

Assignment 4

Question:

Write a 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.

Solution:

The screenshot displays the Wokwi simulation environment. On the left, the 'sketch.ino' file contains the following code:

```
70
71
72
73 /*.....Retrieving to Cloud.....*/
74
75 void PublishData(float dist) {
76   mqttconnect();//function call for connecting to ibm
77   /*
78    * creating the String in in form json to update the data to ibm cloud
79    */
80   String payload = "{\"distance\":";
81   payload += dist;
82
83
84
85   Serial.print("Sending payload: ");
86   Serial.println(payload);
87
88
89   if (client.publish(publishTopic, (char*) payload.c_str())) {
90     Serial.println("Publish ok");// if it successfully upload data on the cloud then it will
91   } else {
92     Serial.println("Publish failed");
93   }
94
95 }
96
97 void mqttconnect() {
98   if (!client.connected()) {
99     Serial.print("Reconnecting client to ");
100    Serial.println(server);
101    while (!client.connect(clientId, authMethod, token)) {
102      Serial.print(".");
103      delay(500);
104    }
105    initManagedDevice();
106  }
```

On the right, the simulation shows an ESP32 microcontroller connected to an HC-SR04 ultrasonic sensor and an LED. The sensor's VCC is connected to the ESP32's 5V pin, GND to GND, Trig to D4, and Echo to D5. The LED's anode is connected to D2 and its cathode to GND. The serial monitor at the bottom shows the following output:

```
Publish ok
distance in cm150.27
Sending payload: {"distance":150.27
Publish ok
distance in cm150.30
Sending payload: {"distance":150.30
Publish ok
```

Browse

Action

Device Types

Interfaces

Add Device

Search by Device ID

Device Simulator

Device ID	Status	Device Type	Class ID	Date Added
sound	Disconnected	ultrasonic	Device	Nov 4, 2022 5:40 AM

Identity

Device Information

Recent Events

State

Logs

Device ID

Device Type

Date Added

Added By

Connection Status

sound

ultrasonic

Nov 4, 2022 5:40 AM

511919106002@smartinternz.com

Disconnected

1 Simulation running

Browse

Action

Device Types

Interfaces

Add Device

Device ID

Status

Device Type

Class ID

Date Added

sound

Disconnected

ultrasonic

Device

Nov 4, 2022 5:40 AM

Identity

Device Information

Recent Events

State

Logs

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

Event	Value	Format	Last Received
event_1	{"distance":76}	json	a few seconds ago
event_1	{"distance":85}	json	a few seconds ago
event_1	{"distance":82}	json	a few seconds ago
event_1	{"distance":64}	json	a few seconds ago
event_1	{"distance":14}	json	a few seconds ago

1 Simulation running

