

Team ID	PNT2022TMID05219
Project Name	Smart Waste Management System For Metropolitan Cities

Write code and connections in wokwi for ultrasonic sensor. Whenever the distance is less than 100 cm, send "alert" to IBM cloud and display in device recent events.

WOKWI LINK: <https://wokwi.com/projects/347136221699375700>

CODE:

```
#include <WiFi.h>
#include <PubSubClient.h>
WiFiClient wifiClient;
String data3;
#define ORG "x0fxss"
#define DEVICE_TYPE "Noder"
#define DEVICE_ID "1234"
#define TOKEN "987654321"
#define speed 0.034
#define led 14
char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
char publishTopic[] = "iot-2/evt/Kaviya_assignment4/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);
```

```
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 = "{\\"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:

Wokwi - Online Arduino IDE

Wokwi.com/projects/347136221699375700

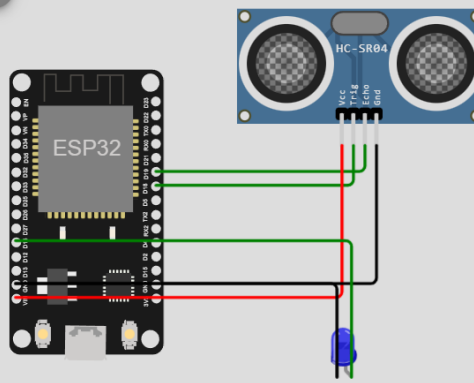
WOKWI SAVE SHARE

Docs

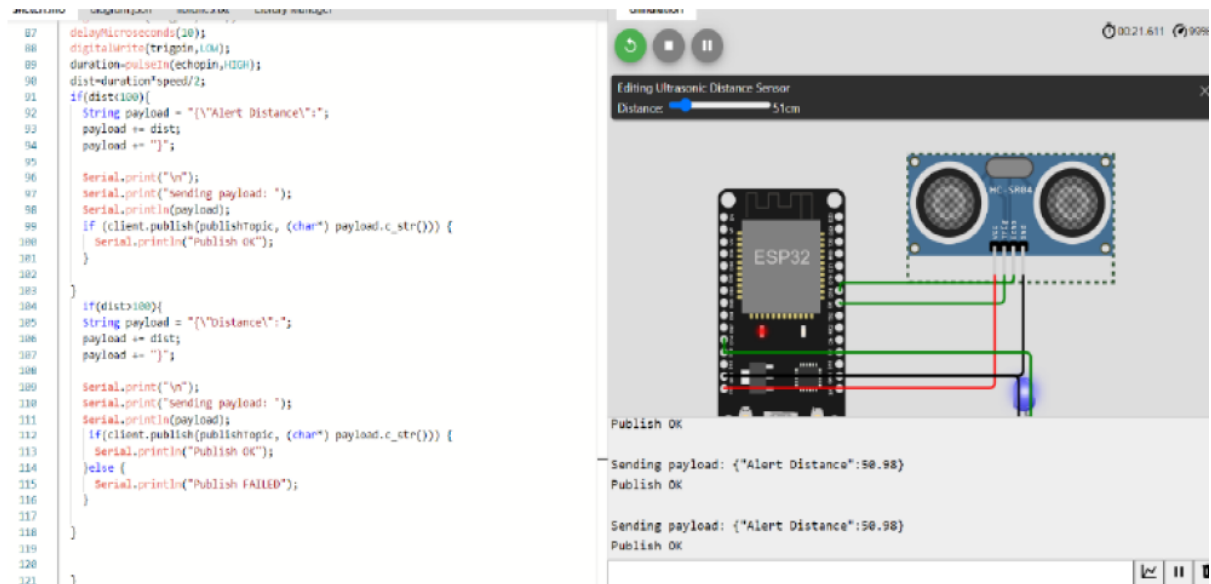
sketch.ino diagram.json Library Manager

```
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3 WiFiClient wifiClient;
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5 #define ORG "x0fxss"
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11 char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
12 char publishTopic[] = "iot-2/evt/Kaviya_assignment4/fmt/json";
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14 char authMethod[] = "use-token-auth";
15 char token[] = TOKEN;
16 char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;
17 PubSubClient client(server, 1883, wifiClient);
18 const int trigpin=5;
19 const int echopin=18;
20 String command;
21 String data="";
22 long duration;
23 float dist;
24 void setup()
25 {
26   Serial.begin(115200);
27   pinMode(led, OUTPUT);
```

Simulation



A) When distance greater than 100 ,



B) When distance less than 100 ,

The screenshot displays the Arduino IDE interface during a simulation. The left pane shows the code for an ESP32-based IoT device. The code includes headers for WiFi and PubSubClient, defines various constants like ORG, DEVICE_TYPE, DEVICE_ID, TOKEN, speed, and led, and sets up the server, topic, and authentication. It also defines pins for trigpin and echopin. The right pane shows a simulation of the hardware, including an ESP32 module and an HC-SR04 ultrasonic sensor. The simulation status bar at the bottom indicates successful publishing of distance data.

```
#include <WiFi.h>
#include <PubSubClient.h>
WiFiClient wifiClient;
String data3;
#define ORG "x0fxss"
#define DEVICE_TYPE "Noden"
#define DEVICE_ID "1234"
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#define speed 0.034
#define led 14
char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
char publishTopic[] = "iot-2/evt/Kaviya_assignment4/fmt/json";
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char token[] = TOKEN;
char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;
PubSubClient client(server, 1883, wifiClient);

const int trigpin=5;
const int echopin=18;
String command;
String data="";

long duration;
float dist;

... ..
```

Simulation

Publish OK

Sending payload: {"Distance":399.92}
Publish OK

Sending payload: {"Distance":399.96}
Publish OK