

Assignment 4

ESP32 Program

Assignment Date	01 November 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.

The screenshot displays the Wokwi simulation interface. On the left, the code editor shows the following C++ code for an ESP32:

```
1 #include <WiFi.h>
2 #include <Wire.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* topic, byte* payload, unsigned int payloadLength);
15 //-----credentials of IBM Accounts-----
16
17 #define ORG "flag7a"//IBM ORGANIZATION ID
18 #define DEVICE_TYPE "ultrasonic"//Device type mentioned in the Watson IoT Platform
19 #define DEVICE_ID "shd_2"//Device ID mentioned in the Watson IoT Platform
20 #define TOKEN "CVUkKfQu67sa_RkQ" //Token
21 String data;
22
23
24
25 //----- Customise the above values -----
26 char server[] = ORG ".messaging.internetofthings.ibmcloud.com";// Server name
27 char publishTopic[] = "iot-2/ext/data/fmt/json";// topic name and type of event perform
28 char subscribeTopic[] = "iot-2/cmd/test/fmt/String";// cmd_REFRESH command type AND CO
29 char authMethod[] = "use-token-auth";// authentication method
30 char token[] = TOKEN;
31 char clientId[] = "d1" 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 a circuit diagram with 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 simulation status bar at the top right shows a green play button, a stop button, and a pause button, along with the text "Simulation" and "01:37.753 99%".

Below the circuit diagram, the console output shows the following messages:

```
Publish ok
Distance (cm): 216.94
Distance (inch): 85.41
Sending payload: {"Distance (cm)":216.94}
Publish ok
Reconnecting client to flag7a.messaging.internetofthings.ibmcloud.com
..
```



Browse Action Device Types Interfaces

Add Device

Device ID	Status	Device Type	Class ID	Date Added	Descriptive Location
shul_2	Disconnected	ultrasonic	Device	Oct 27, 2022 1:52 PM	

Identity Device Information Recent Events State Logs

The recent events listed show the live stream of data that is coming and going from this device.

Event	Value	Format	Last Received
Data	("Distance (cm)":235.94)	json	a few seconds ago
Data	("Distance (cm)":235.97)	json	a few seconds ago
Data	("Distance (cm)":235.94)	json	a few seconds ago
Data	("Distance (cm)":235.94)	json	a few seconds ago
Data	("Distance (cm)":235.94)	json	a few seconds ago