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:

Writeacodeandconnectionsinwokwifortheultrasonicsensor.Whenteverthedistanceislessthan100cmssen d an“Alert” to IBM cloudanddisplayinthedevicerecentevents.

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";
chartoken[]=TOKEN;
charclientId[]="d:"ORG":"DEVICE_TYPE":"DEVICE_ID
; WiFiClientwifiClient;
PubSubClientclient(server,1883,callback,wifiClient);consti
n t trigPin =5;
const int echoPin =
18;#defineSOUND_SPEED0.0
34longduration;
floatdistance;
voidsetup(){
Serial.begin(115200);pinMod
e(trigPin,OUTPUT);pinMode(e
choPin,
INPUT);wificonnect();mqttco
nnect();
}
voidloop()
{
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);
    }
    voidPublishData(floatdist){mqttconnect(
    );
    Stringpayload="{\"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");
    }
    }
    voidmqttconnect(){
    if (!client.connected())
    {Serial.print("Reconnectingclientto");S
    erial.println(server);
    while(!!!client.connect(clientId,authMethod,token))
    { Serial.print(".");
    delay(500);
    }
initManagedDevice();
Serial.println();
}
}
voidwificonnect()
{
Serial.println(); Serial.print("Connecting to
");WiFi.begin("Wokwi-GUEST", "", 6); while (WiFi.status()
!=WL_CONNECTED){delay(500);
Serial.print(".");
```

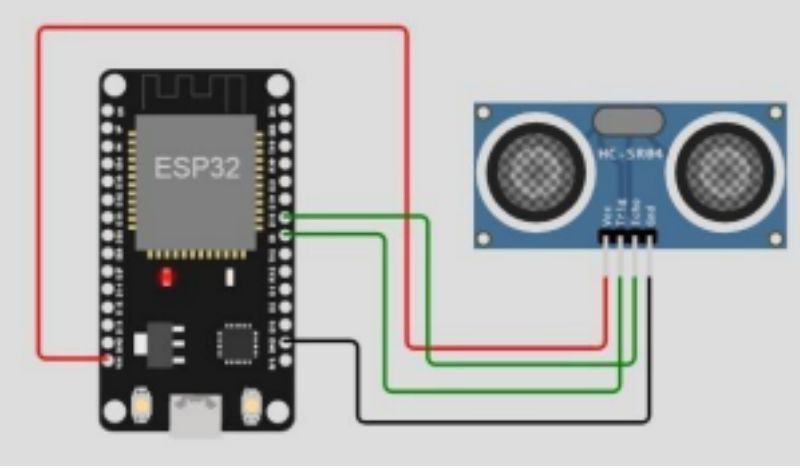
```
}
Serial.println("");
Serial.println("WiFiconnected");
Serial.println("IP address:
");Serial.println(WiFi.localIP());
}
voidinitManagedDevice(){
if (client.subscribe(subscribetopic))
{Serial.println((subscribetopic));
Serial.println("subscribe  tocmdOK");
}else{
Serial.println("subscribetocmdFAILED");
}
}
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 ytluse.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: