

Assignment -4

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| Project | Real-Time River Water Quality Monitoring and Control System |

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

The image displays two screenshots of the Wokwi IDE interface, showing the code for an ESP32 project. The first screenshot shows the initial code setup, including MQTT connection and distance measurement. The second screenshot shows the completed code, which includes a loop and a conditional alert system.

First Screenshot Code:

```

67 Serial.println("no object found");
68 object="No";
69 }
70 String payload="(\"distance\");";
71 payload +=dist;
72 payload +="," "\object\":";
73 payload += object;
74 payload += "\n";
75
76 Serial.print("Sending payload: ");
77 Serial.println(payload);
78 if(client.publish(topic, (char*) payload.c_str())){
79   Serial.println("Publish ok");/* If its successfully upload data on the cloud then it will print
80   publish ok in serial monitor or else it will print publish failed*/
81 } else{
82   Serial.println("Publish failed");
83 }
84
85 void mqttconnect(){
86   if(!client.connected()){
87     Serial.print("Reconnecting client to ");
88     Serial.println(server);
89     while(!client.connect(clientid,authMethod, token)){
90       Serial.print('.');
91       delay(500);
92     }
93     initManagedDevice();
94     Serial.println();
95   }
96 }
97 void wificonnect();//function definition for wificonnect
98 {
99   Serial.println();

```

Second Screenshot Code:

```

28 wificonnect();
29 mqttconnect();
30 }
31 void loop();//recursive function
32 {
33   digitalWrite(trig,LOW);
34   digitalWrite(trig,HIGH);
35   delayMicroseconds(10);
36   digitalWrite(trig,LOW);
37   float dur=pulseIn(echo,HIGH);
38   float dist=(dur * 0.0343)/2;
39   Serial.print("distance in cm");
40   Serial.println(dist);
41   PublishData(dist);
42   delay(1000);
43   if (!client.connected()){
44     mqttconnect();
45   }
46 }
47 /*.....retriving to cloud.....
48 void PublishData(float dist){
49   mqttconnect();//function call for connecting to ibm
50   /*creating the string in form of JSON to update the data to ibm cloud*/
51   String object;
52   if(dist<100)
53   {
54     digitalWrite(LED,HIGH);
55     Serial.println("no object is near");
56     object="Near";
57   }
58   else
59   {
60     digitalWrite(LED,LOW);

```

New ESP32 Project - Wokwi Sim

wokwi.com/projects/new/esp32

WOKWI SAVE SHARE Docs

sketch.ino diagram.json Library Manager

```

130 //Serial.println(data3);
131 //digitalWrite(LED,HIGH);
132 //}
133 //else
134 //{
135 //Serial.println(data3);
136 //digitalWrite(LED,LOW);
137 //}
138 data3="";
139 }

```

Simulation

26°C Cloudy

New ESP32 Project - Wokwi Sim

wokwi.com/projects/new/esp32

WOKWI SAVE SHARE Docs

sketch.ino diagram.json Library Manager

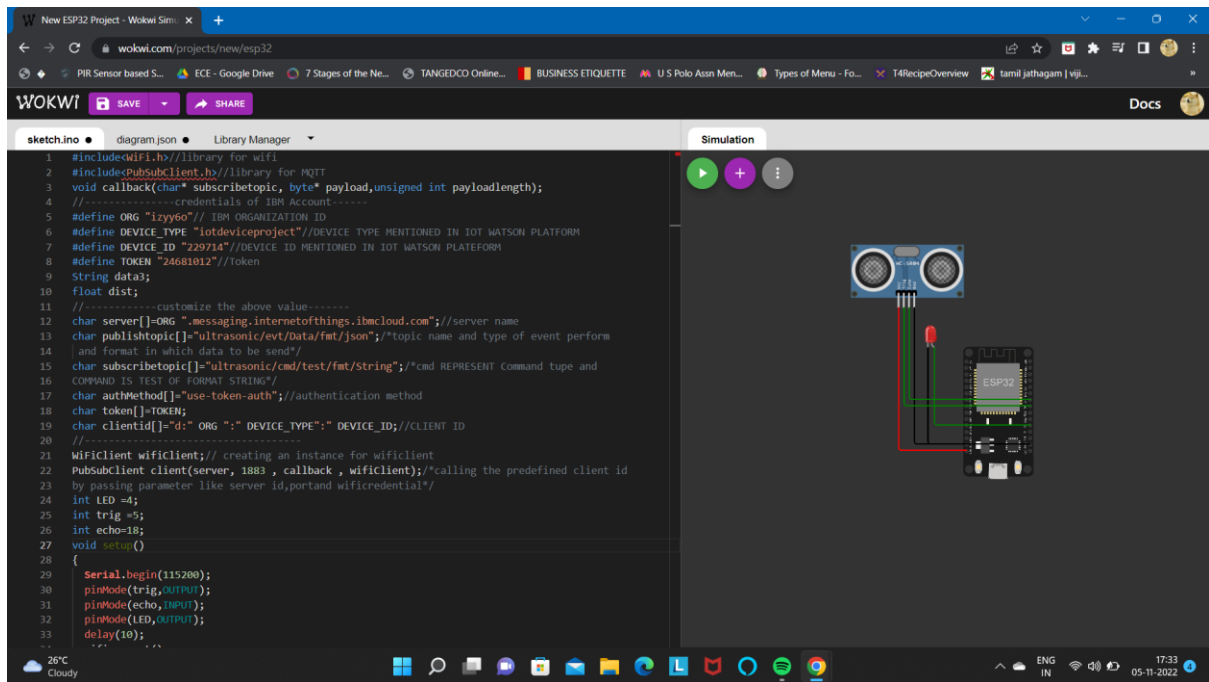
```

98 {
99   Serial.println();
100   Serial.print("Connecting to ");
101   WiFi.begin("wokwi.GUEST", ""); //PASSING THE WIFI CREDENTIALS TO ESTABLISH CONNECTION
102   while (WiFi.status() != WL_CONNECTED) {
103     delay(500);
104     Serial.print(".");
105   }
106   Serial.println("");
107   Serial.println("Wifi connected");
108   Serial.println("IP address");
109   Serial.println(WiFi.localIP());
110 }
111 void initManagedDevice() {
112   if (client.subscribe(subscribetopic)) {
113     Serial.println((subscribetopic));
114     Serial.println("subscribe to cmd OK");
115   } else {
116     Serial.println("subscribe to cmd failed");
117   }
118 }
119 void callback(char* subscribetopic, byte* payload, unsigned int payloadLength)
120 {
121   Serial.print("callback invoked for topic: ");
122   Serial.println(subscribetopic);
123   for (int i = 0; i < payloadLength; i++) {
124     //Serial.print((char)payload[i]);
125     data3 += (char)payload[i];
126   }
127   //Serial.println("dta: " + data3);
128   //if (data3 == "Near")
129   //{
130     //Serial.println(data3);

```

Simulation

26°C Cloudy



<https://wokwi.com/projects/347489586971148882>

Browse

Action

Device Types

Interfaces

Add Device

▼

■

DISTANCEDETECT

Disconnected

ULTRASON

Device

Oct 20, 2022 9:46 AM

→ ...

Identity

Device Information

Recent Events

State

Logs

✕

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

| Event | Value | Format | Last Received |
|-------|------------------------------------|--------|-------------------|
| Data | {"distance":79.66,"object":"Near"} | json | a few seconds ago |
| Data | {"distance":79.64,"object":"Near"} | json | a few seconds ago |
| Data | {"distance":79.66,"object":"Near"} | json | a few seconds ago |
| Data | {"distance":79.64,"object":"Near"} | json | a few seconds ago |
| Data | {"distance":79.66,"object":"Near"} | json | a few seconds ago |

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Data sent to the IBM Cloud Device when the object is near

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Data sent to the IBM Cloud Device when the object is far.