

Assignment-4

Date	25 November 2022
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ProjectName	IoT Based Smart Crop Protection System forAgriculture

Question:

Write code and connections in wokwi for ultrasonic sensors. That whenever distance is less than 100cmssend"alert"toibmcloudanddisplay indevicerecentevents.

Uploadadocumentwithwokwishare linkandimages.

Wokwi:

<https://wokwi.com/projects/347957641491776082>

Code:

```
#include<WiFi.h>#include<
PubSubClient.h>

WiFiClientwificlient;

#define ORG
"tw9ckq"#define
DEVICE_TYPE
"jade"#defineDEVICE_ID"701
0"
#defineTOKEN"9944893843"
#define speed0.034

char server[] =
ORG".messaging.internetofthings.ibmcloud.com";charpublishTopic
[]= "iot-2/evt/status1/fmt/json";
char topic[] = "iot-
2/cmd/home/fmt/String";charauthMethod[]="us
e-token-auth";
char token[]=TOKEN;
charclientId[]="d:ORG": "DEVICE_TYPE": "DEVICE_ID;
PubSubClient client(server, 1883,
wificlient);void publishData();
const int
trigpin=5;const int
echopin=18;Stringcomm
and;Stringdata="";
long
duration;float
dist;
```

```
void setup()  
{  
    Serial.begin(115200);pinM  
ode(trigpin,  
OUTPUT);pinMode(echopin,I  
NPUT);
```

```

        wifiConnect();
        mqttConnect();
    }
    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());
    }
    void mqttConnect(){
        if (!client.connected())
            {Serial.print("Reconnecting MQTT client to ");Serial.println(server);
            while(!client.connect(clientId,authMethod,token)){
                Serial.print(".");
                delay(500);
            }
            initManagedDevice();
            Serial.println();
        }
    }
    void initManagedDevice(){
        if(client.subscribe(topic)){
            Serial.println("subscribetocmdOK");
        }
        else{
            Serial.println("subscribetocmdFAILED");
        }
    }
    void publishData()
    {
        digitalWrite(trigpin,LOW);digitalWrite(trigpin,HIGH);delayMicroseconds(10);digitalWrite(trigpin,LOW);duration=pulseIn(echopin,HIGH);dist=duration*speed/2;if(dist<100){
            String payload = "{\"Alert distance\":";payload+=dist;
            payload+="}";
            Serial.print("\n");
        }
    }

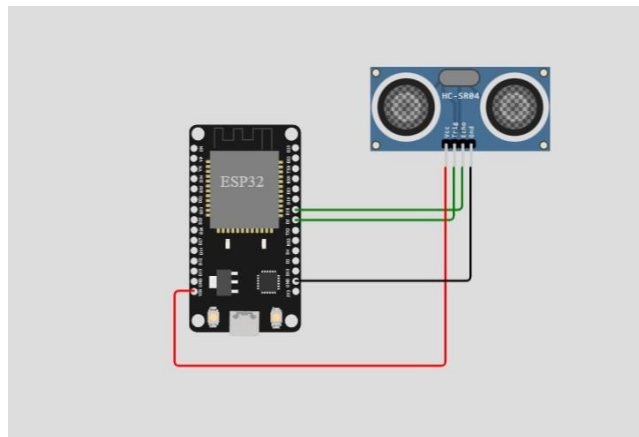
```

```

Serial.print("Sendingpayload:");
Serial.println(payload);
if(client.publish(publishTopic,(char*)payload.c_str())){
    Serial.println("PublishOK");
}
else{
    Serial.println("PublishFAILED");
}
}
}
}

```

Diagram:



WokwiOutput:

```

1 #include <WiFi.h>
2 #include <PubSubClient.h>
3
4 WiFiClient wifiClient;
5
6 #define ORG "tw9ckq"
7 #define DEVICE_TYPE "jade"
8 #define DEVICE_ID "7818"
9 #define TOKEN "9944899843"
10 #define speed 0.034
11
12 char server[] = ORG".messaging.internetofthings.ibmcloud.com";
13 char publishTopic[] = "iot-2/evt/status1/fmt/json";
14 char topic[] = "iot-2/cmd/home/fmt/String";
15 char authMethod[] = "use-token-auth";
16 char token[] = TOKEN;
17 char clientId[] = "i:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;
18 PubSubClient client(server, 1883, wifiClient);
19 void publishData();
20 const int trigPin=5;
21 const int echoPin=4;
22 String command;
23 String data="";
24 long duration;
25 float dist;
26 void setup()
27 {
28   Serial.begin(115200);
29   pinMode(trigPin, OUTPUT);
30   pinMode(echoPin, INPUT);
31   wifiConnect();
32   mqttConnect();
33 }
34 void loop() {
35   publishData();
36   delay(500);
37   if (!client.loop()) {
38     mqttConnect();

```

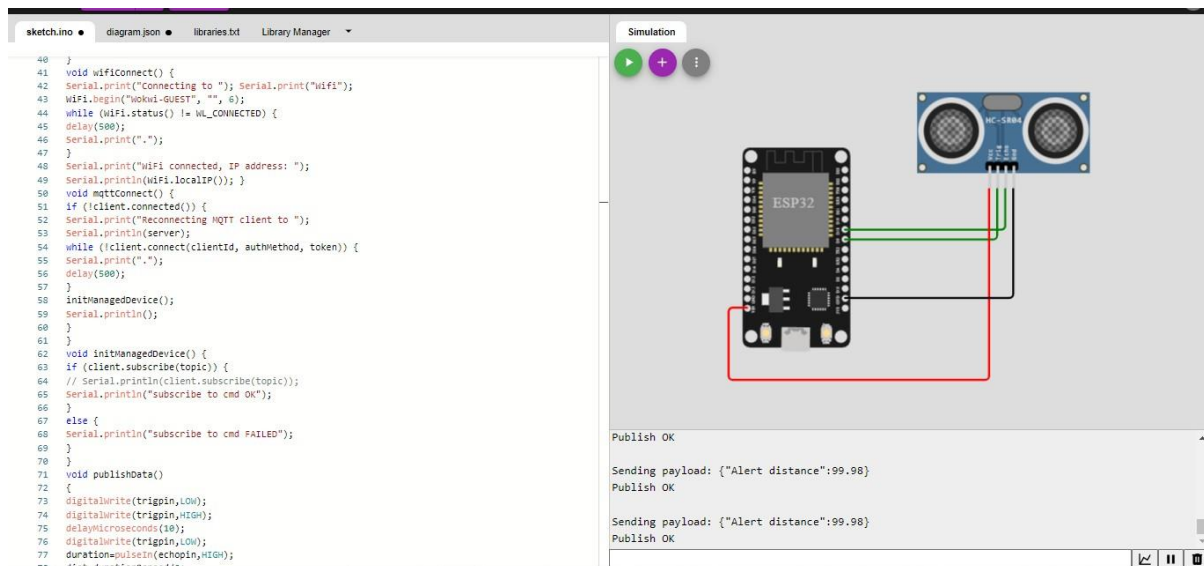
Simulation

```

Connecting to Wifi..Wifi connected, IP address: 10.10.0.2
Reconnecting MQTT client to tw9ckq.messaging.internetofthings.ibmcloud.com
subscribe to cmd OK

Sending payload: {"Alert distance":99.94}
Publish OK

```



IBMcloudoutput:

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	{"Alert distance":99.98}	json	a few seconds ago	
status1	{"Alert distance":99.98}	json	a few seconds ago	
status1	{"Alert distance":99.98}	json	a few seconds ago	
status1	{"Alert distance":99.98}	json	a few seconds ago	
status1	{"Alert distance":99.98}	json	a few seconds ago	

>

esp32ass

Disconnected

ESP32

Device

Nov 9, 2022 9:58 PM

0 Simulations running