

## 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 ESP32 project interface, showing the code and simulation setup for an ultrasonic sensor connected to an ESP32 microcontroller.

**Top Screenshot:** The code in the sketch.ino file includes the following logic:

```

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 += "\";
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();

```

The simulation window shows the ESP32 board connected to an ultrasonic sensor (HC-SR04) via jumper wires. A OneDrive notification indicates a screenshot was saved.

**Bottom Screenshot:** The code in the sketch.ino file includes the following logic:

```

24 wificonnect();
25 mqttconnect();
26 }
27 void loop()//recursive function
28 {
29   digitalWrite(trig,LOW);
30   digitalWrite(trig,HIGH);
31   delayMicroseconds(10);
32   digitalWrite(trig,LOW);
33   float dur=pulseIn(echo,HIGH);
34   float dist=(dur * 0.0343)/2;
35   Serial.print("distance in cm");
36   Serial.println(dist);
37   PublishData(dist);
38   delay(1000);
39   if (!client.connected()){
40     mqttconnect();
41   }
42 }
43 /*.....retriving to cloud.....
44 void PublishData(float dist){
45   mqttconnect();//function call for connecting to ibm
46   /*creating the string in form of JSON to update the data to ibm cloud*/
47   String object;
48   if(dist<100)
49   {
50     digitalWrite(LED,HIGH);
51     Serial.println("no object is near");
52     object="near";
53   }
54   else
55   {
56     digitalWrite(LED,LOW);

```

The simulation window shows the same setup as the top screenshot, but the LED is now lit, indicating the alert condition (distance < 100 cm) has been triggered.

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wokwi.com/projects/new/esp32

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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

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W New ESP32 Project - Wokwi Sim... x +

wokwi.com/projects/new/esp32

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```

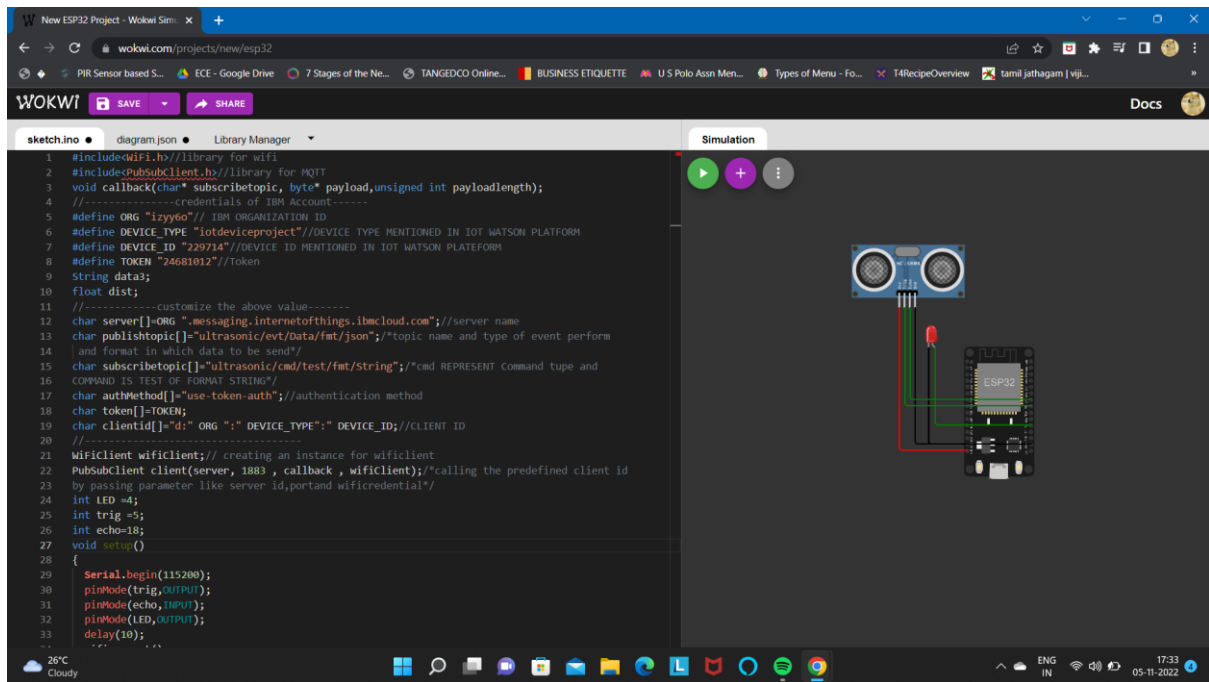
98 {
99   Serial.println();
100   Serial.print("Connecting to ");
101   WiFi.begin("wokwi.GUEST", ""); //PASSING THE WIFI CREDENTIALS TO ESTABLISH CONNECTION
102   while (WiFi.status() != WL_CONNECTED) {
103     delay(500);
104     Serial.print(".");
105   }
106   Serial.println("");
107   Serial.println("wifi 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

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<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

Items per page: 50

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1 of 1 page

1

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

<

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