

Assignment -4

Assignment Date	02 November 2022
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Maximum Marks	2 Marks
Team ID	PNT2022TMID11664

Question:

Write code and connections in wokwi for the ultrasonic sensor. Whenever the distance is less than 100 cms send an "alert" to the IBM cloud and display in the device recent events. Upload document with wokwi share link and images of IBM cloud.

Code:

```
#include <WiFi.h>
#include <PubSubClient.h> void callback(char* subscribetopic,
byte* payload, unsigned int payloadLength);
//-----credentials of IBM Accounts-----
#define ORG "qsvkr1"//IBM ORGANITION ID
#define DEVICE_TYPE "2k19ece002"//Device type mentioned in ibm watson IOT Platform
#define DEVICE_ID "2k19ece002"//Device ID mentioned in ibm watson IOT Platform
#define TOKEN "Arshaath" //Token String data3; char server[] =
ORG ".messaging.internetofthings.ibmcloud.com"; char
publishTopic[] = "iot-2/evt/Data/fmt/json"; char
subscribetopic[] = "iot-2/cmd/test/fmt/String"; char
authMethod[] = "use-token-auth"; char token[] = TOKEN;
char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;
WiFiClient wifiClient;
PubSubClient client(server, 1883, callback
,wifiClient); const int trigPin = 25; const int echoPin
= 14; #define SOUND_SPEED 0.034 long duration; float
distance; void setup() { Serial.begin(115200);
pinMode(trigPin, OUTPUT); pinMode(echoPin, INPUT);
wificonnect(); mqttconnect();
}
void loop()
{ digitalWrite(trigPin,
LOW); delayMicroseconds(2);
digitalWrite(trigPin,
HIGH);
delayMicroseconds(10);
digitalWrite(trigPin, LOW);
```

```

duration = pulseIn(echoPin, HIGH); distance
= duration * SOUND_SPEED/2;
Serial.print("Distance (cm): ");
Serial.println(distance); if(distance<100)
{
Serial.println("ALERT!!"); delay(1000);
PublishData(distance);
delay(1000); if
(!client.loop()) {
mqttconnect();
} }
delay(1000);
} void PublishData(float dist)
{ mqttconnect();
String payload = "{\"Distance\":\""; payload += dist;
payload += "\", \"ALERT!!\":\"\"Distance less than 100cms\"";
payload += "}";
Serial.print("Sending payload: "); Serial.println(payload);
if (client.publish(publishTopic, (char*) payload.c_str())) {
Serial.println("Publish ok");
} else {
Serial.println("Publish failed");
} } void mqttconnect() {
if (!client.connected()) {
Serial.print("Reconnecting client to "); Serial.println(server);
while (!!!client.connect(clientId, authMethod, token)) {
Serial.print("."); delay(500);
}
}
initManagedDevice();
Serial.println();
} } void
wificonnect()
{
Serial.println(); Serial.print("Connecting to ");
WiFi.begin("Wokwi-GUEST", "", 6); while (WiFi.status() !=
WL_CONNECTED) { delay(500);
Serial.print(".");
}
Serial.println(""); Serial.println("WiFi connected"); Serial.println("IP address: ");
Serial.println(WiFi.localIP());
} void initManagedDevice()
{

```

```

if (client.subscribe(subscribetopic)) {
  Serial.println((subscribetopic)); Serial.println("subscribe to cmd OK"); }
else {
  Serial.println("subscribe to cmd FAILED");
} } void callback(char* subscribetopic, byte* payload, unsigned int
payloadLength) {
  Serial.print("callback invoked for topic: "); Serial.println(subscribetopic);
  for (int i = 0; i < payloadLength; i++) {
    //Serial.print((char)payload[i]); data3
    += (char)payload[i];
  }
  Serial.println("data: "+ data3); data3="";
}

```

Wokwi Output:

The screenshot displays the Wokwi IDE interface. On the left, the sketch.ino file contains the following code:

```

1 #include <WiFi.h>
2 #include <PubSubClient.h>
3 void callback(char* subscribetopic, byte* payload, unsigned int
4 payloadLength);
5 //-----credentials of IBM Accounts-----
6 #define ORG "qsvkr1"//IBM ORGANIZATION ID
7 #define DEVICE_TYPE "2k19ece002"//Device type mentioned in ibm watson IOT Platform
8 #define DEVICE_ID "2k19ece002"//Device ID mentioned in ibm watson IOT Platform
9 #define TOKEN "Arshaath" //Token
10 String data3;
11 char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
12 char publishTopic[] = "iot-2/evt/Data/fmt/json";
13 char subscribetopic[] = "iot-2/cmd/test/fmt/String";
14 char authMethod[] = "use-token-auth";
15 char token[] = TOKEN;
16 char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;
17 WiFiClient wificlient;
18 PubSubClient client(server, 1883, callback ,wificlient);
19 const int trigPin = 25;
20 const int echoPin = 14;
21 #define SOUND_SPEED 0.034
22 long duration;
23 float distance;
24 void setup() {
25   Serial.begin(115200);
26   pinMode(trigPin, OUTPUT);
27   pinMode(echoPin, INPUT);
28   wificlient.connect();
29   mqttconnect();
30 }
31 void loop()
32 {
33   digitalWrite(trigPin, LOW);
34   delayMicroseconds(2);
35   digitalWrite(trigPin, HIGH);
36   delayMicroseconds(10);
37   digitalWrite(trigPin, LOW);
38   duration = pulseIn(echoPin, HIGH);

```

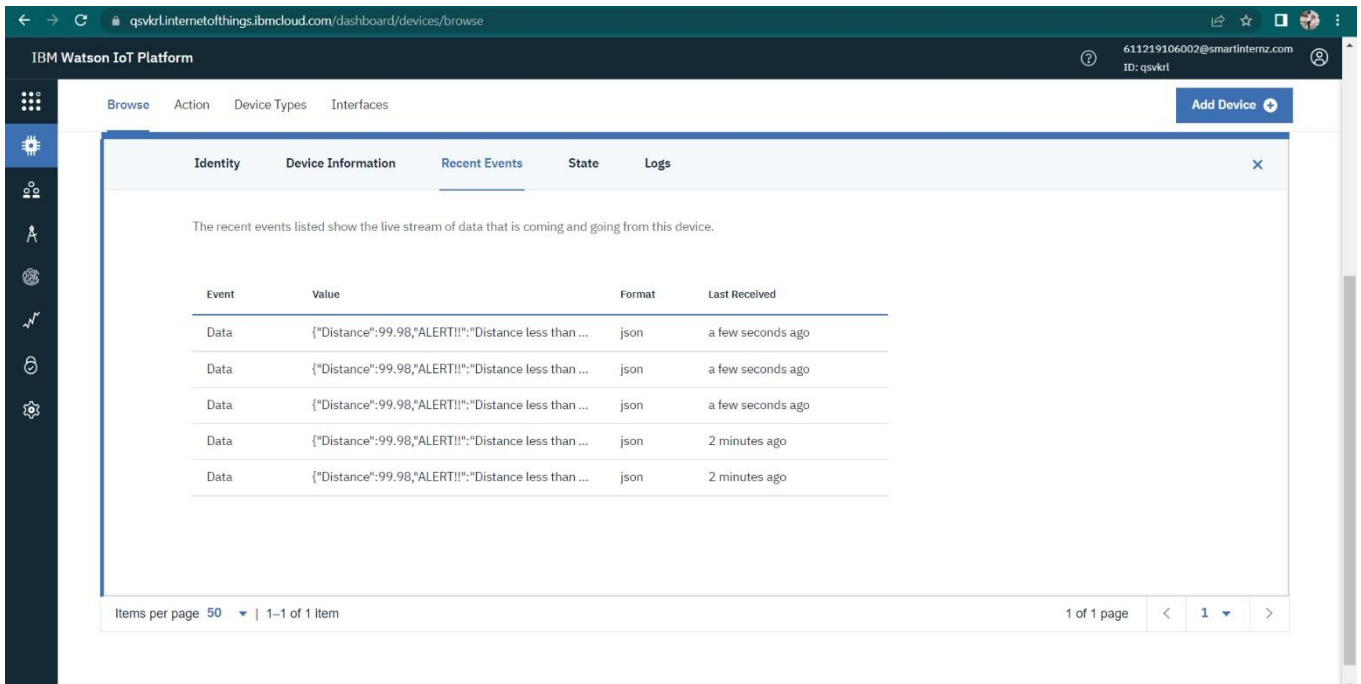
The right side of the IDE shows a simulation window with a visual representation of the ESP32 and the HC-SR04 sensor connected by wires. Below the simulation, the serial output log shows the following sequence of events:

```

Publish ok
Distance (cm): 99.98
ALERT!!
Sending payload: {"Distance":99.98,"ALERT!!":"Distance less than 100cms"}
Publish ok
Reconnecting client to qsvkr1.messaging.internetofthings.ibmcloud.com

```

IBM Cloud Alert:



IBM Watson IoT Platform

611219106002@smarinternz.com
ID: qsvkr

Browse Action Device Types Interfaces

Add Device

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":99.98,"ALERT!!":"Distance less than ...	json	a few seconds ago
Data	{"Distance":99.98,"ALERT!!":"Distance less than ...	json	a few seconds ago
Data	{"Distance":99.98,"ALERT!!":"Distance less than ...	json	a few seconds ago
Data	{"Distance":99.98,"ALERT!!":"Distance less than ...	json	2 minutes ago
Data	{"Distance":99.98,"ALERT!!":"Distance less than ...	json	2 minutes ago

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Wokwi Share Link:

<https://wokwi.com/projects/347278397539353172>