

# Assignment 4

## WOKWI PROGRAM

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### PROGRAM

Smart Waste Management System for Metropolitan Cities  
ASSIGNMENT 4:

Write code and connections in wokwi for ultrasonic sensors.

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

#### CODE:

```
#include <WiFi.h>
#include <PubSubClient.h>
WiFiClient wifiClient;
String data3;
#define ORG "4yi0vc"
#define DEVICE_TYPE "nodeMcu"
#define DEVICE_ID "Assignment4"
#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");
    }
  }
}

}

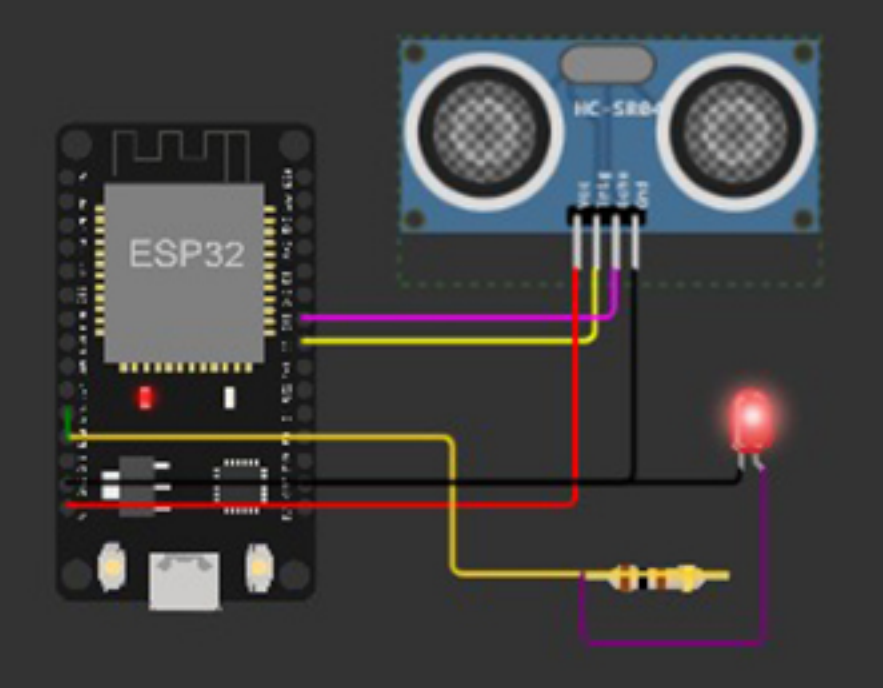
void callback(char* subscribeTopic, byte* payload, unsigned int payloadLength){
  Serial.print("callback invoked for topic:");
  Serial.println(subscribeTopic);
  for(int i=0; i<payloadLength; i++){
    dist += (char)payload[i];
  }
  Serial.println("data:" + data3);
  if(data3=="lighton"){
    Serial.println(data3);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

```



# Output

Editing Ultrasonic Distance Sensor  
Distance:  90cm



```
Sending payload: {"Normal Distance":89.95}
Publish OK

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Publish OK

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Publish OK

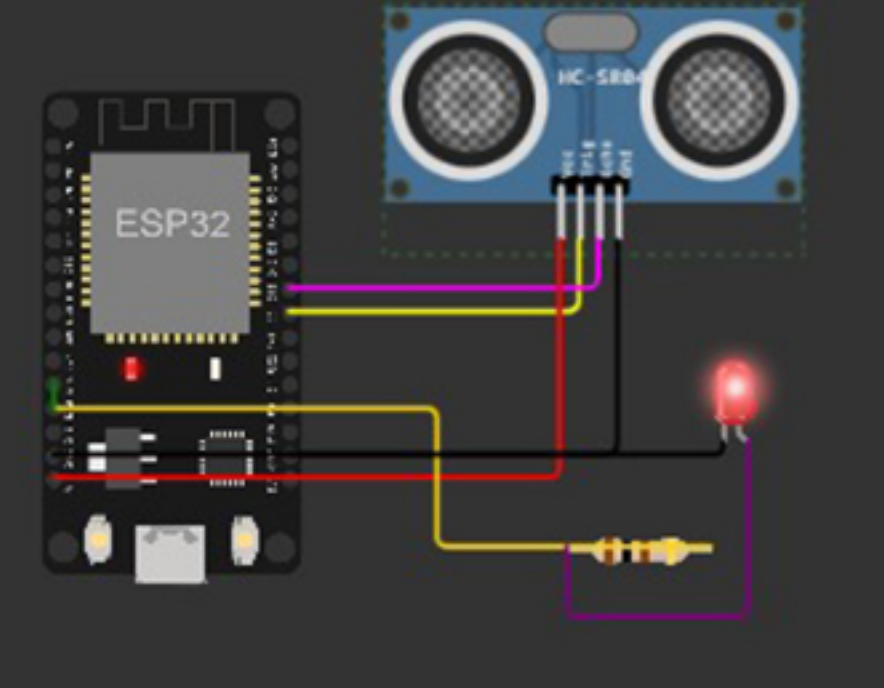
Sending payload: {"Normal Distance":89.98}
Publish OK

Sending payload: {"Normal Distance":89.95}
Publish OK

Sending payload: {"Normal Distance":89.95}
Publish OK
```

**1) when distance under 100 cm  
it wil show normal distance**

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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Warning crosses 110cm -- it automaticaly of the loop

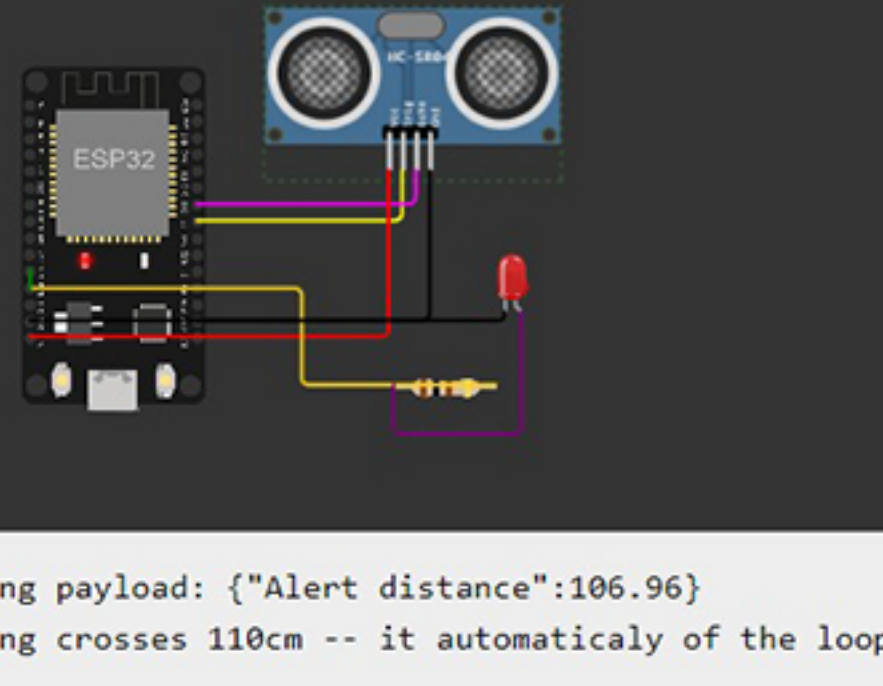
Sending payload: {"Alert distance":106.98}
Warning crosses 110cm -- it automaticaly of the loop

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Warning crosses 110cm -- it automaticaly of the loop

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

**2) when distance cross 100 cm  
it wil show ALERT with warning message  
distance**

Editing Ultrasonic Distance Sensor  
Distance:  125cm



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

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Warning crosses 110cm -- it automaticaly of the loop

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Warning crosses 110cm -- it automaticaly of the loop
```

**when it cross above 110 cm it totally  
move to iff state once it reduce to 110 it on again**

## IBM CLOUD OUPUT

### Recent Events

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

Event	Value	Format	Last Received
Data	{"Normal Distance":89.95}	json	a few seconds ago
Data	{"Normal Distance":89.95}	json	a few seconds ago
Data	{"Normal Distance":89.95}	json	a few seconds ago
Data	{"Normal Distance":89.95}	json	a few seconds ago
Data	{"Normal Distance":89.95}	json	a few seconds ago

### Recent Events

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":106.98}	json	a few seconds ago
Data	{"Alert distance":107.03}	json	a few seconds ago
Data	{"Alert distance":106.98}	json	a few seconds ago
Data	{"Alert distance":106.98}	json	a few seconds ago
Data	{"Alert distance":106.98}	json	a few seconds ago



Basic connection information about this device.

Device ID	Assignment4
Device Type	nodeMcu
Date Added	23 Oct 2022 07:20
Added By	920219104302@smartinternz.com
Connection Status	Disconnected
	Last Connected: 23 Oct 2022 16:57
	Client Address: 145.40.94.93 Insecure
	Duration: 3 minutes
	Data Transferred: 14.4 KB

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

Event	Value	Format	Last Received
Data	{"Normal Distance":92.99}	json	a few seconds ago
Data	{"Normal Distance":92.99}	json	a few seconds ago
Data	{"Normal Distance":92.99}	json	a few seconds ago
Data	{"Normal Distance":92.99}	json	a few seconds ago
Data	{"Normal Distance":92.99}	json	a few seconds ago

## WORK FLOW LIKE IN description