

Assignment 4

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Team ID	PNT2022TMID38320
Project Name	Smart Waste Management System For Metropolitan Cities

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

```
#include <WiFi.h> //library for wifi
#include <PubSubClient.h> //library for MQTT
WiFiClient wifiClient;
String data3;
#define ORG "km27sq"
#define DEVICE_TYPE "Ruibashree"
#define DEVICE_ID "Assignment_4"
#define TOKEN "09876543"
#define speed 0.034
#define led 14
char server[] = ORG ".messaging.internetofthings.ibmcloud.com";

char publishTopic[] = "iot-2/evt/rubashree/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

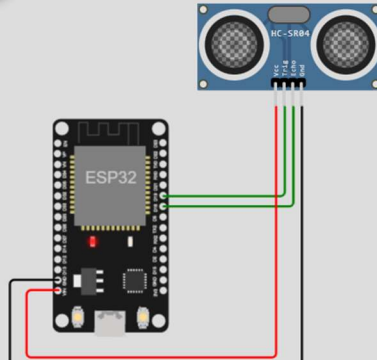
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sketch.ino diagram.json libraries.txt Library Manager

```
1 #include <WiFi.h> //library for wifi
2 #include <PubSubClient.h> //library for MQTT
3 WiFiClient wifiClient;
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11 char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
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13 char publishTopic[] = "iot-2/evt/rubashree/fmt/json";
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17 char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;
18 PubSubClient client(server, 1883, wifiClient);
19
20 const int trigpin=19;
21 const int echopin=18;
22 String command;
23 String data="";
24 long duration;
25 float dist;
26
27 void setup()
28 {
29   Serial.begin(115200);
30   pinMode(led, OUTPUT);
31   pinMode(trigpin, OUTPUT);
32   pinMode(echopin, INPUT);
33   wifiConnect();
34   mqttConnect();
35 }
36 void loop()
37 {
38   --
39 }
```

Simulation

01:08.996 96%



Publish OK

Sending payload: {"Distance":399.96}

Publish OK

Sending payload: {"Distance":399.96}

Publish OK

Activate Windows
Go to Settings to activate Windows.

IBM RECENT EVENTS:

IBM Watson IoT Platform

Search by Device ID

Device ID	Status	Device Type	Class ID	Date Added	Descriptive Location
03062001	Disconnected	NodeMCU	Device	Oct 26, 2022 2:08 PM	
Assignment_4	Connected	Ruibashree	Device	Nov 4, 2022 1:36 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
rubashree	{"Distance":399.92}	json	a few seconds ago
rubashree	{"Distance":399.92}	json	a few seconds ago
rubashree	{"Distance":399.96}	json	a few seconds ago
rubashree	{"Distance":399.94}	json	a few seconds ago
rubashree	{"Distance":399.96}	json	a few seconds ago

Activate Windows
Go to Settings to activate Windows.

2. When distance less than 100 cm

WOKWI

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sketch.ino diagram.json libraries.txt Library Manager

```

1 #include <WiFi.h> //library for wifi
2 #include <PubSubClient.h> //library for MQTT
3 WiFiClient wificlient;
4 String data3;
5 #define ORG "km27sq"
6 #define DEVICE_TYPE "Ruibashree"
7 #define DEVICE_ID "Assignment_4"
8 #define TOKEN "09876543"
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15 char authMethod[] = "use-token-auth";
16 char token[] = TOKEN;
17 char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;
18 PubSubClient client(server, 1883, wificlient);
19
20 const int trigpin=19;
21 const int echopin=18;
22 String command;
23 String data="";
24 long duration;
25 float dist;
26
27 void setup()
28 {
29   Serial.begin(115200);
30   pinMode(led, OUTPUT);
31   pinMode(trigpin, OUTPUT);
32   pinMode(echopin, INPUT);
33   wifiConnect();
34   mqttConnect();
35 }
36 void loop()
37 {

```

Simulation

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ESP32

HC-SR04

Publish OK

Sending payload: {"Alert Distance":96.93}

Publish OK

Sending payload: {"Alert Distance":96.93}

Publish OK

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IBM RECENT EVENTS:

IBM Watson IoT Platform

412619106014@smartinternz.com
ID: km27sq

Browse

Action

Device Types

Interfaces

Search by Device ID

Device Simulator

Add Device

Device ID	Status	Device Type	Class ID	Date Added	Descriptive Location
03062001	Disconnected	NodeMCU	Device	Oct 26, 2022 2:08 PM	
Assignment_4	Connected	Ruibashree	Device	Nov 4, 2022 1:36 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
rubashree	{"Alert Distance":96.93}	json	a few seconds ago
rubashree	{"Alert Distance":96.93}	json	a few seconds ago
rubashree	{"Alert Distance":96.93}	json	a few seconds ago
rubashree	{"Alert Distance":96.97}	json	a few seconds ago
rubashree	{"Alert Distance":96.93}	json	a few seconds ago

Activate Windows
Go to Settings to activate Windows.