ASSIGNMENT – 4

Assignment Date	22 October 2022
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Maximum Marks	2 Marks

Ultrasonic sensor simulation in Wokwi

Question:

Writeacodeandconnectionsinwokwifortheultrasonicsensor.Whenever thedistanceisle ssthan100cmssen d an“Alert” to IBM cloudanddisplayinthedevicerecentevents.

Code:

```
#include
<WiFi.h>#include<PubSu
bClient.h>
voidcallback(char*subscribetopic,byte*payload,unsignedintpayloadL
ength);
//-------credentialsofIBMAccounts------
```

```
#defineORG"kotoq5"//IBMORGANITIONID
#defineDEVICE_TYPE"ESP32"//DevicetypementionedinibmwatsonIOTPlatform#
defineDEVICE_ID "12345"//Device ID mentioned in ibmwatson IOT
Platform#defineTOKEN"12345678"//Token
Stringdata3;
charserver[]=ORG".messaging.internetofthings.ibmcloud.com";charp
ublishTopic[]="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_SPEED0.0
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(distance<100)
{
Serial.println("ALERT!!");de
lay(1000);

                PublishDat
                a(distance)
                ;
                delay(100
                0);
                if(!client.l
                oop()){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,authMetho
                d,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)pa
                    yload[i]);
                    data3+=(char)payload
                    [i];
```

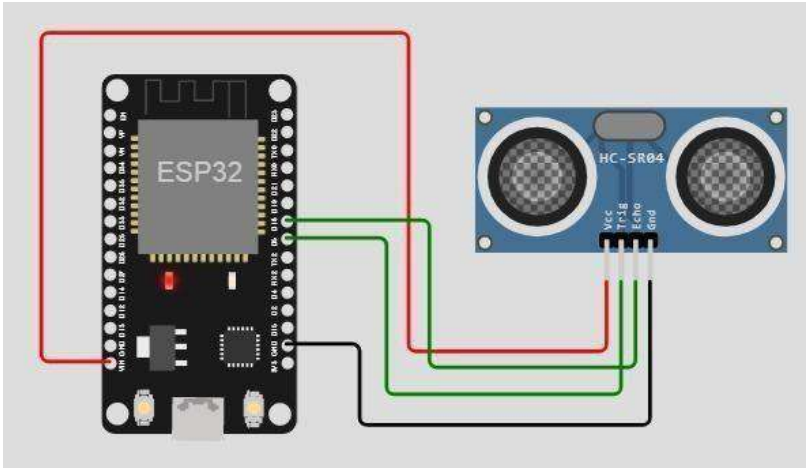
```
}
Serial.println("data:"+data3);data3="";
}
```

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: