

Assignment 4

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Question:

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

Solution:

Wokwi Project: <https://wokwi.com/projects/346642979024274002>

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 #include "HCSR04.h" // Library for HCSR04 ultrasonic sensor
4 #define LED 4
5 #define TRIG 2
6 #define ECHO 5
7 void callback(char* subscribetopic, byte* payload, unsigned int payloadLength);
8
9 //-----credentials of IBM Accounts-----
10
11 #define ORG "cbej0m" //IBM ORGANITION ID
12 #define DEVICE_TYPE "ultrasonic" //Device type mentioned in ibm watson IOT Platform
13 #define DEVICE_ID "distance29" //Device ID mentioned in ibm watson IOT Platform
14 #define TOKEN "mT_0SG1&c&DQklig?j" //Token
15 String data3;
16 float d;
17
18 //----- Customise the above values -----
19 char server[] = ORG ".messaging.internetofthings.ibmcloud.com"; // Server Name
20 char publishTopic[] = "iot-2/evt/Data/fmt/json"; // topic name and type of event perform ar
21 char subscribetopic[] = "iot-2/cmd/test/fmt/String"; // cmd REPRESENT command type AND COM
22 char authMethod[] = "use-token-auth"; // authentication method
23 char token[] = TOKEN;
24 char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID; //client id
25
26
27 //-----
28 WiFiClient wificlient; // creating the instance for wificlient
29 PubSubClient client(server, 1883, callback, wificlient); //calling the predefined client
30
31 int trig=2;
32 int echo=5;
```

On the right, the 'Simulation' window shows a visual representation of the ESP32 board and the HC-SR04 sensor. The sensor is connected to the ESP32 via a breadboard. The simulation status bar indicates a runtime of 00:06.894 and 99% completion. Below the simulation, the console output shows the following sequence of events:

```
Publish ok
distance in cm403.49
Sending payload: {"distance":403.49
Publish ok
distance in cm403.49
Sending payload: {"distance":403.49
Publish ok
```

