

ASSIGNMENT - 4

Question:

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

Link: <https://wokwi.com/projects/346784574540350036>

Circuit Diagram:

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

```
1 #include <Wifi.h> //library for wifi
2 #include <PubSubClient.h> //library for MQTT
3 #define TrigPIN 15
4 #define EchoPIN 4
5 #define MINDIST 100
6
7
8
9 void callback(char* subscribetopic, byte* payload, unsigned int payloadLength)
10
11 //-----credentials of IBM Accounts-----
12
13 #define ORG "nwmSpd" //IBM ORGANITION ID
14 #define DEVICE_TYPE "assign" //Device type mentioned in ibm watson IOT Platform
15 #define DEVICE_ID "kauri" //Device ID mentioned in ibm watson IOT Platform
16 #define TOKEN "123456789" //Token
17 String data3;
18 float h, t;
19
20
21 //----- Customise the above values -----
22 char server[] = ORG ".messaging.internetofthings.ibmcloud.com"; // Server Name
23 char publishTopic[] = "iot-2/evt/Data/fmt/json"; // topic name and type of event
24 char subscribetopic[] = "iot-2/cmd/command/fmt/String"; // cmd REPRESENT command
25 char authMethod[] = "use-token-auth"; // authentication method
26 char token[] = TOKEN;
27 char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID; //client id
28
```

On the right, the 'Simulation' window shows a circuit diagram of an ESP32 microcontroller connected to an HC-SR04 ultrasonic sensor. The sensor's VCC pin is connected to the ESP32's 5V pin, GND to GND, Trig to pin 15, and Echo to pin 4. The console output shows the following sequence of events:

```
iot-2/cmd/command/fmt/String
subscribe to cmd OK
Sending payload: {"MESSAGE":"ALERT"}
Publish ok
Sending payload: {"MESSAGE":"ALERT"}
Publish ok
```

OUTPUT:

Connection Information

Recent Events

State

Device Information

Metadata

Diagnostics

Connection Logs

Device Actions

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	{"MESSAGE": "ALERT"}	json	a few seconds ago
Data	{"MESSAGE": "ALERT"}	json	a few seconds ago
Data	{"MESSAGE": "ALERT"}	json	a few seconds ago
Data	{"MESSAGE": "ALERT"}	json	a few seconds ago
Data	{"MESSAGE": "ALERT"}	json	a few seconds ago