

## Assignment 4

### SmartFarmer - IoT Enabled Smart Farming Application

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.

Upload document with wokwi share link and images of ibm cloud

```
#include <WiFi.h>
#include <PubSubClient.h>
WiFiClient wifiClient;
String data3;
#define ORG "4yi0vc"
#define DEVICE_TYPE "Ultero_sonic_1"
#define DEVICE_ID "Ultero_sonic"
#define TOKEN "123456789"
#define speed 0.034
#define led 14
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;
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();
  }
}

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(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){
        String payload = "{\"Normal 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>101 && dist<111){
        String payload = "{\"Alert distance\":\"";
        payload += dist;
        payload += "\"}";

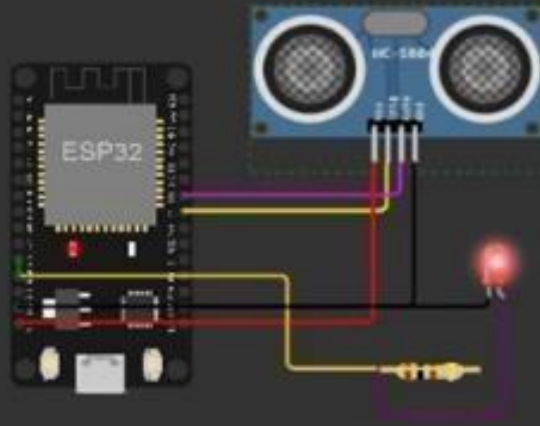
        Serial.print("\n");
        Serial.print("Sending payload: ");
        Serial.println(payload);
        if(client.publish(publishTopic, (char*) payload.c_str())) {
            Serial.println("Warning crosses 110cm -- it automaticaly of the loop");
            digitalWrite(led,HIGH);
        } else {
            Serial.println("Publish FAILED");
        }
    }
}

```

```
}  
void callback(char* subscribeTopic, byte* payload, unsigned int payloadLength){  
  Serial.print("callback invoked for topic:");  
  Serial.println(subscribeTopic);  
  for(int i=0; i<payloadLength; i++){  
    dist += (char)payload[i];  
  }  
  Serial.println("data:" + data3);  
  if(data3=="lighton"){  
    Serial.println(data3);  
    digitalWrite(led,HIGH);  
  }  
  data3="";  
}
```

Editing Ultrasonic Distance Sensor

Distance:  90cm



Sending payload: {"Normal Distance":89.95}

Publish OK

Sending payload: {"Normal Distance":89.95}

Publish OK

Sending payload: {"Normal Distance":89.95}

Publish OK

Sending payload: {"Normal Distance":89.98}

Publish OK

Sending payload: {"Normal Distance":89.95}

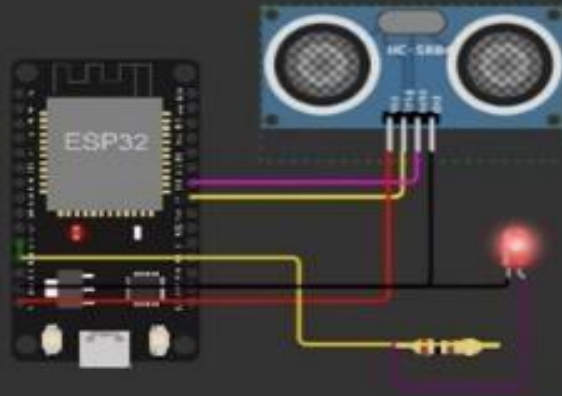
Publish OK

Sending payload: {"Normal Distance":89.95}

Publish OK

### Editing Ultrasonic Distance Sensor

Distance:  107cm



Sending payload: {"Alert distance":106.98}

Warning crosses 110cm -- it automaticaly of the loop

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Warning crosses 110cm -- it automaticaly of the loop

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Sending payload: {"Alert distance":106.98}

Warning crosses 110cm -- it automaticaly of the loop

Sending payload: {"Alert distance":106.98}

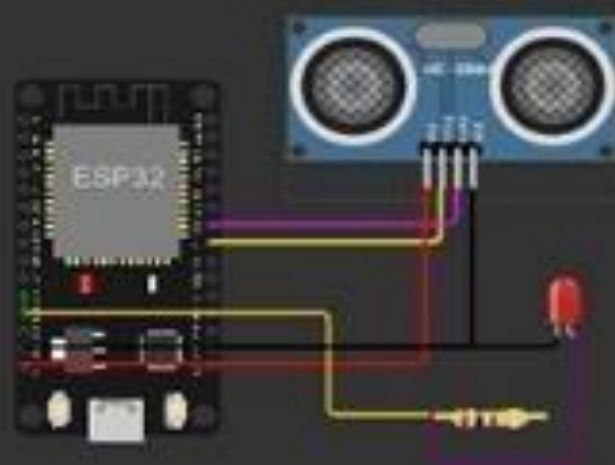
Warning crosses 110cm -- it automaticaly of the loop

Sending payload: {"Alert distance":106.98}

Warning crosses 110cm -- it automaticaly of the loop

## Editing Ultrasonic Distance Sensor

Distance:  125cm



Sending payload: {"Alert distance":106.96}  
Warning crosses 110cm -- it automaticaly of the loop

Sending payload: {"Alert distance":106.98}  
Warning crosses 110cm -- it automaticaly of the loop

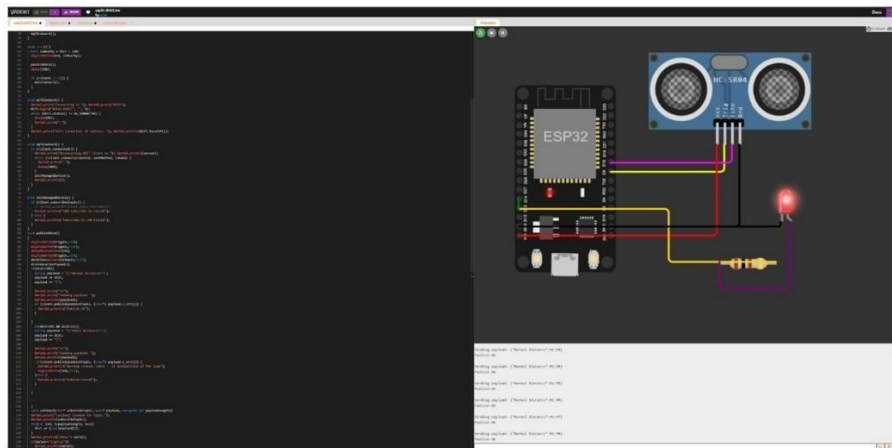
Sending payload: {"Alert distance":106.98}  
Warning crosses 110cm -- it automaticaly of the loop

Sending payload: {"Alert distance":106.98}  
Warning crosses 110cm -- it automaticaly of the loop

Sending payload: {"Alert distance":106.98}  
Warning crosses 110cm -- it automaticaly of the loop

Sending payload: {"Alert distance":106.98}  
Warning crosses 110cm -- it automaticaly of the loop

**OUTPUT:**



▼ ■ Ultero\_sonic\_1 ● Connected Ultero\_sonic Device 31 Oct 2022 20:44 → ...

Identity	Device Information	Recent Events	State	Logs
<b>Device ID</b>	Ultero_sonic_1			
<b>Device Type</b>	Ultero_sonic			
<b>Date Added</b>	31 Oct 2022 20:44			
<b>Added By</b>	krit.it10@gct.ac.in			
<b>Connection Status</b>	<b>Connected</b> Connection Time: 31 Oct 2022 20:44 Client Address: 14.139.188.104 SecureToken			

▼

■

Ultron\_sonic\_1

Disconnected

Ultron\_sonic

Device

31 Oct 2022 20:51

→

...

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
event_1	{"Normal_Distance":69}	json	a few seconds ago
event_1	{"Normal_Distance":43}	json	a few seconds ago
event_1	{"Normal_Distance":81}	json	a few seconds ago
event_1	{"Normal_Distance":79}	json	a few seconds ago
event_1	{"Normal_Distance":20}	json	a few seconds ago