

Assignment 4

Assignment Date	26 OCTOBER 2022
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Question:

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

WOKWI Link: <https://wokwi.com/projects/346653902282687060>

Wokwi Output:

The screenshot displays the Wokwi simulation interface. On the left, the code editor shows the following code:

```
1 #include <WiFi.h>
2 #include <WiFiClient.h>
3 #include <PubSubClient.h>
4 const int trigPin = 5;
5 const int echoPin = 18;
6 //define sound speed in cm/us
7 #define SOUND_SPEED 0.034
8 #define CM_TO_INCH 0.393701
9 long duration;
10 float distanceCm;
11 float distanceInch;
12
13
14 void callback(char* subscribetopic, byte* payload, unsigned int payloadLength);
15 //-----credentials of IBM Accounts-----
16
17 #define ORG "nfdp5u"//IBM ORGANITION ID
18 #define DEVICE_TYPE "Assignment4"//Device type mentioned in ibm watson IOT Platform
19 #define DEVICE_ID "Alert_system"//Device ID mentioned in ibm watson IOT Platform
20 #define TOKEN "@W?f6B3Nd7vSWjP?U" //Token
21 String data3;
22
23
24
25 //----- Customise the above values -----
26 char server[] = ORG ".messaging.internetofthings.ibmcloud.com";// Server Name
27 char publishTopic[] = "iot-2/evt/Data/fmt/json";// topic name and type of event perform
28 char subscribetopic[] = "iot-2/cmd/test/fmt/String";// cmd REPRESENT command type AND
29 char authMethod[] = "use-token-auth";// authentication method
30 char token[] = TOKEN;
31 char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;//client id
32
33 WiFiClient wificlient; // creating the instance for wificlient
34 PubSubClient client(server, 1883, callback ,wificlient);
35
```

On the right, the simulation window shows 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, and the trig and echo pins to digital pins 5 and 18 respectively. The console output shows the following sequence of events:

```
Sending payload: {"Distance (cm)":216.94}
Publish ok
Distance (cm): 216.94
Distance (inch): 85.41
Sending payload: {"Distance (cm)":216.94}
Publish ok
Distance (cm): 216.94
```

Image of IBM cloud:

The screenshot shows the IBM Watson IoT Platform interface. The top navigation bar includes 'Browse', 'Action', 'Device Types', and 'Interfaces'. The main content area displays the 'Alert_system' device, which is 'Disconnected'. The 'Recent Events' tab is selected, showing a table of events:

Event	Value	Format	Last Received
Data	{"Distance(cm)":90}	json	a few seconds ago
Data	{"Distance(cm)":70}	json	a few seconds ago
Data	{"Distance(cm)":75}	json	a few seconds ago
Data	{"Distance(cm)":59}	json	a few seconds ago
Data	{"Distance(cm)":72}	json	a few seconds ago