

Assignment -4

Assignment Date	31 Oct 2022
Team ID	PNT2022TMID47161
Team leader	BHARATHI KANNAN R S
Team members	SURYA S , RANJITH KUMAR R ,AHILAN M
Project Name	IOT BASED SMART CROP PROTECTION SYSTEM FOR AGRICULTURE .

Question:

Write a 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

Code:

```
#include <WiFi.h>//library for wifi
#include <PubSubClient.h>//library for MQTT
WiFiClient wifiClient;
String data3;
#define ORG "g05aq3"
#define DEVICE_TYPE "ultrasonic"
#define DEVICE_ID "ultrasonic_assignment_4"
#define TOKEN "qwertyuio"
#define speed 0.034 #define led 14 char server[] = ORG
".messaging.internetofthings.ibmcloud.com"; char publishTopic[]
= "iot-2/evt/ultrasonic/fmt/json"; char topic[] = "iot-
```

```
2/cmd/status/fmt/String"; char authMethod[] = "use-token-  
auth"; char token[] = TOKEN;  
char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;  
PubSubClient client(server, 1883, wifiClient);
```

```
const int trigpin=19; 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 = "{\"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){
    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  
    {  
        Serial.println("Publish FAILED");  
    }  
}  
}
```

Output:

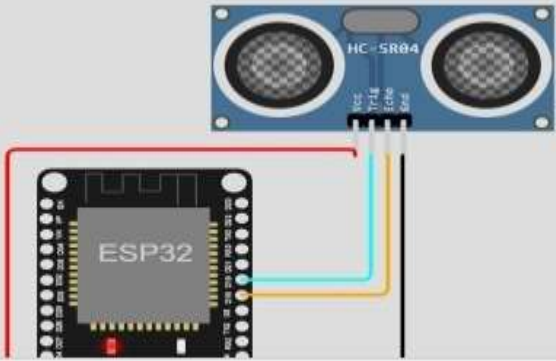
1. When distance greater than 100 cm

WOKWI SAVE SHARE Docs

sketch.ino diagram.json libraries.txt Library Manager

```
1 #include <WiFi.h>//library for wifi
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3 WiFiClient wifiClient;
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16 char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;
17 PubSubClient client(server, 1883, wifiClient);
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19
20
21 const int trigpin=19;
22 const int echopin=18;
23 String command;
24 String data="";
25
26 long duration;
27 float dist;
28
29
30
```

Simulation 00:26.081



Publish OK

Sending payload: {"Distance":160.97}
Publish OK

Sending payload: {"Distance":160.97}
Publish OK

Browse Action Device Types Interfaces

Add Device +

ultrasonic_assignment_4 Connected ultrasonic Device Oct 31, 2022 8:13 PM → ...

Identity Device Information Recent Events State Logs X

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

Event	Value	Format	Last Received
ultrasonic	{"Distance":160.97}	json	a few seconds ago
ultrasonic	{"Distance":160.97}	json	a few seconds ago
ultrasonic	{"Distance":160.96}	json	a few seconds ago
ultrasonic	{"Distance":160.97}	json	a few seconds ago
ultrasonic	{"Distance":153.97}	json	a few seconds ago

1 Simulation running

1 Simulation running

2. When distance less than 100 cm

WOKWI

SAVE

SHARE

Docs

sketch.ino

diagram.json

libraries.txt

Library Manager

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26 long duration;
27 float dist;
```

Simulation

00:26.081

HC-SR04

Vcc Trig Echo Gnd

ESP32

Publish OK

Sending payload: {"Distance":160.97}

Publish OK

Sending payload: {"Distance":160.97}

Publish OK

Add Device

1 Simulation running