

ASSIGNMENT-4

G.YOGESHWARAN
421319106043(batch9)
Smartwastemanagementformetropolitancities

Question:

Write code and connections in wokwi for ultrasonic sensor. Whenever distance is less than 100 centimeters it should send "alert" to IBM cloud and display in device recent events

Code:

```
#include<WiFi.h>
#include
<PubSubClient.h>#includ
e<ArduinoJson.h>
WiFiClient

wifiClient;#defineOR

G"9tg03j"

#defineDEVICE_TYPE"RaspberryPi"#define
DEVICE_ID"12345"
#defineTOKEN"12345678"
#define speed0.034

charserver[]="ORG".messaging.internetofthings.ibmcloud.com";charp
ublishTopic[]="iot-2/evt/status1/fmt/json";
chartopic[]="iot-
2/cmd/home/fmt/String";charauthMethod[]="
use-token-auth";
chartoken[]=TOKEN;
charclientId[]="d:"ORG":DEVICE_TYPE":DEVICE_ID;

PubSubClientclient(server,1883,wifiClient);vo
idpublishData();

constinttrigpin=5;
constintechopin=19;St
ring
command;Stringdata=
"";String
```

```

name="Alert";Stringic
on="";
long
duration;intdi
st;
voidsetup()
{
  Serial.begin(115200);pinMo
  de(trigpin,
  OUTPUT);pinMode(echopin
  ,
  INPUT);wifiConnect();mqtt
  Connect();
}
void loop()
{publishData(
);delay(500);
if(!client.loop()){
  mqttConnect();
}
}

void wifiConnect()
{Serial.print("Connecting to
");Serial.print("Wifi");WiFi.begin("
Wokwi-GUEST","",6);
while(WiFi.status()!=WL_CONNECTED){delay(500);
  Serial.print(".");
}
Serial.print("WiFiconnected,IPaddress:");Serial.println(WiFi.localIP());
}
voidmqttConnect(){
  if(!client.connected()){
    Serial.print("ReconnectingMQTTclientto");Serial.println(server);whi
    le (!client.connect(clientId, authMethod, token)) {Serial.print(".");
    Serial.print("*");
    delay(1000);
  }
  initManagedDevice();Se
  rial.println();
}
}

voidinitManagedDevice(){
if (client.subscribe(topic))
{Serial.println(client.subscribe(topic));Serial.pr
intln("subscribetocmdOK");
}
}

```

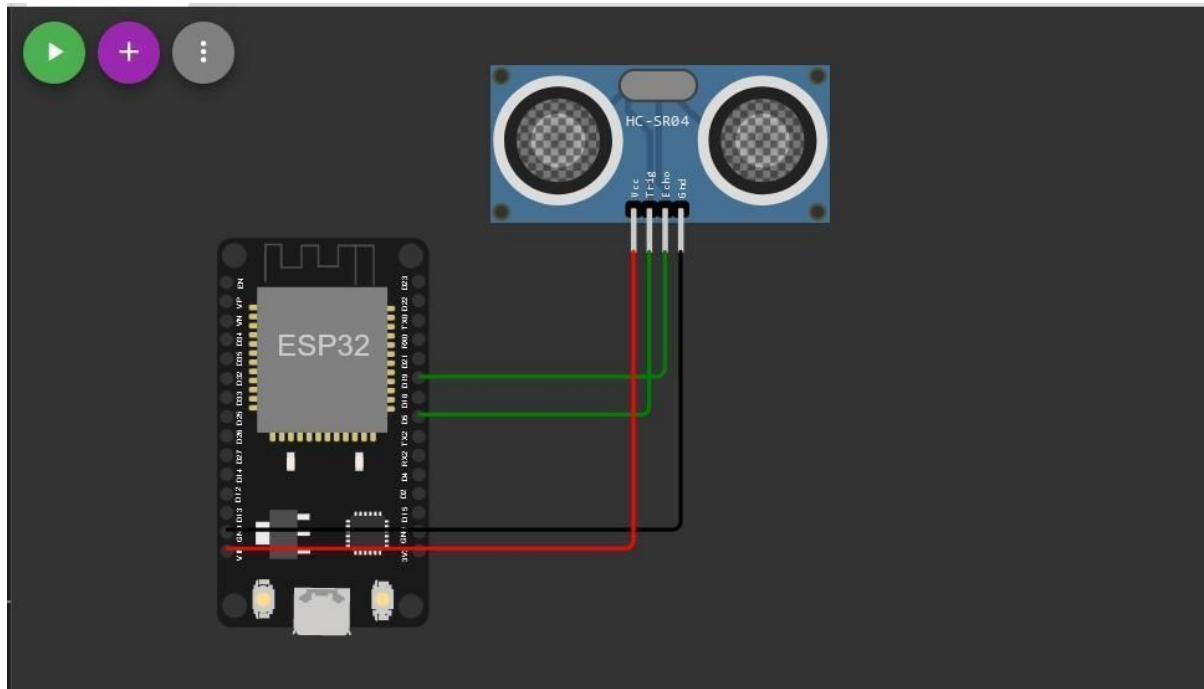
```

else{
    Serial.println("subscribetocmdFAILED");
}
}

voidpublishData()
{
    digitalWrite(trigpin,LOW);digital
    Write(trigpin,HIGH);delayMicrose
    conds(10);digitalWrite(trigpin,LO
    W);duration=pulseIn(echopin,HIG
    H);dist=duration*speed/2;if(dist<1
    00){
        dist=100-
        dist;icon="Not-
        Crashed";
    }
    else{ dis
        t=0;
        icon="Crashed";
    }
    DynamicJsonDocument
    doc(1024);String
    payload;doc["Name"]=name;doc["I
    mpact"]=icon;doc["Distance"]=dist
    ;serializeJson(doc,
    payload);delay(3000);
    Serial.print("\n");Serial.print("Sendi
    ngpayload:");Serial.println(payload);
    if(client.publish(publishTopic,(char*)payload.c_str())){ Serial.println
        ("PublishOK");
    }
    else{
        Serial.println("PublishFAILED");
    }
}

```

DIAGRAM:



OUTPUT:

The screenshot displays the Arduino IDE interface with the code for the ESP32 project. The code is as follows:

```
esp32-blink.ino  diagram.json  libraries.txt  Library Manager  Docs
SAVE  SHARE  esp32-arduino.ino copy

34 Serial.begin(115200);
35 pinMode(trigpin, OUTPUT);
36 pinMode(echopin, INPUT);
37 wifiConnect();
38 mqttConnect();
39 }
40
41 void loop() {
42   publishData();
43   delay(500);
44   if (!client.loop()) {
45     mqttConnect();
46   }
47 }
48
49 void wifiConnect() {
50   Serial.print("Connecting to "); Serial.print("wifi");
51   WiFi.begin("Wokwi-GUEST", "", 6);
52   while (WiFi.status() != WL_CONNECTED) {
53     delay(500);
54     Serial.print(".");
55   }
56   Serial.print("WiFi connected, IP address: "); Serial.println(WiFi.localIP());
57 }
58
59 void mqttConnect() {
60   if (!client.connected()) {
61     Serial.print("Reconnecting MQTT client to "); Serial.println(server);
62     while (!client.connect(clientId, authMethod, token)) {
63       Serial.print(".");
64       Serial.print("a");
65       delay(1000);
66     }
67   }
68   initManagedDevice();
69 }
```

The simulation window on the right shows the same hardware diagram as the previous image, with the ESP32 and HC-SR04 sensor connected. The simulation control bar at the top left of the window includes a play button, an add button, and a menu button.

Add Device

ID	Name	Type	Status	Last Seen	Location
12345	Rasp	Device	Connected	Oct 14, 2022 9:55 AM	

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
status1	{"Name":"Alert","Icon":"trash","FillPercent":0}	json	a few seconds ago
status1	{"Name":"Alert","Icon":"trash","FillPercent":0}	json	a few seconds ago
status1	{"Name":"Alert","Icon":"trash","FillPercent":0}	json	a few seconds ago
status1	{"Name":"Alert","Icon":"trash","FillPercent":0}	json	a few seconds ago

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