

Assignment - 4 Wowki & IBM Cloud

Assignment Date	27 October 2022
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Maximum Marks	2 Marks

Question-1:

Write code and connections in wowki for the ultrasonic sensor. Whenever the distance is less than 100cms sent "alert" to IBM cloud and display in device recent events.

Code:

```
#include <WiFi.h>
#include <PubSubClient.h>
#include <ArduinoJson.h>

WiFiClient wifiClient;

#define ORG "42cic2"
#define DEVICE_TYPE "sudharshanlaptop"
#define DEVICE_ID "12345"
#define TOKEN "*zSbeu!vc(!+Xn@520 "
#define speed 0.034
char server[] = ORG
".messaging.internetofthings.ibmcloud.com"; char publishTopic[]
= "iot-2/evt/abcd_1/fmt/json"; char topic[] = "iot-
2/cmd/home/fmt/String"; char authMethod[] = "use-token-auth";
char token[] = TOKEN;
char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;
PubSubClient client(server, 1883, wifiClient); void
publishData();
const int trigpin=5;
const int echopin=18;
String command;
String data="";
String lat="14.167589";
String lon="80.248510";
String name="point2";
String icon="";
```

```

    long
duration; int
dist;
void setup()
{
    Serial.begin(115200);
    pinMode(trigpin, OUTPUT);
    pinMode(echopin, INPUT);
    wifiConnect();    mqttConnect();
}
void loop() {

publishData();
delay(500);
    if (!client.loop())
{
    mqttConnect();
}
}
void wifiConnect() {
    Serial.print("Connecting to "); Serial.print("Wifi");
    WiFi.begin("Wokwi-GUEST", "", 6);    while
(WiFi.status() != WL_CONNECTED) {    delay(500);
        Serial.print(".");
    }
    Serial.print("WiFi connected, IP address: "); Serial.println(WiFi.localIP());
} void mqttConnect() {    if
(!client.connected()) {
        Serial.print("Reconnecting MQTT client to "); Serial.println(server);
while (!client.connect(clientId, authMethod, token)) {
Serial.print(".");    delay(1000);
    }
    initManagedDevice();
    Serial.println();
}
} void initManagedDevice() {
if (client.subscribe(topic)) {
    Serial.println(client.subscribe(topic));
    Serial.println("subscribe to cmd OK");
} else {
    Serial.println("subscribe to cmd FAILED");
}
}
void publishData()
{    digitalWrite(trigpin, LOW);
digitalWrite(trigpin, HIGH);
delayMicroseconds(10);
digitalWrite(trigpin, LOW);
duration=pulseIn(echopin, HIGH);
dist=duration*speed/2;
    if(dist<100){
dist=100-dist;
icon="fa-trash";

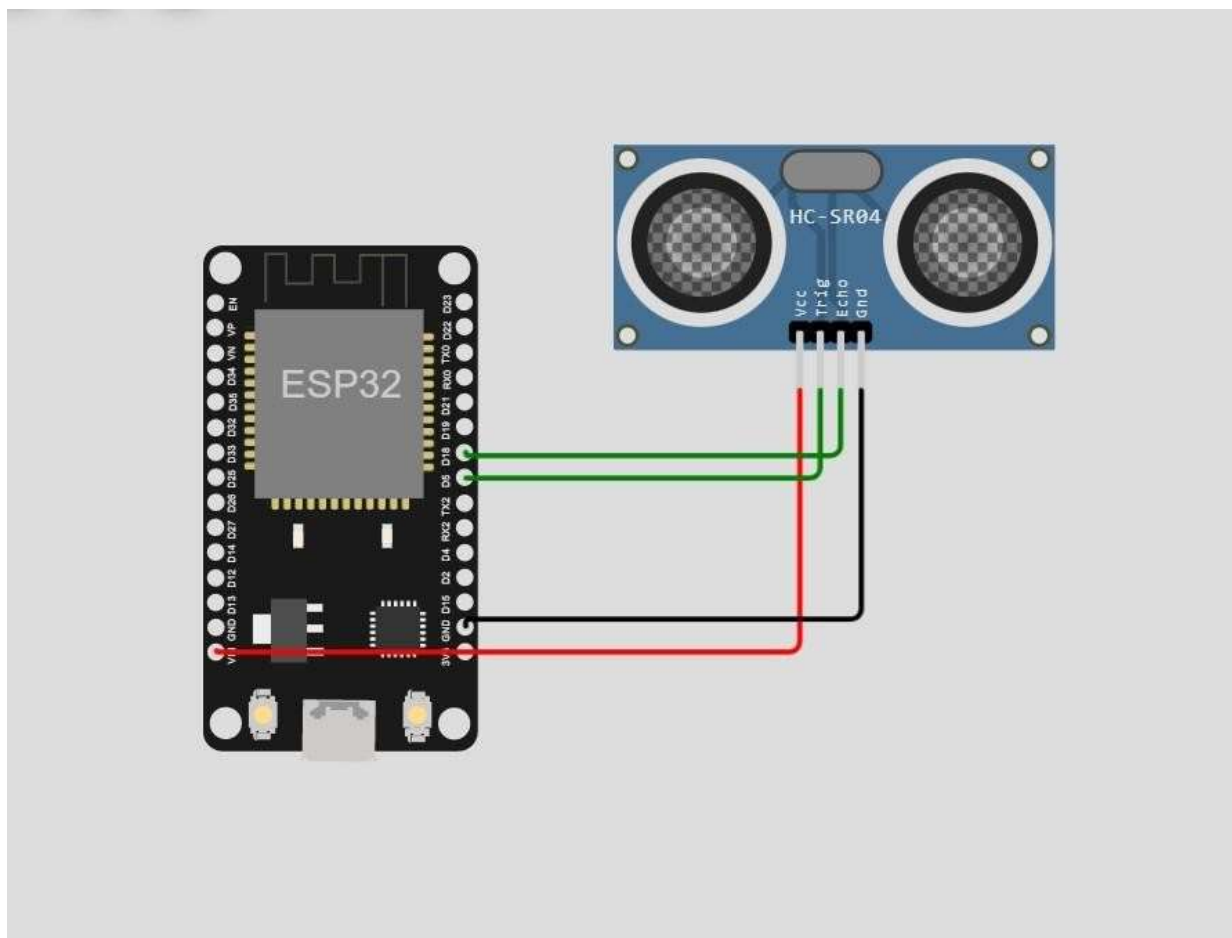
```

```

}else{    dist=0;
icon="fa-trash-o";
    }
    DynamicJsonDocument doc(1024);
String payload;    doc["Name"]=name;
doc["Latitude"]=lat;
doc["Longitude"]=lon;
doc["Icon"]=icon;
doc["FillPercent"]=dist;
serializeJson(doc, payload);
delay(3000);
    Serial.print("\n");
    Serial.print("Sending payload: ");
Serial.println(payload);
    if (client.publish(publishTopic, (char*) payload.c_str())) {
        Serial.println("Publish OK");
    } else {
        Serial.println("Publish FAILED");
    }
}
}

```

Connections:



Output:

The screenshot shows the Wokwi web interface. On the left, the sketch code is as follows:

```
14 char publishTopic[] = "iot-2/evt/abcd_1/twt/json";
15 char topic[] = "iot-2/cmd/home/fmt/String";
16 char authMethod[] = "use-token-auth";
17 char token[] = TOKEN;
18 char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;
19 PubSubClient client(server, 1883, wifiClient);
20 void publishData();
21
22 const int trigpin=5;
23 const int echopin=18;
24 String command;
25 String data="";
26 String lat="14.167589";
27 String lon="80.248510";
28 String name="point2";
29 String icon="";
30
31 long duration;
32 int dist;
33
34 void setup()
35 {
36   Serial.begin(115200);
37   pinMode(trigpin, OUTPUT);
38   pinMode(echopin, INPUT);
39   wifiConnect();
40   mqttConnect();
41 }
42
43 void loop() {
44   publishData();
45   delay(500);
46 }
```

On the right, the simulation shows an ESP32 microcontroller connected to an HC-SR04 ultrasonic sensor. The console output displays the sensor's range-finding process and the resulting JSON payload published to the IBM Watson IoT platform:

```
trash", "FillPercent":47}
Publish OK

Sending payload:
{"Name":"point2","Latitude":"14.167589","Longitude":"80.248510","Icon":"fa-trash", "FillPercent":47}
Publish OK
```

Output:(IBM Cloud)

The screenshot shows the IBM Watson IoT Platform dashboard. The 'Browse' tab is selected, displaying a table of recent events. The table has four columns: Event, Value, Format, and Last Received. The events are as follows:

Event	Value	Format	Last Received
event_1	{"alert distance":85}	json	a few seconds ago
event_1	{"alert distance":15}	json	a few seconds ago
event_1	{"alert distance":12}	json	a few seconds ago
event_1	{"alert distance":33}	json	a few seconds ago
event_1	{"alert distance":33}	json	a few seconds ago

At the bottom of the dashboard, a status bar indicates "1 Simulation running".

Link :<https://wokwi.com/projects/346857404558738004>