

Assignment 4

Wokwi Assignment

Assignment Question:

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.

Wokowi Link: <https://wokwi.com/projects/347327129936986708>

```
#include <WiFi.h> //library for wifi
```

```
#include <PubSubClient.h> //library for MQTT
```

```
#define ECHO_GPIO 12
```

```
#define TRIGGER_GPIO 13
```

```
#define MAX_DISTANCE_CM 100 // Maximum of 5 meters
```

```
#include "Ultrasonic.h"
```

```
Ultrasonic ultrasonic(13, 12);
```

```
int distance;
```

```
void callback(char* subscribetopic, byte* payload, unsigned int payloadLength);
```

```
//-----credentials of IBM Accounts-----
```

```
#define ORG "kizp10" //IBM ORGANITION ID
```

```
#define DEVICE_TYPE "IoTdevice" //Device type mentioned in ibm watson IOT Platform
```

```
#define DEVICE_ID "1234567890" //Device ID mentioned in ibm watson IOT Platform
```

```
#define TOKEN "1234567890" //Token
```

```
String data3;
```

```
float h, t;
```

```
//----- Customise the above values -----
char server[] = ORG ".messaging.internetofthings.ibmcloud.com";// Server Name
char publishTopic[] = "iot-2/evt/Data/fmt/json";// topic name and type of event
perform and format in which data to be send
char subscribetopic[] = "iot-2/cmd/command/fmt/String";// cmd REPRESENT command
type AND COMMAND IS TEST OF FORMAT STRING
char authMethod[] = "use-token-auth";// authentication method
char token[] = TOKEN;
char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;//client id
```

```
//-- ----- --
WiFiClient wifiClient; // creating the instance for wificlient
PubSubClient client(server, 1883, callback, wifiClient); //calling the predefined client id
by passing parameter like server id,portand wificredential
```

```
void setup()// configureing the ESP32
{
  Serial.begin(115200);
  delay(10);
  Serial.println();
  wificonnect();
  mqttconnect();
}
```

```
void loop()// Recursive Function
{
```

```
  distance = ultrasonic.read(CM);
  if (distance < 100) {
    Serial.print("Distance in CM: ");
    Serial.println(distance);
    PublishData(distance);
    delay(1000);
    if (!client.loop()) {
      mqttconnect();
    }
  }
```

```
}
```

```
  delay(1000);
```

```

}

/* .....retrieving to Cloud ..... */

void PublishData(float temp) {
  mqttconnect();//function call for connecting to ibm
  /*
    creating the String in in form JSon to update the data to ibm cloud
  */
  String payload = "{\"Alert Distance\":\"";
  payload += temp;
  payload += "\"}";

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

  if (client.publish(publishTopic, (char*) payload.c_str())) {
    Serial.println("Publish ok");// if it sucessfully upload data on the cloud then it will
    print publish ok in Serial monitor or else it will print publish failed
  } else {
    Serial.println("Publish failed");
  }
}

void mqttconnect() {
  if (!client.connected()) {
    Serial.print("Reconnecting client to ");
    Serial.println(server);
    while (!!!client.connect(clientId, authMethod, token)) {
      Serial.print(".");
      delay(500);
    }

    initManagedDevice();
    Serial.println();
  }
}

```

```

}
void wificonnect() //function defination for wificonnect
{
    Serial.println();
    Serial.print("Connecting to ");

    WiFi.begin("Wokwi-GUEST", "", 6); //passing the wifi credentials to establish the
connection
    while (WiFi.status() != WL_CONNECTED) {
        delay(500);
        Serial.print(".");
    }
    Serial.println("");
    Serial.println("WiFi connected");
    Serial.println("IP address: ");
    Serial.println(WiFi.localIP());
}

void initManagedDevice() {
    if (client.subscribe(subscribetopic)) {
        Serial.println((subscribetopic));
        Serial.println("subscribe to cmd OK");
    } else {
        Serial.println("subscribe to cmd 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++) {
        //Serial.print((char)payload[i]);
        data3 += (char)payload[i];
    }
    Serial.println("data: " + data3);
    if (data3 == "lighton")
    {
        Serial.println(data3);
    }
}

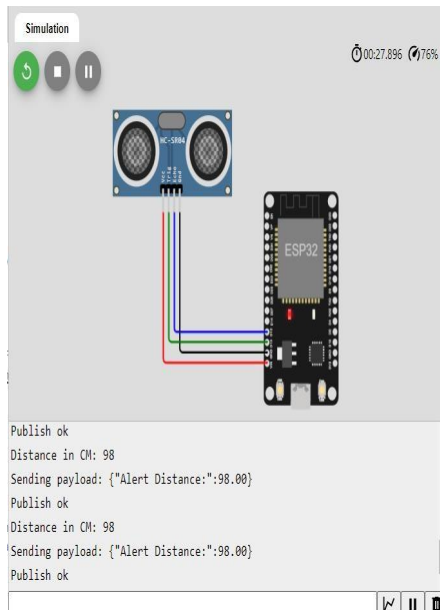
```

```

else
{
  Serial.println(data3);
}
data3 = "";
}

```

When the distance is less than 100cm the alert is not sent to the IBM cloud



Browse

Action

Device Types

Interfaces

Add Device

1234567890

Connected

IOTdevice

Device

Nov 3, 2022 10:45 PM

...

Identity

Device Information

Recent Events

State

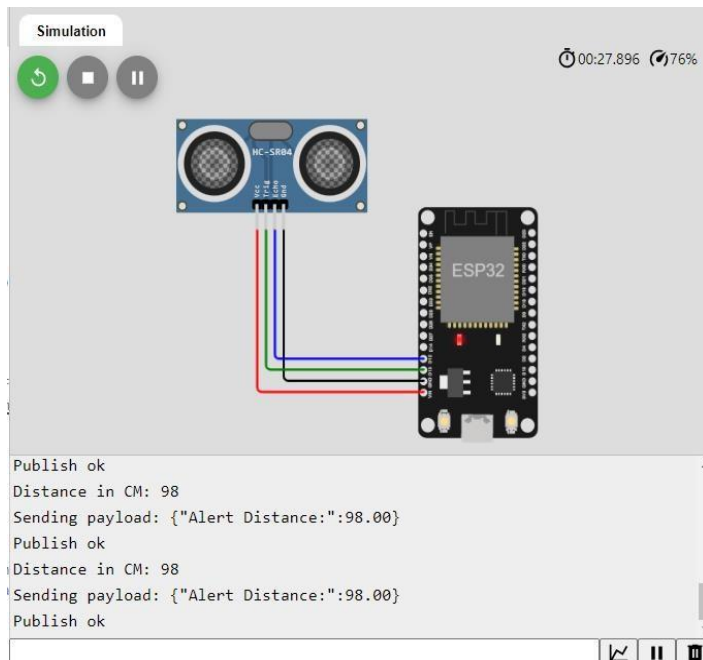
Logs

X

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

Event	Value	Format	Last Received
Data	{"Alert Distance":98}	json	a few seconds ago
Data	{"Alert Distance":98}	json	a few seconds ago
Data	{"Alert Distance":98}	json	a few seconds ago
Data	{"Alert Distance":98}	json	a few seconds ago
Data	{"Alert Distance":98}	json	a few seconds ago

When the distance is more than 100cm the alert is not sent to the IBM cloud



BrowseActionDevice TypesInterfaces

Add Device

<input type="checkbox"/>	Device ID	Status	Device Type	Class ID	Date Added	
<input checked="" type="checkbox"/>	1234567890	Connected	IOTdevice	Device	Nov 3, 2022 10:45 PM	→ ...

IdentityDevice InformationRecent EventsStateLogs

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

Event	Value	Format	Last Received
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