**Assignment-4**

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| AssignmentDate | 06November2022 |
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| MaximumMarks | 2 Marks |

## Question:

Write a code and connections in wokwi for the ultrasonic sensor. Whenever the distance is less than100cmssendan “Alert” toIBM cloudanddisplay inthedevicerecentevents.

**Code:**

```
#include
<WiFi.h>#include
<PubSubClient.h>
void callback(char* subscribetopic, byte* payload, unsigned int
payloadLength);
//-------credentialsofIBMAccounts------
#defineORG"kotoq5"//IBMORGANITIONID
#define DEVICE_TYPE "ESP32"//Device type mentioned in ibm watson IOT
Platform#define DEVICE_ID "12345"//Device ID mentioned in ibm watson IOT
Platform#defineTOKEN"12345678"//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;#defineSOUND_SPEED
0.034 long
duration;float
distance;voidsetup()
{Serial.begin(115200)
;
pinMode(trigPin,
OUTPUT);pinMode(echoPin,
INPUT);wificonnect();mqtt
connect();
}
voidloop()
{
digitalWrite(trigPin,
LOW);delayMicroseconds(2);digitalW
rite(trigPin,
HIGH);delayMicroseconds(10);digita
lWrite(trigPin, LOW);duration =
pulseIn(echoPin, HIGH);distance =
duration *SOUND_SPEED/2;
Serial.print("Distance (cm):
");Serial.println(distance);if(d
istance<100)
{
Serial.println("ALERT!!");
delay(1000);
```

```
PublishData(distance)
;delay(1000);
if (!client.loop())
{mqttconnect();
}
}
delay(1000);
}
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("Reconnecting client
to");Serial.println(server);
while(!!!client.connect(clientId,authMethod,token)){
Serial.print(".")
;delay(500);
}
```

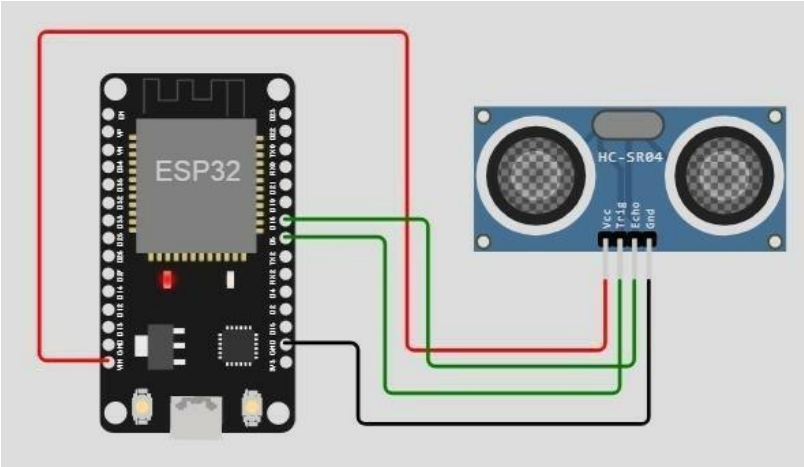
```
initManagedDevice();
Serial.println();
}
}
voidwificonnect()
{
Serial.println(); Serial.print("Connecting to
");WiFi.begin("Wokwi-GUEST", "", 6); while (WiFi.status()
!=WL_CONNECTED){delay(500);
Serial.print(".");
}
Serial.println("");
Serial.println("WiFiconnected");
Serial.println("IP address:
");Serial.println(WiFi.localIP());
}
voidinitManagedDevice(){
if (client.subscribe(subscribetopic))
{Serial.println((subscribetopic));
Serial.println("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)payload[i];
      }
      Serial.println("data: "+
      data3);data3="";
      }
```

**Diagram.json:**

```
{
  "version":1,
  "author":
  "Smart","editor":"wokwi",
  "parts":[
    {"type":"wokwi-esp32-devkit-v1","id":"esp","top":10.67,"left":-133.33,"attrs":{}},
    {"type":"wokwi-hc-sr04","id":"ultrasonic1","top":-31.37,"left":45.17,"attrs":{}}
  ],
  "connections":[
    ["esp:TX0","$serialMonitor:RX","",[]],
    [ "esp:RX0", "$serialMonitor:TX", "", []
    ],[
      "ultrasonic1:VCC",
      "esp:VIN",
      "red",
      ["v93.91","h-100.45","v-168","h-186","v181.33","h-6.67"]
    ],
    ["ultrasonic1:TRIG","esp:D5","green",["v42.57","h-158.34"]],
    ["ultrasonic1:ECHO","esp:D18","green",["v116.57","h-80.23","v0"]],
    ["ultrasonic1:GND","esp:GND.1","black",["v141.91","h-133.45","v-38.67"]]
  ]
}
```

CrcuitDiagram:




**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:**