**Assignment -4**

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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. 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);
```

```cpp
  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 {
```

```cpp
      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:");
```
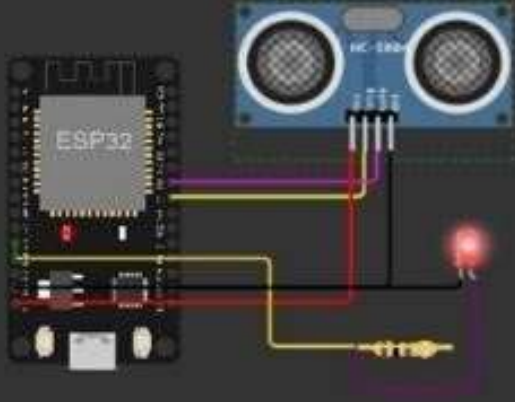
```
Serial.println(subscribeTopic);
for(int i=0; i<payloadLength; i++){
dist += (char)payload[i];
}
Serial.println("data:"+ data3);
if(data3=="lighton"){
Serial.println(data3);
digitalWrite(led,HIGH);
}
data3="";
}
```

**NODE-RED**



Editing Ultrasonic Distance Sensor
Distance: 90cm

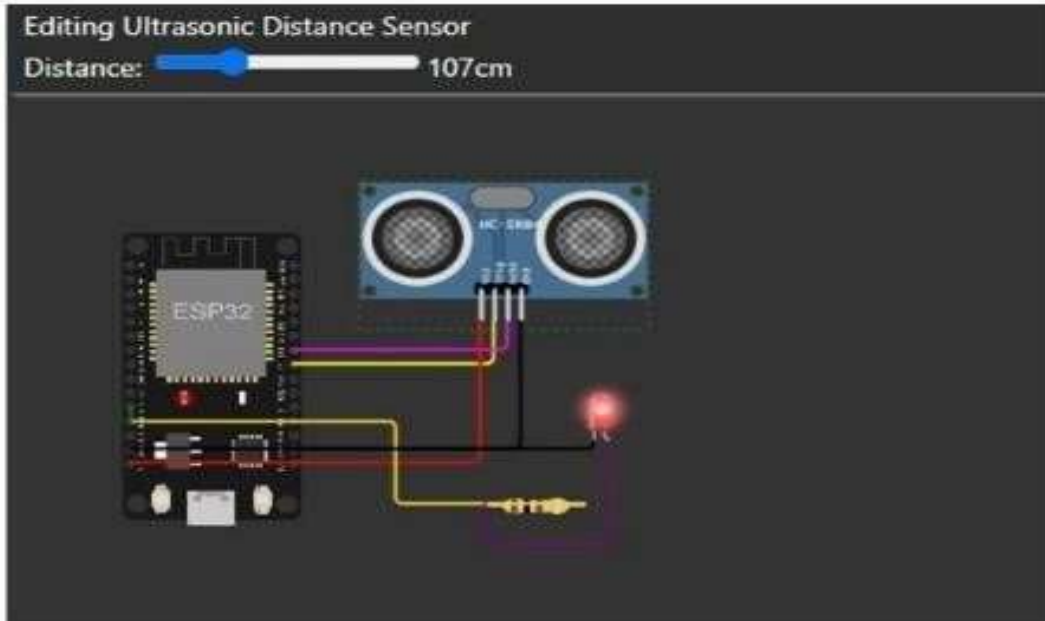Sending payload: {"Normal Distance":89.95}
Publish OK

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

Sending payload: {"Normal Distance":89.95}
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

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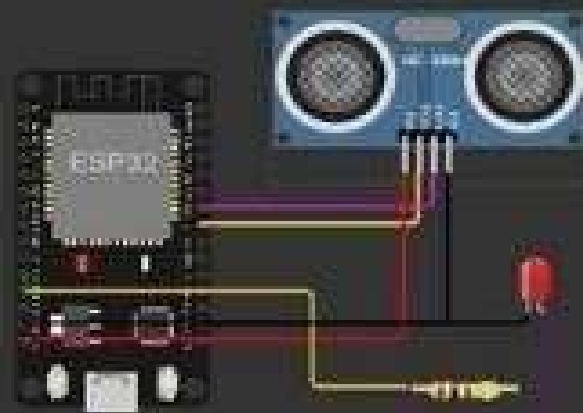
Sending payload: {"Alert distance":106.98}
Warning crosses 110cm -- it automaticaly of the loop

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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

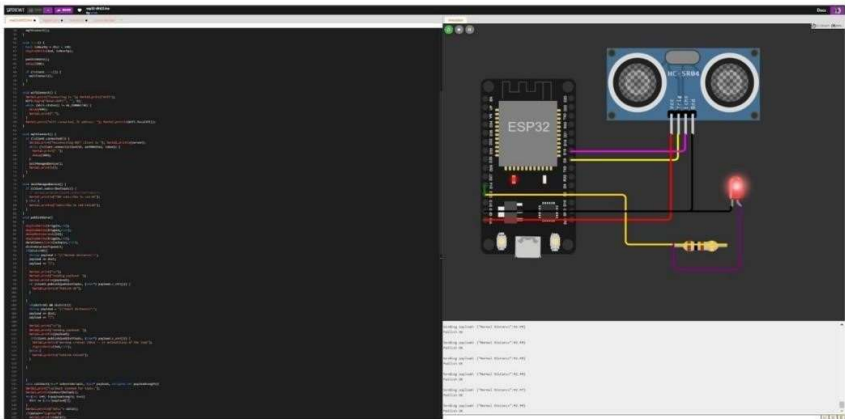Sending payload: {"Alert distance":106.98}
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**OUTPUT**



## Connection Information

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**<br>Last Connected: 23 Oct 2022 16:57<br>Client Address: 145.40.94.93 Insecure<br>Duration: 3 minutes<br>Data Transferred: 14.4 KB |

## 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":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 |