

ASSIGNMENT- 4

Assignment Date	27 OCT 2022
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Project Title	IoT Based Smart Crop Protection System for Agriculture
Maximum Marks	2 Marks

Question:

Write code and connections in wokwi for the ultrasonic sensor. Whenever the distance is less than 100 cms send an "alert" to the IBM cloud and display in the device recent events. Upload document with wokwi share link and images of IBM cloud.

```
#include <WiFi.h>
#include <PubSubClient.h>
WiFiClient wifiClient;
String data3;
#define ORG "j3bvs8"
#define DEVICE_TYPE "Soundharya"
#define DEVICE_ID "Soundharya123"
#define TOKEN "123456789"
#define speed 0.034
#define led 14
char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
char publishTopic[] = "iot-2/evt/Soundharya/fmt/json";
char topic[] = "iot-2/cmd/home/fmt/String";
char authMethod[] = "use-token-auth";
char token[] = TOKEN;
char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;
PubSubClient client(server, 1883, wifiClient);
void publishData();

const int trigpin=5;
const int echopin=18;
String command;
String data="";

long duration;
float dist;
```

```

void setup()

{
    Serial.begin(115200);
    pinMode(led, OUTPUT);
    pinMode(trigpin, OUTPUT);
    pinMode(echopin, INPUT);
    wifiConnect();
    mqttConnect();
}

void loop() {
    bool isNearby = dist < 100;
    digitalWrite(led, isNearby);

    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("WiFi connected, IP address: "); 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(client.subscribe(topic));
        Serial.println("IBM subscribe to cmd OK");
    } else {
        Serial.println("subscribe to cmd FAILED");
    }
}
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("Sending payload: ");
        Serial.println(payload);
        if(client.publish(publishTopic, (char*) payload.c_str())) {
            Serial.println("Warning crosses 110cm -- it automatically of the loop");
            digitalWrite(led,HIGH);
        }
    }

    if(dist>101 && dist<111){
        String payload = "{\"Normal Distance\":\"";
        payload += dist;
        payload += "\"}";

        Serial.print("\n");
        Serial.print("Sending payload: ");
        Serial.println(payload);
    }
}

void callback(char* subscribeTopic, byte* payload, unsigned int
payloadLength){
    Serial.print("callback invoked for topic:");
    Serial.println(subscribeTopic);
    for(int i=0; i<payloadLength; i++){
        dist += (char)payload[i];
    }
}

```

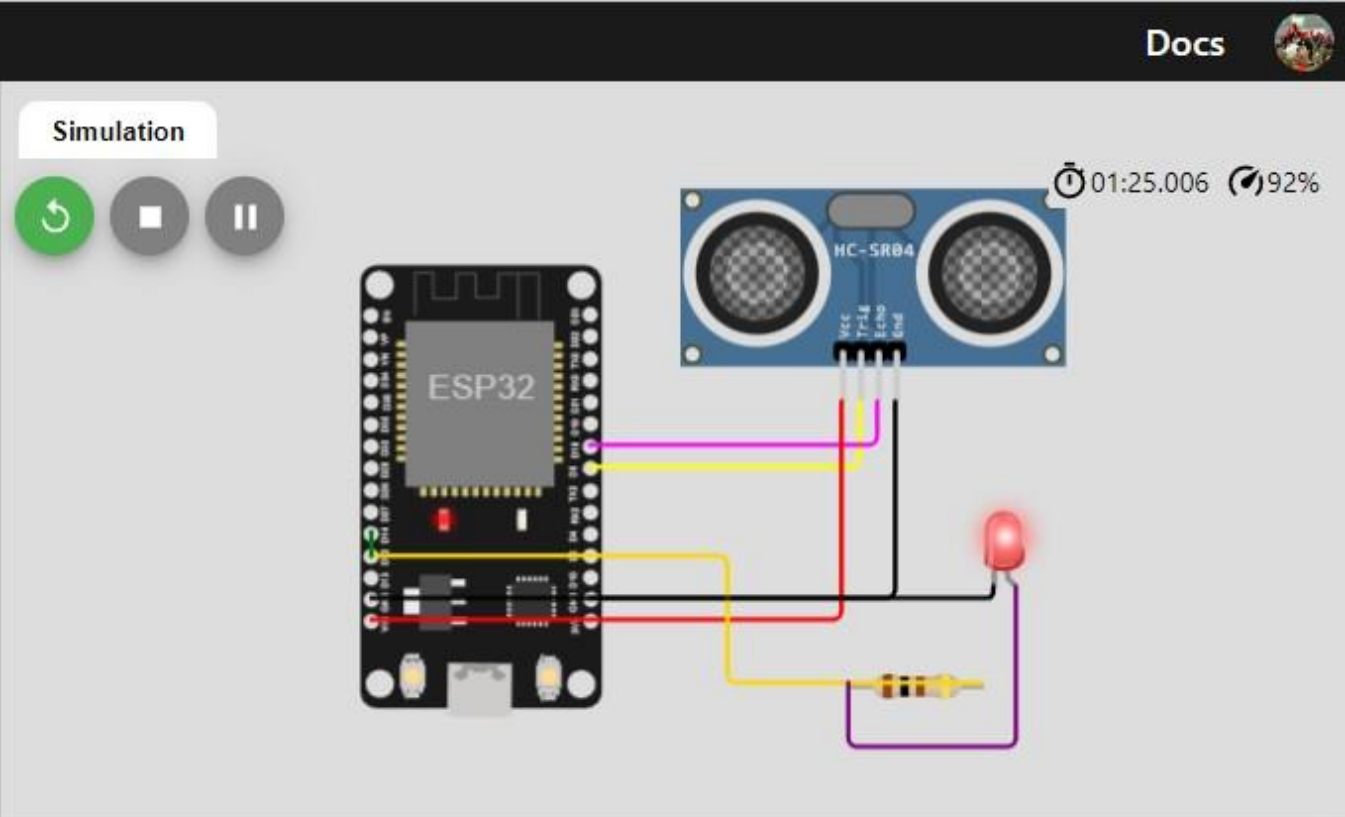
```

Serial.println("data:" + data3);

if(data3=="lighton"){
    Serial.println(data3);
    digitalWrite(led,HIGH);
}
data3="";
}

```

OUTPUT:



Simulation

01:25.006 92%

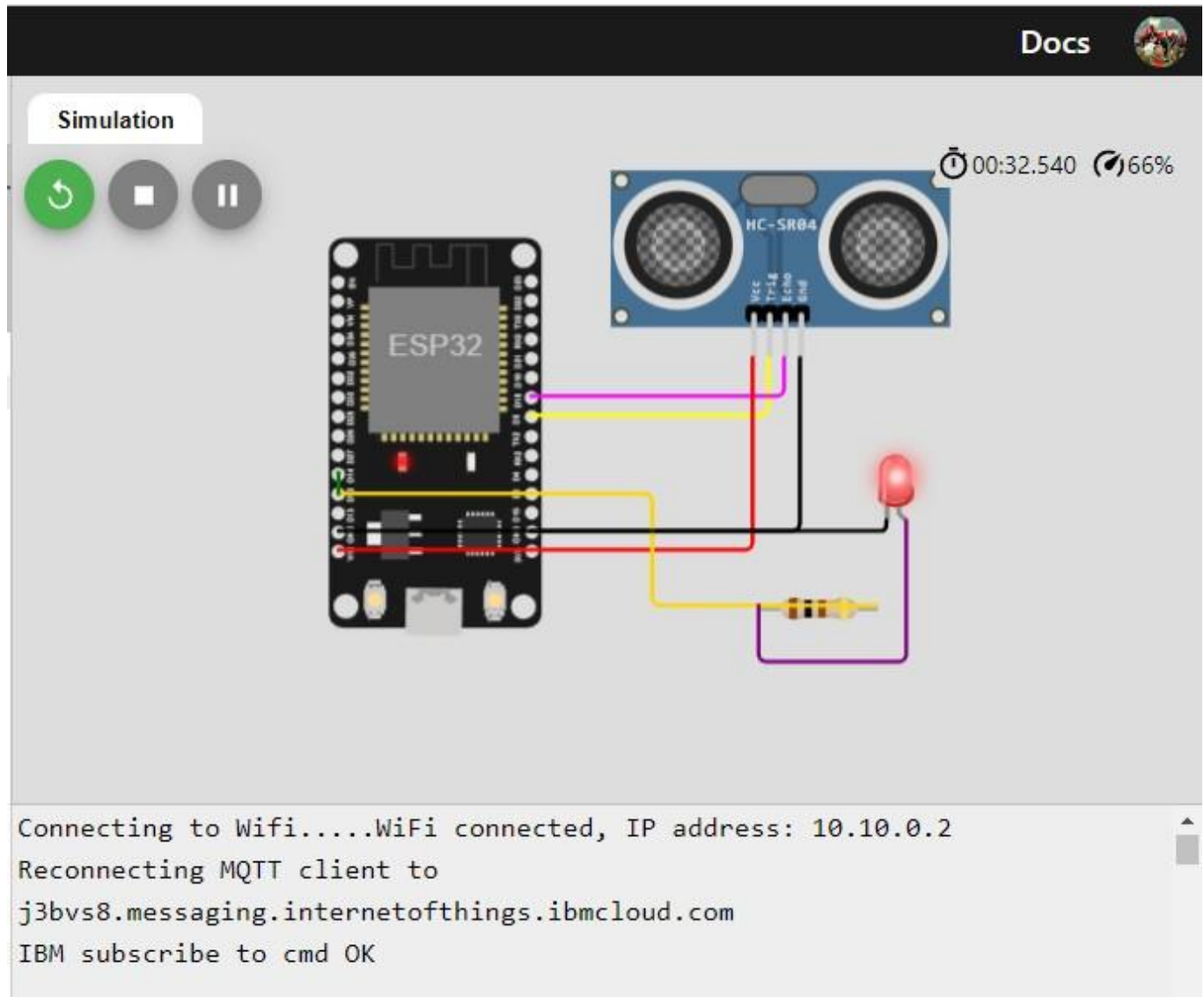
Sending payload: {"Alert Distance":89.96}
Warning crosses 110cm -- it automaticaly of the loop

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Activate Windows
Go to Settings to activate Windows.

When the distance is less than 100cm alertmessage will appear in the IBM cloud.



While Distance is greater than 100cm there is no alert message in the IBM cloud.

<input type="checkbox"/>	Device ID	Status	
▼ <input type="checkbox"/>	Soundharya123	● Connected	S
Identity		Device Information	Recent Events
Device ID		Soundharya123	
Device Type		Soundharya	
Date Added		Nov 6, 2022 12:19 AM	
Added By		soundaryaeece2019@gmail.com	
Connection Status		Connected Connection Time: Nov 6, 2022 12:26 AM Client Address: 216.246.119.62 Insecure	

IBM CLOUD OUTPUT:

Device ID

Status

Device Type

Class ID

▼

Soundharya123

Connected

Soundharya

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

Soundharya

{"Alert Distance":89.96}

json

a few seconds ago

Soundharya

{"Alert Distance":89.98}

json

a few seconds ago

Soundharya

{"Alert Distance":89.98}

json

a minute ago

WOKWI URL:

<https://wokwi.com/projects/347561769078620756>