ASSIGNMENT – 4

Assignment Date	22 October 2022
Student Name	Mr. A. Mogamath Jaleell
Student Roll Number	610819106035
Maximum Marks	2 Marks

Ultrasonic sensor simulation in Wokwi

Question:

Writeacodeandconnectionsinwokwifortheultrasonicsensor.Wheneverthedistanceisle
ssthan100cmssen d an"Alert" to IBM cloudanddisplayinthedevicerecentevents.

Code:

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

```
#define ORG "kotoq5"//IBM ORGANITION ID
#define DEVICE_TYPE "ESP32"//Device type mentioned in ibm watson IOT Platform #
define DEVICE_ID "12345"//Device ID mentioned in ibmwatson IOT
Platform #define TOKEN "12345678"//Token
String data3;
char server[]=ORG".messaging.internetofthings.ibmcloud.com";char p
ublishTopic[]="iot-2/evt/Data/fmt/json";
char subscribetopic[]="iot-
2/cmd/test/fmt/String";char authMethod[]="use-token-
auth";

char token[]=TOKEN;
char clientId[]="d:"ORG":"DEVICE_TYPE":"DEVICE_ID;
WiFiClient wifiClient;
PubSubClient client(server,1883,callback,wifiClient);const int
trigPin =5;
const int echoPin =
18;#define SOUND_SPEED 0.0
34 long duration;
float distance;
void setup(){
Serial.begin(115200);pinMod
e(trigPin,OUTPUT);pinMode(e
choPin,
INPUT);wificonnect();mqttco
nnect();
}
```

```cpp
void loop()
{
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);
                }
```

```cpp
void PublishData(float dist){mqttconnect(
);

String payload="{\"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");
}
}
void mqttconnect(){
if (!client.connected())
{Serial.print("Reconnectingclientto");Serial.println(server);
while(!!!client.connect(clientId,authMethod,token)){Serial.print(".");
delay(500);
}
initManagedDevice();
Serial.println();
}
}
void wificonnect()
{
```

```cpp
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:
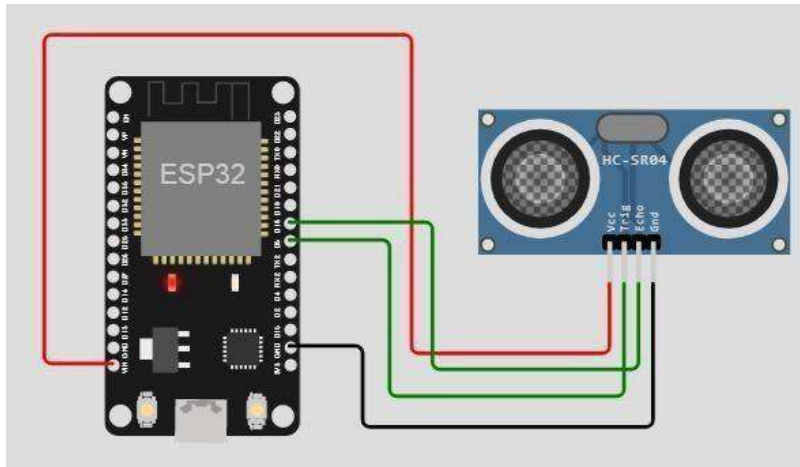
Output:
Wokwioutput:

```
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:

	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