

## Assignment -4

### ESP32 Program

Assignment Date	29 OCTOBER 2022
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Maximum Marks	2 Marks

#### Question-1:

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/346841237203976788>

The screenshot shows the Wokwi web interface. On the left, the code for 'esp32-blink.ino' is displayed, which includes libraries for WiFi and PubSubClient, defines pins and constants, and sets up a callback to send distance data to IBM Cloud. On the right, the simulation shows an ESP32 board connected to an HC-SR04 ultrasonic sensor. The output console shows the sensor's readings and the successful transmission of a JSON payload to IBM 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 CH_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 "19k739"//IBM ORGANITION ID
18 #define DEVICE_TYPE "ultrasonic_project"//Device type mentioned in ibm watson
19 #define DEVICE_ID "IOT_28"//Device ID mentioned in ibm watson IOT Platform
20 #define TOKEN "6&3V10StqZ9kN(3r2P" //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
28 char subscribtopic[] = "iot-2/cmd/test/fmt/String";// cmd REPRESENT command
29 char authMethod[] = "use-token-auth";// authentication method
30 char token[] = TOKEN;
```

Simulation output:

```
Distance (inch): 85.41
Sending payload: {"Distance (cm)":216.94}
Publish ok
Distance (cm): 216.97
Distance (inch): 85.42
Sending payload: {"Distance (cm)":216.97}
Publish ok
```

The screenshot shows the IBM Watson IoT Platform interface. The 'Recent Events' tab is selected, displaying a table of events received from the device. The table has columns for Event, Value, Format, and Last Received. The events show a sequence of distance readings in centimeters, each formatted as a JSON string.

Event	Value	Format	Last Received
Data	{"Distance (cm)":217.01}	json	a few seconds ago
Data	{"Distance (cm)":216.94}	json	a minute ago
Data	{"Distance (cm)":216.94}	json	a minute ago
Data	{"Distance (cm)":217.38}	json	2 minutes ago
Data	{"Distance (cm)":216.97}	json	2 minutes ago