

# ASSIGNMENT4

Date	08 OCTOBER 2022
Team ID	PNT2022TMID15007
Project Name	HAZARDOUS AREA MONITORING FOR INDUSTRIAL PLANT POWERED BY IOT

## Ultrasonic sensor simulation in Wokwi

### Question:

Write a code and connections in wokwi for the ultrasonic sensor. Whenever the distance is less than 100 cm, send an "Alert" to IBM cloud and display in the device recent events.

### Code:

```
#include
<WiFi.h>#include<PubSubC
lient.h>
voidcallback(char*subscribetopic,byte*payload,unsignedintpayloadLe
ngth);
//-----credentialsofIBMAccounts-----
#defineORG"s4jk68"//IBMORGANITIONID
#defineDEVICE_TYPE"MyDeviceType"//DevicetypementionedinibmwatsonIOTPlatform#define DEVICE_ID "12345"//Device
ID mentioned in ibmwatson IOT Platform
#defineTOKEN"12345"//Token
Stringdata3;
charserver[]=ORG".messaging.internetofthings.ibmcloud.com";charpub
lishTopic[]="iot-2/evt/Data/fmt/json";
charsubscribetopic[]="iot-
```

```

2/cmd/test/fmt/String";charauthMethod[]="use-token
auth";
char token[]=TOKEN;
char clientId[]="d:"ORG":"DEVICE_TYPE":"DEVICE_ID
; WiFiClient wifiClient;
PubSubClient client(server,1883,callback,wifiClient);consti
n t trigPin =5;
const int echoPin =
18;#define SOUND_SPEED 0.0
34 long duration;
float distance;
void setup(){
Serial.begin(115200);pinMod
e(trigPin,OUTPUT);pinMode(e
choPin,
INPUT);wifiConnect();mqttCo
nnect();
}
void loop()
{
digitalWrite(trigPin,
LOW);delayMicroseconds(2);digitalWr
ite(trigPin,
HIGH);delayMicroseconds(10);digital
Write(trigPin,LOW);duration =
pulseIn(echoPin,
HIGH);distance=duration*SOUND_SPEED
/2;Serial.print("Distance (cm):
");Serial.println(distance);if(dist
ance<100)
{
Serial.println("ALERT!!");de
lay(1000);
PublishData(distance);
delay(1000);
if(!client.loop()){mq
ttconnect();

```

```

}
}
delay(1000);
}
void PublishData(float dist){mqttconnect(
);
String payload="{\"Distance\":";payload+=
=dist;
payload+=",\"ALERT!!\":\"\"Distancelessthan100cms\"";payload+=
}\"";
Serial.print("Sendingpayload:");
Serial.println(payload);

if(client.publish(publishTopic,(char*)payload.c_str()))
{ Serial.println("Publishok");
}else{
Serial.println("Publishfailed");
}
}
void mqttconnect(){
if (!client.connected())
{Serial.print("Reconnectingclientto");S
erial.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("WiFiconnected");
Serial.println("IP address:
");Serial.println(WiFi.localIP());
}
voidinitManagedDevice(){
if (client.subscribe(subscribetopic))
{Serial.println((subscribetopic));
Serial.println("subscribe  tocmdOK");
}else{
Serial.println("subscribetocmdFAILED");
}
}
voidcallback(char*subscribetopic,byte*payload,unsignedintpayloadLength
) {
Serial.print("callbackinvokedfortopic:");
Serial.println(subscribetopic);
for(inti=0;i<payloadLength;i++){
//Serial.print((char)payload[i]);
data3+=(char)payload[i];
}
Serial.println("data:"+data3);data3="";
}

```

**Diagram.json:**

```

{
  "version":1,
  "author":
    "sweetysharon", "editor":
    "wokwi", "parts":[
      {"type":"wokwi-esp32-devkit-v1","id":"esp","top":-4.67,"left":-114.67,"attrs":{}}
    , {"type":"wokwi-hc-sr04","id":"ultrasonic1","top":15.96,"left":89.17,"attrs":{}}

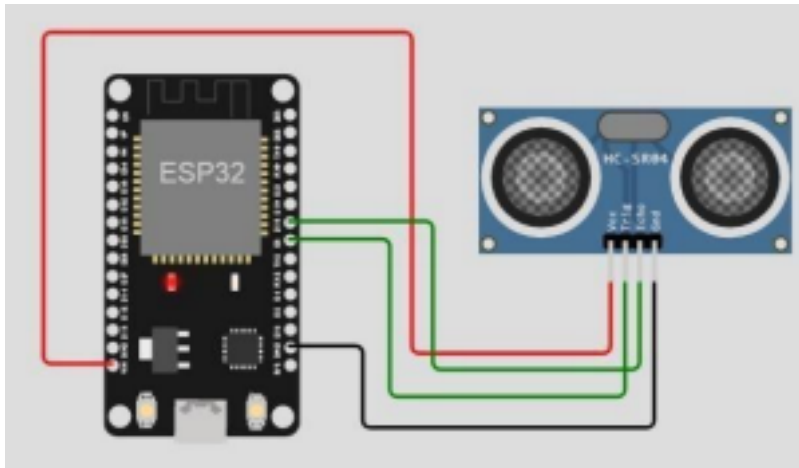
```

```

],
"connections":[
  ["esp:TX0","$serialMonitor:RX","",[]],
  ["esp:RX0","$serialMonitor:TX","",[]],["
    "esp:VIN","ultraso
    nic1:VCC","red",
    ["h-37.16","v-178.79","h200","v173.33","h100.67"]
  ],
  ["esp:GND.1","ultrasonic1:GND","black",["h39.87","v44.04","h170"]],
  ,
  ["esp:D5","ultrasonic1:TRIG","green",["h54.54","v85.07","h130.67"]
  ],
  ["esp:D18","ultrasonic1:ECHO","green",["h77.87","v80.01","h110"]]
]
}

```

#### CircuitDiagram:



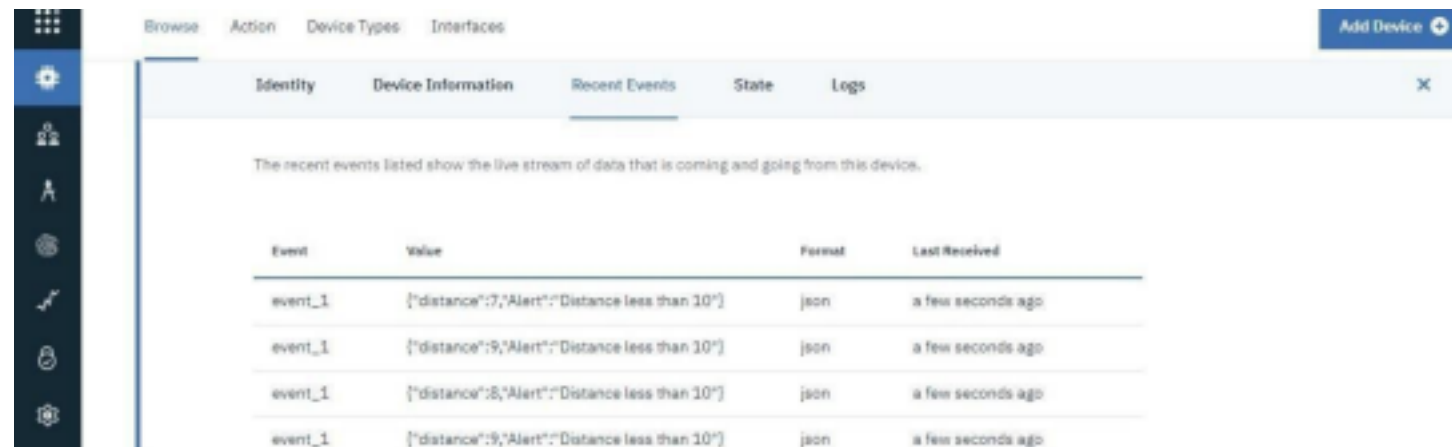
#### Output:

Wokwioutput:

```
Connecting to ....
Wifi connected
IP address:
10.10.0.2
Reconnecting client to ytiuse.messaging.internetofthings.ibmcloud.com
iot-2/cmd/test/fmt/String
subscribe to cmd OK

Distance (cm): 399.92
Distance (cm): 399.96
Distance (cm): 399.94
Distance (cm): 399.98
Distance (cm): 399.94
Distance (cm): 399.92
Distance (cm): 399.94
```

### IBMcloudoutput:



The screenshot shows the IBM Cloud IoT Platform console. The left sidebar contains navigation icons. The top navigation bar includes 'Browse', 'Action', 'Device Types', and 'Interfaces'. A 'Add Device' button is in the top right. The main content area is titled 'Identity', 'Device Information', 'Recent Events', 'State', and 'Logs'. The 'Recent Events' tab is selected, showing a message: 'The recent events listed show the live stream of data that is coming and going from this device.' Below this is a table with the following data:

Event	Value	Format	Last Received
event_1	{"distance":7,"Alert":"Distance less than 10"}	json	a few seconds ago
event_1	{"distance":9,"Alert":"Distance less than 10"}	json	a few seconds ago
event_1	{"distance":8,"Alert":"Distance less than 10"}	json	a few seconds ago
event_1	{"distance":9,"Alert":"Distance less than 10"}	json	a few seconds ago