

## Assignment 4

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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 an Arduino sketch for an ESP32. The code includes libraries for WiFi, WiFiClient, and PubSubClient. It defines pins for an ultrasonic sensor (trigPin = 5, echoPin = 18) and sets constants for sound speed and distance units. The main logic involves sending distance measurements to an IBM Watson IoT Platform topic 'Alert\_system' using a token-based authentication method. The output window on the right shows the simulation results, including the distance measured in centimeters and inches, and the JSON payload sent to the cloud.

```
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* subscribtopic, 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 "@Vw?f6B3Nd7wSw3p?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 subscribtopic[] = "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
```

Simulation

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 web interface. The top navigation bar includes 'Browse', 'Action', 'Device Types', and 'Interfaces'. The main content area displays details for a device named 'Alert\_system', which is currently 'Disconnected'. The 'Recent Events' tab is selected, showing a list of events with columns for 'Event', 'Value', 'Format', and 'Last Received'. The events show distance measurements in centimeters being sent to the cloud.

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