ASSIGNMENT4

DATE	**01 November 2022**
Team ID	PNT2022TMID45862

Ultrasonic sensor simulation in Wokwi

Question:

Writeacodeandconnectionsinwokwifortheultrasonicsensor.Whenevertheditanceislessthan100cmsse n d an“Alert” to IBM cloudanddisplayinthedevicerecentevents.

Code:

```
#include
<WiFi.h>#include<PubSubC lient.h>
voidcallback(char*subscribetopic,byte*payload,unsignedintpayloadL
e ngth);
//-------credentialsofIBMAccounts------
#defineORG"kotoq5"//IBMORGANITIONID
#defineDEVICE_TYPE"ESP32"//DevicetypementionedinibmwatsonIOTPlatform#define
DEVICE_ID "12345"//Device ID mentioned in ibmwatson IOT
Platform#defineTOKEN"12345678"//Token Stringdata3;
charserver[]=ORG".messaging.internetofthings.ibmcloud.com";charpu
b lishTopic[]="iot-2/evt/Data/fmt/json";
charsubscribetopic[]="iot-
2/cmd/test/fmt/String";charauthMethod[]="use-tokenauth";
chartoken[]=TOKEN;
charclientId[]="d:"ORG":"DEVICE_TYPE":"DEVICE_ID;
WiFiClientwifiClient;
PubSubClientclient(server,1883,callback,wifiClient);constin
t trigPin =5; const int echoPin =
18;#defineSOUND_SPEED0.0
34longduration;
floatdistance;
voidsetup(){
Serial.begin(115200);pinMo
d
e(trigPin,OUTPUT);pinMode(
e choPin,
INPUT);wificonnect();mqttc
o 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="";
    }
```

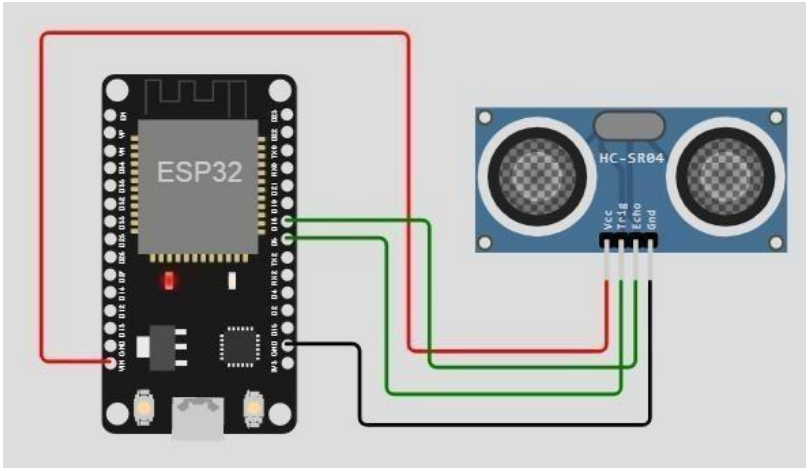
Diagram.json:

```
{
  "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:



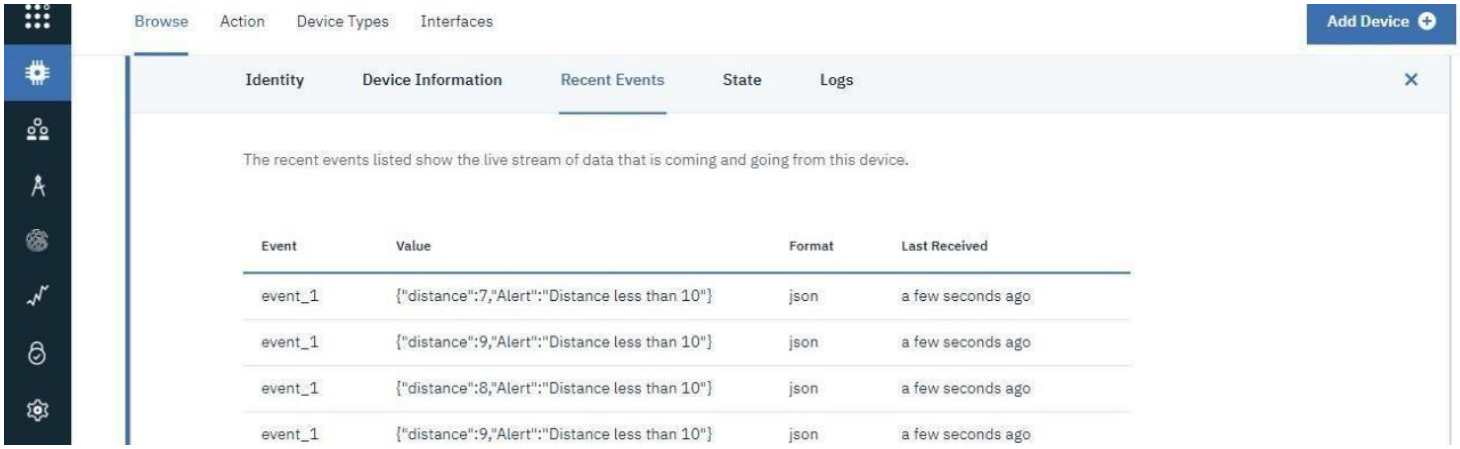
Output:

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:


Browse
Action
Device Types
Interfaces
Add Device
Identity
Device Information
Recent Events
State
Logs
The recent events listed show the live stream of data that is coming and going from this device.
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