

ASSIGNMENT 4

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 "ktymlx"
#define DEVICE_TYPE "new"
#define DEVICE_ID "09876"
#define TOKEN "Kamesh@2002"
#define speed 0.034
#define led 14
char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
char publishTopic[] = "iot-2/evt/event/fmt/json";
char topic[] = "iot-2/cmd/led/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");
}
}

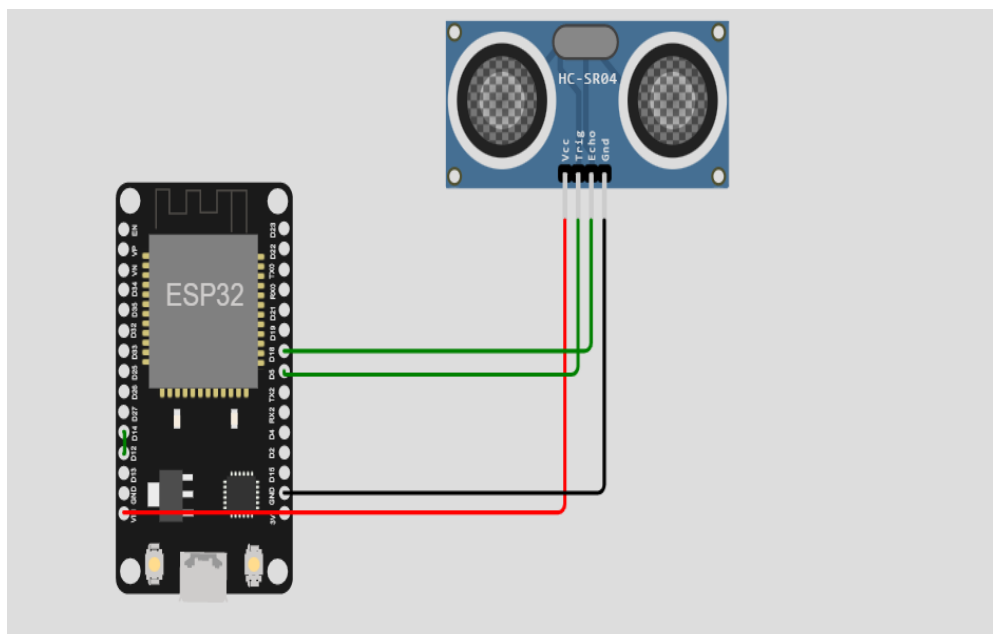
if(dist>100){
String payload = "{\"distance\":\"";
payload += dist;
payload += "\"}";

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");
}
}

}

```

CONNECTIONS:



OUTPUT:

WOKWI

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SAVE SHARE

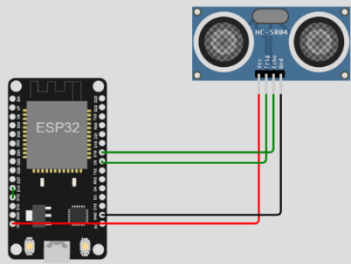
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Docs

sketch.ino diagram.json libraries.txt Library Manager

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31 void setup()
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36   pinMode(echopin, INPUT);
37   wifiConnect();
38   mqttConnect();
39 }
```

Simulation



Sending payload: {"Alert Distance":92.99}
Publish OK

Sending payload: {"Alert Distance":92.94}
Publish OK

Sending payload: {"Alert Distance":92.96}

Type here to search

28°C Partly cloudy 7:40 PM 11/4/2022

The screenshot shows the IBM Watson IoT Platform interface. The top navigation bar includes 'Browse', 'Action', 'Device Types', and 'Interfaces'. A search bar is present with the text 'Search by Device ID'. The main content area displays a table of devices. The selected device has ID 09876, status 'Connected', and device type 'new'. Below the device list, the 'Recent Events' tab is active, showing a stream of events. The events table has columns for Event, Value, Format, and Last Received. The events are all of type 'event' with a value of '{"Alert distance":92.99}' and a format of 'json', received 'a few seconds ago'. A status message at the bottom right indicates '1 Simulation running'.

Event	Value	Format	Last Received
event	{"Alert distance":92.99}	json	a few seconds ago
event	{"Alert distance":92.99}	json	a few seconds ago
event	{"Alert distance":92.99}	json	a few seconds ago
event	{"Alert distance":92.99}	json	a few seconds ago
event	{"Alert distance":92.99}	json	a few seconds ago

WOKWI LINK:

<https://wokwi.com/projects/347396299786551891>