

04:56.341 89%

Publish OK

Sending payload: {"Alert distance":99.98}

Publish OK

Sending payload: {"Alert distance":99.98}

Publish OK

Service Details - IBM Cloud x IBM Watson IoT Platform x Verify your identity - soundamm x sketch.ino - Wokwi Arduino and x

ibf117.internetofthings.ibmcloud.com/dashboard/devices/browse

soundamm2608@gmail.com ID: lb117

Browse Action Device Types Interfaces Add Device +

The recent events listed show the live stream of data that is coming and going from this device.

Event	Value	Format	Last Received
event_1	{"randomNumber":31}	json	a few seconds ago
event_1	{"randomNumber":13}	json	a few seconds ago
event_1	{"randomNumber":6}	json	a few seconds ago
event_1	{"randomNumber":62}	json	a few seconds ago
event_1	{"randomNumber":25}	json	a few seconds ago

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1 Simulation running

IBM cloud output:

Service Details - IBM Cloud x IBM Watson IoT Platform x Verify your identity - soundamm x sketch.ino - Wokwi Arduino and x

ibf117.internetofthings.ibmcloud.com/dashboard/devices/browse

soundamm2608@gmail.com ID: lb117

Browse Action Device Types Interfaces Add Device +

Browse Devices

All Devices Diagnose

This table shows a summary of all devices that have been added. It can be filtered, organized, and searched on using different criteria. To get started, you can add devices by using the Add Device button, or by using API.

Search by Device ID Device Simulator ☒

<input type="checkbox"/>	Device ID	Status	Device Type	Class ID	Date Added
> <input type="checkbox"/>	soundammal	Connected	abcd	Device	Nov 15, 2022 3:27 PM

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1 Simulation running