ASSIGNMENT-4

UltrasonicsensorsimulationinWokwi

TeamID	PNT2022TM11782
Title	GasLeakageMonitoringandAlertingSystem
Name	Tamilarasan V
MinimumMarks	2Marks

Question:

Write a code and connections in Wokwi for the Ultrasonic sensor.Whenever the distance is less than 100cms send an "Alert" to IBM cloud and display in the device recent events

Code:

```
#include<WiFi.h>#include<PubSu
bClient.h>
void callback(char* subscribetopic, byte* payload, unsigned intpayloadLength);
//-------credentialsofIBMAccounts------
#defineORG"d19wub"//IBMORGANITIONID
#defineDEVICE_TYPE"ESP32"//DevicetypementionedinibmwatsonIOTPlatform
#define DEVICE_ID "3C-91-80-49-01-C9"//Device ID mentioned in ibm watson IOT
Platform#defineTOKEN"cE&QcASnabqYe18-1f"//Token
Stringdata3;
char server[] = ORG
".messaging.internetofthings.ibmcloud.com";charpublishTopic[]="iot-
2/evt/Data/fmt/json";
char subscribetopic[] = "iot-
2/cmd/test/fmt/String";charauthMethod[]="use-token-auth";
chartoken[]=TOKEN;
charclientId[]="d:"ORG":"DEVICE_TYPE":"DEVICE_ID;
WiFiClientwifiClient;
PubSubClient client(server, 1883, callback ,wifiClient);constinttrigPin=5;
const int echoPin = 18;#define
SOUND_SPEED 0.034longduration;
float
distance;voidsetup()
{
Serial.begin(115200);pinMode(tri
gPin,OUTPUT);pinMode(echoPin,
INPUT);wificonnect();mqttconnec
t();
}
voidloop()
```

```
{
digitalWrite(trigPin,
LOW);delayMicroseconds(2);digitalWrite(trigPin,
HIGH);delayMicroseconds(10);digitalWrite(trigPi
n,LOW);duration = pulseIn(echoPin,
HIGH);distance = duration *
SOUND_SPEED/2;Serial.print("Distance (cm):
");Serial.println(distance);if(distance>100)
{
Serial.println("ALERT!!");delay(100);Publi
shData(distance);delay(100);
if (!client.loop())
{mqttconnect();
}
}
delay(100);
}
void PublishData(float dist)
{mqttconnect();
String payload = "{\"Distance\":";payload+=dist;
payload += ",\"ALERT!!\":""\"Distance less than 100cms\"";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");Serial.println(server);
while(!!!client.connect(clientId,authMethod,token)){
Serial.print(".");delay(100);
}
initManagedDevice();
Serial.println();
}
}
voidwificonnect()
{
Serial.println();Serial.print("Connecting to
");WiFi.begin("Wokwi-GUEST","",6);while (WiFi.status()
 != WL_CONNECTED) {delay(100);
Serial.print(".");
}
Serial.println("");Serial.println("WiFi
connected");Serial.println("IP address:
");Serial.println(WiFi.localIP());
}
voidinitManagedDevice(){
if(client.subscribe(subscribetopic)){
```

```
Serial.println((subscribetopic));Serial.println("subscribetocmdOK");
} 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)p
ayload[i];
}
Serial.println("data: "+ data3);data3="";
}
#include<WiFi.h>#include<PubSu
bClient.h>
void callback(char* subscribetopic, byte* payload, unsigned intpayloadLength);
//------credentialsofIBMAccounts------
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LOW);delayMicroseconds(2);digitalWrite(trigPin,
HIGH);delayMicroseconds(10);digitalWrite(trigPi
n,LOW);duration = pulseIn(echoPin,
HIGH);distance = duration *
SOUND_SPEED/2;Serial.print("Distance (cm):
");Serial.println(distance);if(distance>100)
```

```
{
Serial.println("ALERT!!");delay(100);Publi
shData(distance);delay(100);
if (!client.loop())
{mqttconnect();
}
}
delay(100);
}
void PublishData(float dist)
{mqttconnect();
String payload = "{\"Distance\":";payload+=dist;
payload += ",\"ALERT!!\":""\"Distance less than 100cms\"";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");Serial.println(server);
while(!!!client.connect(clientId,authMethod,token)){
Serial.print(".");delay(100);
}
initManagedDevice();
Serial.println();
}
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voidwificonnect()
{
Serial.println();Serial.print("Connecting to
");WiFi.begin("Wokwi-GUEST","",6);while (WiFi.status()
 != WL_CONNECTED) {delay(100);
Serial.print(".");
}
Serial.println("");Serial.println("WiFi
connected");Serial.println("IP address:
");Serial.println(WiFi.localIP());
}
voidinitManagedDevice(){
if (client.subscribe(subscribetopic))
{Serial.println((subscribetopic));Serial.println("subscr
ibetocmdOK");
```
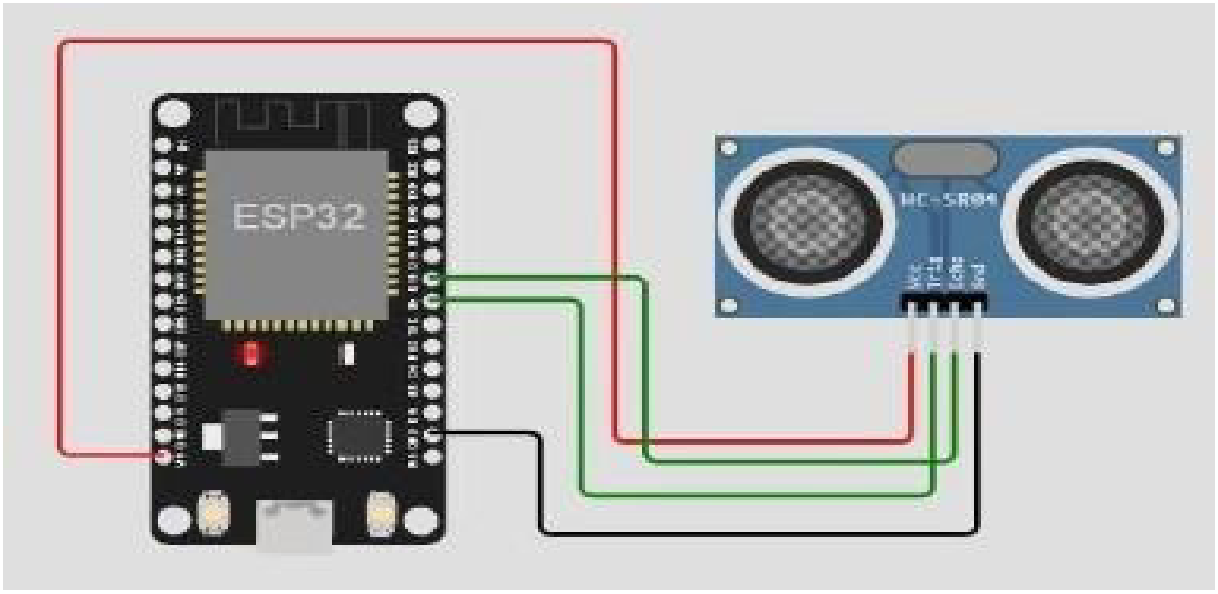

```
} else{
Serial.println("subscribetocmdFAILED");
}
}
voidcallback(char*subscribetopic,byte*payload,unsignedintpayloadLength)
{
Serial.print("callbackinvokedfortopic:");
Serial.println(subscribetopic);
for(inti=0;i<payloadLength;i++){
//Serial.print((char)payload[i]);data3+=(char)p
ayload[i];
}
Serial.println("data: "+ data3);data3="";
}
```

Diagram.json:

```
{
    "version":1,
    "author": "sweetysharon","editor":
    "wokwi","parts":[
        {"type":"wokwi-esp32-devkit-v1","id":"esp","top":-4.67,"left":-112.87,"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","ultrasonic1:VC
            C","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:

```
Connecting to ..........
WiFi connected
IP address:
10.10.0.2
Reconnecting client to d19wub.messaging.internetofthings.ibmcloud.com
iot-2/cmd/test/fmt/String
```

IBMCloudOutput: