ASSIGNMENT 4

UltrasonicsensorsimulationinWokwi

Question:

Writeacodeandconnectionsinwokwifortheultrasonicsensor.Wheneverthedistanceislessthan100cmssend an“Alert” to IBM cloudanddisplayinthedevicerecentevents.

Code:

```
#include
<WiFi.h>#include<PubSubClie
nt.h>
voidcallback(char*subscribetopic,byte*payload,unsignedintpayloadLength);
//-------credentialsofIBMAccounts------
#defineORG"kotoq5"//IBMORGANITIONID
#defineDEVICE_TYPE"ESP32"//DevicetypementionedinibmwatsonIOTPlatform#define DEVICE_ID
"12345"//Device ID mentioned in ibm watson IOT Platform#defineTOKEN"12345678"//Token
Stringdata3;
charserver[]=ORG".messaging.internetofthings.ibmcloud.com";charpublishTopic[]
="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);constint trigPin =5;
const int echoPin =
18;#defineSOUND_SPEED0.03
4longduration;
floatdistance;void
setup(){
Serial.begin(115200);pinMode(trig
Pin,OUTPUT);pinMode(echoPin,
INPUT);wificonnect();mqttconnect
();
}
voidloop()
{
digitalWrite(trigPin,
LOW);delayMicroseconds(2);digitalWrite(trig
Pin,
HIGH);delayMicroseconds(10);digitalWrite(tr
igPin,LOW);duration = pulseIn(echoPin,
HIGH);distance=duration*SOUND_SPEED/2;
Serial.print("Distance (cm):
");Serial.println(distance);if(distance<100)
{
Serial.println("ALERT!!");delay(1000)
;
```

```
PublishData(distance);dela
y(1000);
if(!client.loop()){mqttconn
ect();
}
}
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");Serial.println
(server);
while(!!!client.connect(clientId,authMethod,token)){
Serial.print(".");delay(5
00);
}
```

```
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++){
```

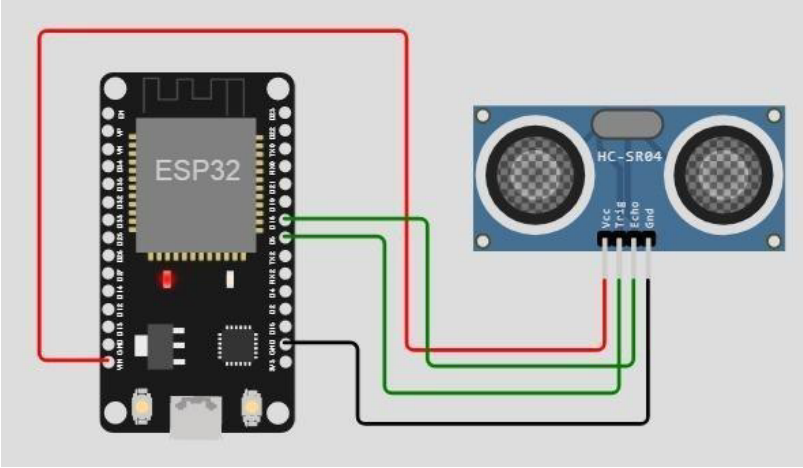
```
//Serial.print((char)payload[i]);data3+=(c
har)payload[i];
}
Serial.println("data:"+data3);data3="";
}
```

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","ultrasonic1:
      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: