

ASSIGNMENT - 4

DATE	17 October 2022
TEAM ID	PNT2022TMID07000
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STUDENT ROLL NUMBER	GCTC1918115
MAXIMUM MARKS	2 Marks

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 CODE AND IMPLEMENTATION LINK:

<http://wokwi.com/projects/346660250623935059>

CODE:

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

```
1 #include <WIFI.h> //library for wifi
2 #include <PubSubClient.h> //library for Mqtt
3
4 void callback(char *topic, byte *payload, unsigned int payloadLength);
5
6 //-----credentials of IBM Accounts -----
7
8 #define ORG "dz59yw" //IBM ORGANIZATION ID
9 #define DEVICE_TYPE "device_1" //Device type mentioned in ibm watson IOT Platform
10 #define DEVICE_ID "weatherdevice_ID" //Device ID mentioned in ibm watson IOT Platform
11 #define TOKEN "_yH+fzag!5&o(G833" //Token
12
13
14
15 float dist;
16
17 char server[] = ORG ".messaging.internetofthings.ibmcloud.com"; // Server Name
18 char publishTopic[] = "iot-2/evt/Data1/fmt/json"; // topic name and type of event perform and format in
19 char subscribTopic[] = "iot-2/cmd/test/fmt/String"; // cmd REPRESENT command type AND COMMAND IS TEST
20 char authMethod[] = "use-token-auth"; // authentication method
21 char token[] = TOKEN;
22 char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID; //client id
23
24 Wifclient wifclient; // creating the instance for wifclient
25
26 PubSubClient client (server,1883, callback,wifclient); //calling the predefined client
27
28 int LED = 4;
29
30 int trig =5;
31
32 int echo= 18;
33
34 void setup()
35 {
```

On the right, the 'Simulation' window shows a visual representation of the hardware: an ESP8266 module connected to an HC-SR04 ultrasonic sensor. Below the simulation, the console output shows the following log messages:

```
Publish ok
Distance in cm : 189.61
no object found
Sending payload: {"distance":189.61,"object":"No object found"}
Publish ok
Reconnecting client to dz59yw.messaging.internetofthings.ibmcloud.com
.....
```

W sketchino - Wokwi Arduino and x | Untitled document - Google Do x | +

wokwi.com/projects/346660250623935059

WOKWI SAVE SHARE

Docs

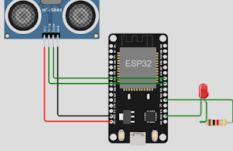
sketch.ino diagram.json libraries.txt Library Manager

```

35 {
36
37   Serial.begin(115200);
38   pinMode(trig, OUTPUT);
39   pinMode(echo, INPUT);
40   pinMode(LED, OUTPUT);
41   delay(10);
42
43   wificonnect();
44   mqttconnect();
45
46 }
47
48
49 void loop()// Recursive Function
50 {
51   delayMicroseconds(10);
52   digitalWrite(trig, LOW);
53   digitalWrite(trig, LOW);
54   digitalWrite(trig, HIGH);
55   float dur= pulseIn(echo,HIGH);
56   float dist = (dur* 0.0343)/2;
57   Serial.print ("Distance in cm : ");
58   Serial.println(dist);
59
60   PublishData(dist);
61
62   delay(1000);
63
64   if (!client.loop()) {
65     mqttconnect();
66   }
67
68 }
69

```

Simulation



Publish ok
Distance in cm : 189.61
no object found
Sending payload: {"distance":189.61,"object":"No object found"}
Publish ok
Reconnecting client to dz59yw.messaging.internetofthings.ibmcloud.com
.....

32°C Haze

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WOKWI SAVE SHARE

Docs

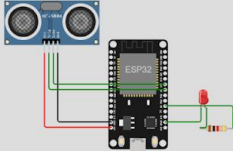
sketch.ino diagram.json libraries.txt Library Manager

```

105 }
106 }
107
108 void mqttconnect() {
109   if (!client.connected()) {
110     Serial.print("Reconnecting client to ");
111     Serial.println(server);
112     while (!client.connect(clientId, authMethod, token)) {
113       Serial.print(".");
114       delay(500);
115     }
116   }
117   initManagedDevice();
118   Serial.println();
119 }
120
121
122 void wificonnect() //function definition for wificonnect
123 {
124   Serial.println();
125   Serial.print("Connecting to ");
126
127   WiFi.begin("wokwi-GUEST", "", 6);//passing the wifi credentials to establish the connection
128   while (WiFi.status() != WL_CONNECTED) {
129     delay(500);
130     Serial.print(".");
131   }
132   Serial.println("");
133   Serial.println("WiFi connected");
134   Serial.println("IP address: ");
135   Serial.println(WiFi.localIP());
136 }
137
138
139 void initManagedDevice() {

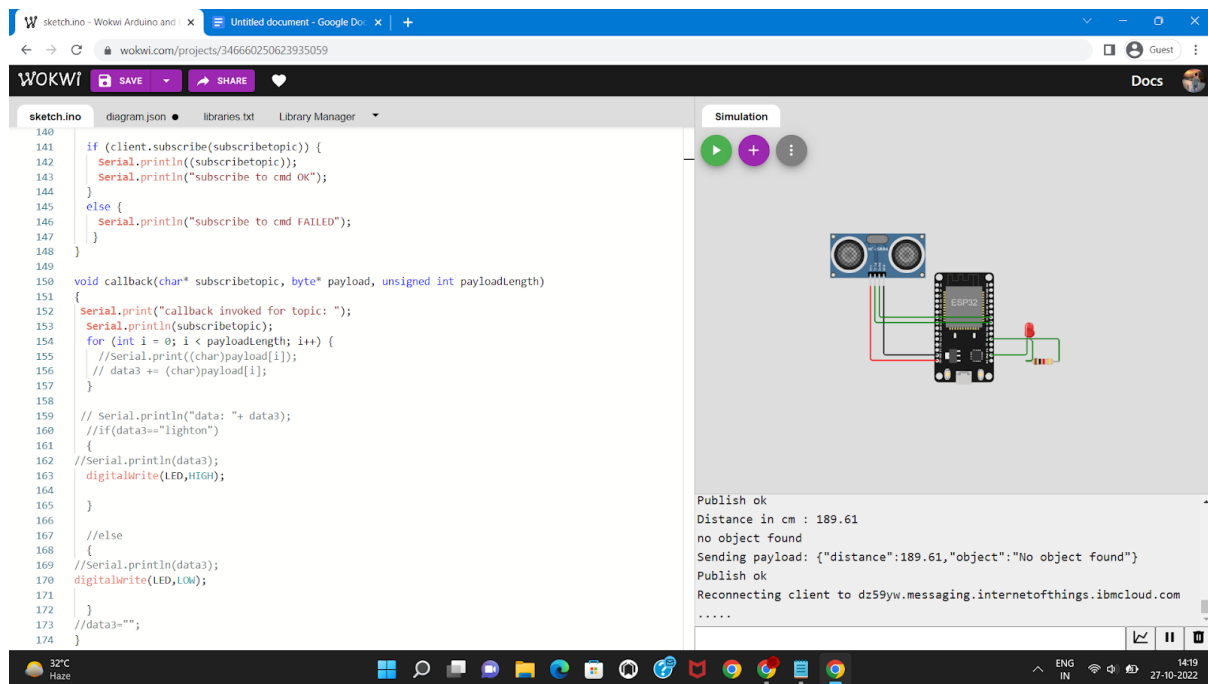
```

Simulation



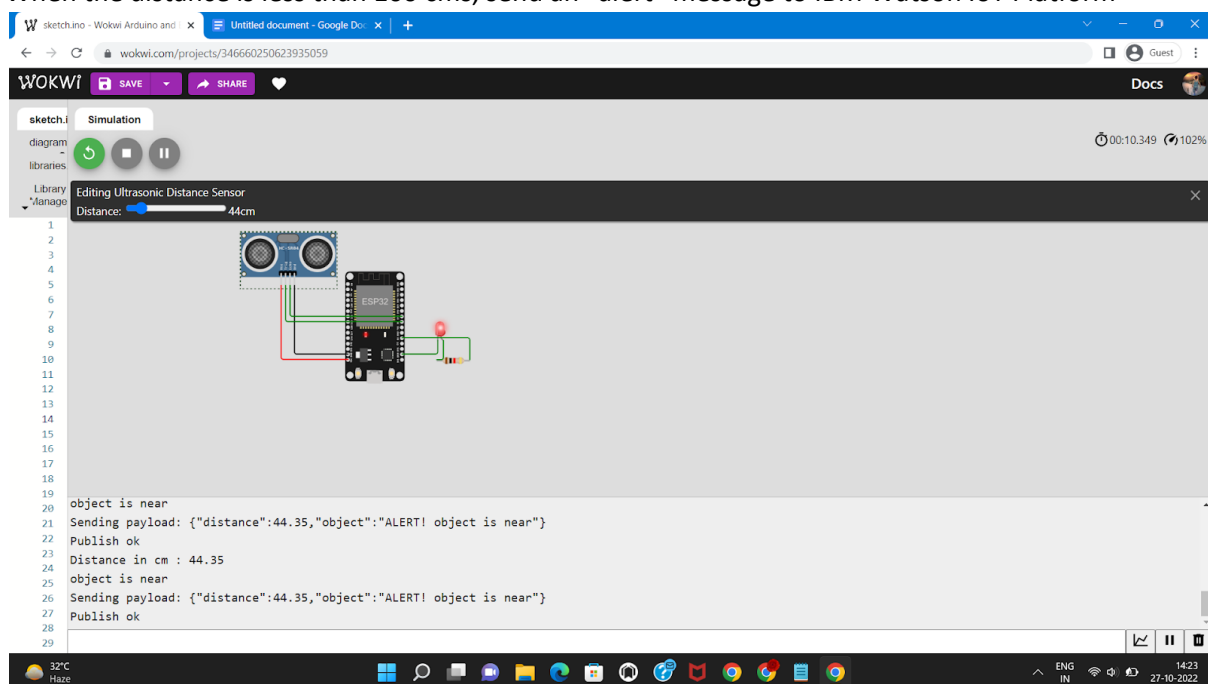
Publish ok
Distance in cm : 189.61
no object found
Sending payload: {"distance":189.61,"object":"No object found"}
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Reconnecting client to dz59yw.messaging.internetofthings.ibmcloud.com
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32°C Haze

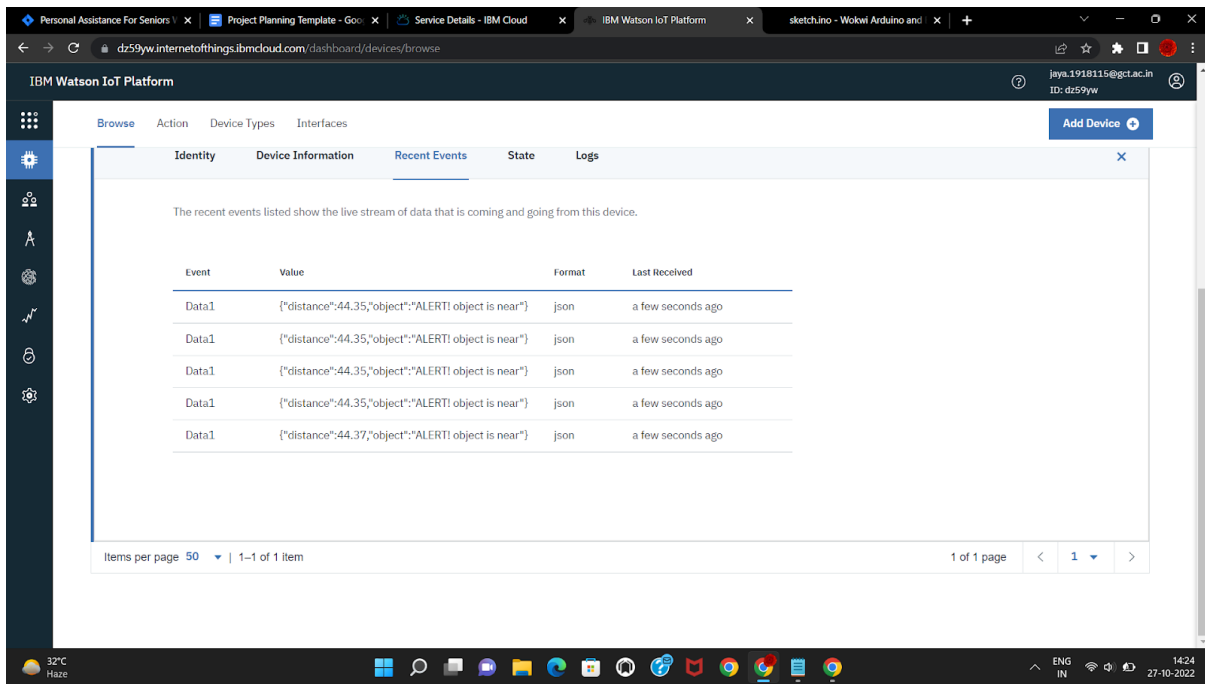


OUTPUT:

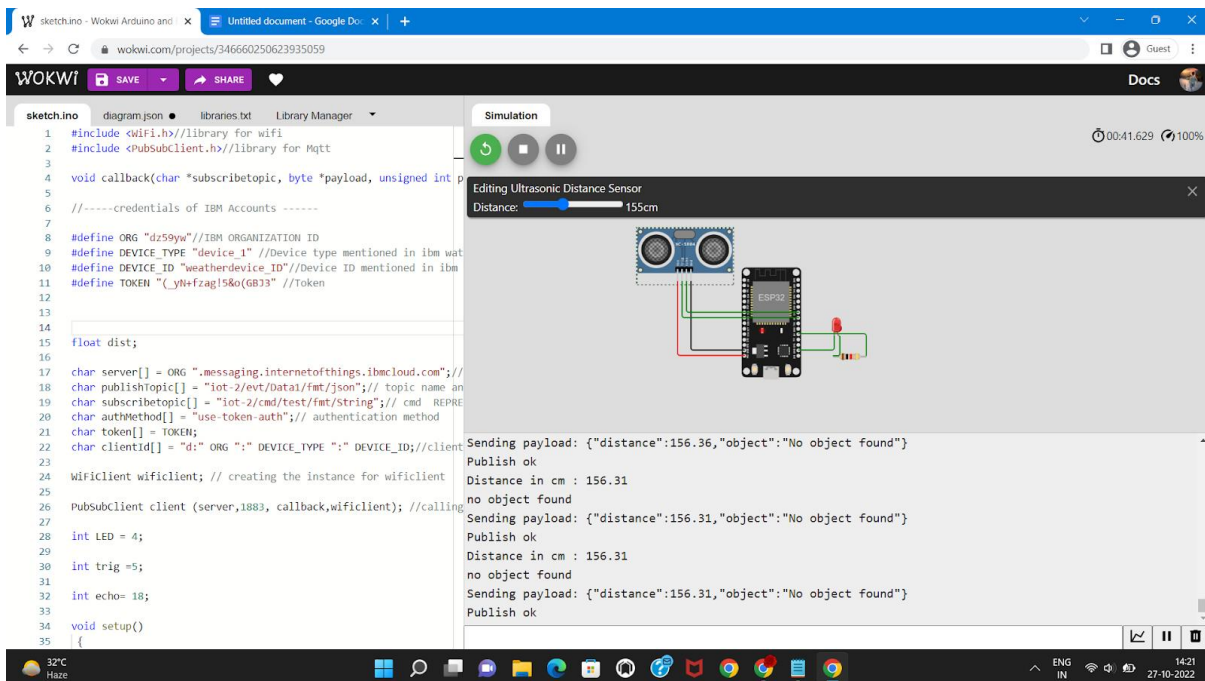
When the distance is less than 100 cms, send an “alert” message to IBM Watson IoT Platform



IBM CLOUD IMAGE



When the object is far(greater than 100 cms) , send “ no object found” to the IBM Watson IOT Platform.



IBM CLOUD IMAGE

The screenshot shows the IBM Watson IoT Platform interface. The top navigation bar includes 'Browse', 'Action', 'Device Types', and 'Interfaces'. The main content area displays the 'Recent Events' for a device named 'weatherdevice_ID'. The device is in a 'Connected' state. Below the device header, there are tabs for 'Identity', 'Device Information', 'Recent Events' (selected), 'State', and 'Logs'. A message states: 'The recent events listed show the live stream of data that is coming and going from this device.' Below this, a table lists recent events:

Event	Value	Format	Last Received
Data1	{"distance":156.31,"object":{"No object found"}}	json	a few seconds ago
Data1	{"distance":156.31,"object":{"No object found"}}	json	a few seconds ago
Data1	{"distance":156.31,"object":{"No object found"}}	json	a few seconds ago
Data1	{"distance":156.31,"object":{"No object found"}}	json	a few seconds ago
Data1	{"distance":156.31,"object":{"No object found"}}	json	a few seconds ago

At the bottom, it shows 'Items per page 50' and '1 - 1 of 1 item'.