

Assignment -4
Wokwi & IBM Cloud

Assignment Date	28 October 2022
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Maximum Marks	2 Marks

Question-1:

Write code and connections in wokwi for ultrasonic sensor. Whenever the distance is less than 100 cms sent "alert" to ibm cloud and display in device recent events.

Solution:

Code:

```
#include <WiFi.h>
#include <PubSubClient.h>
WiFiClient wifiClient;
String data3;
#define ORG "jqjdz3"
#define DEVICE_TYPE "childsafety01"
#define DEVICE_ID "Device01"
#define TOKEN "12345678"
#define speed 0.034
#define led 14
char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
char publishTopic[] = "iot-2/evt/manimd/fmt/json";
char topic[] = "iot-2/cmd/led/fmt/String";
char authMethod[] = "use-token-auth";
char token[] = TOKEN;
char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;
PubSubClient client(server, 1883, wifiClient);

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("Publish OK");
    }
}

if(dist>100){
    String payload = "{\"Distance\":\"";
    payload += dist;
    payload += "\"}";

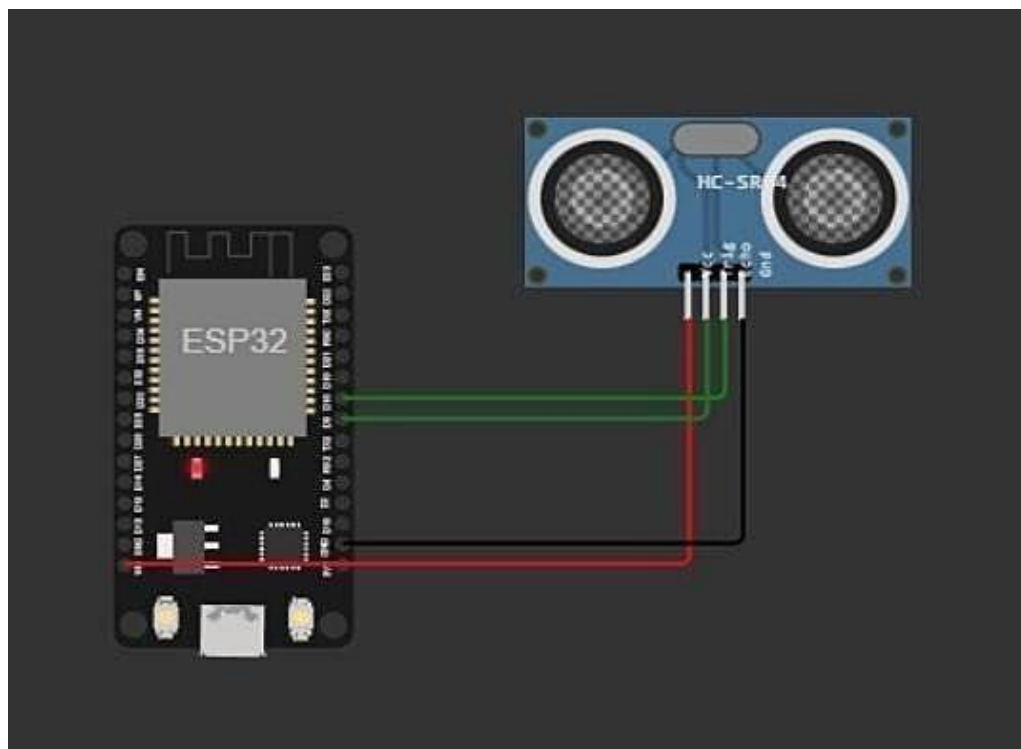
    Serial.print("\n");
    Serial.print("Sending payload: ");
    Serial.println(payload);
    if(client.publish(publishTopic, (char*) payload.c_str())) {
        Serial.println("Publish OK");
    }else {
        Serial.println("Publish FAILED");
    }
}

}

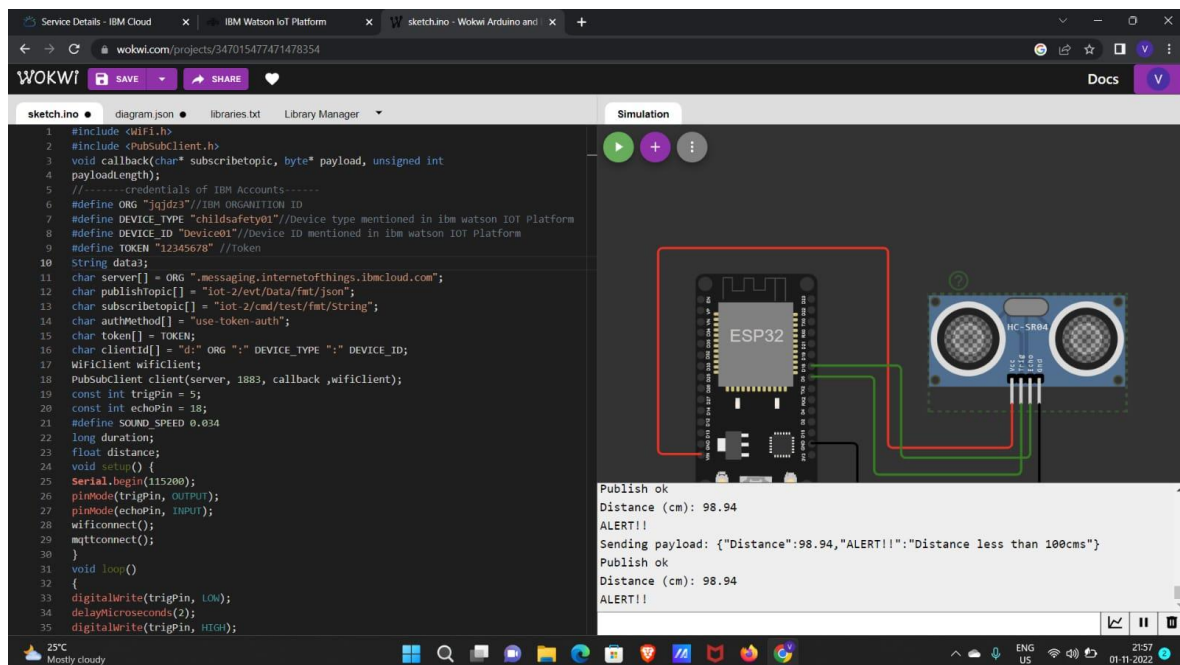
}

```

Connections:



Output:(wokwi):



```
1 #include <WiFi.h>
2 #include <PubSubClient.h>
3 void callback(char* topic, byte* payload, unsigned int
4   payloadLength);
5 //-----credentials of IBM Accounts-----
6 #define ORG "jqjd23"//IBM ORGANIZATION ID
7 #define DEVICE_TYPE "childsafety01"//Device type mentioned in ibm watson IOT Platform
8 #define DEVICE_ID "Device01"//Device ID mentioned in ibm watson IOT Platform
9 #define TOKEN "12345678" //Token
10 String data;
11 char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
12 char publishTopic[] = "iot-2/evt/Data/fmt/json";
13 char subscribeTopic[] = "iot-2/cmd/test/fmt/String";
14 char authMethod[] = "use-token-auth";
15 char token[] = TOKEN;
16 char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;
17 WiFiClient wificlient;
18 PubSubClient client(server, 1883, callback ,wificlient);
19 const int trigPin = 5;
20 const int echoPin = 18;
21 #define SOUND_SPEED 0.034
22 long duration;
23 float distance;
24 void setup() {
25   Serial.begin(115200);
26   pinMode(trigPin, OUTPUT);
27   pinMode(echoPin, INPUT);
28   wificlient();
29   mqttconnect();
30 }
31 void loop() {
32   digitalWrite(trigPin, LOW);
33   delayMicroseconds(2);
34   digitalWrite(trigPin, HIGH);
```

Publish ok
Distance (cm): 98.94
ALERT!!
Sending payload: {"Distance":98.94,"ALERT!!":"Distance less than 100cms"}
Publish ok
Distance (cm): 98.94
ALERT!!

Link: <https://wokwi.com/projects/347142976702513746>

Output:(IBM Cloud)

Service Details - IBM Cloud

IBM Watson IoT Platform

sketchino - Wokwi Arduino and

jjjdz3.internetofthings.ibmcloud.com/dashboard/devices/browse

akshayapriya.19cs001@nandhaengg.org
ID: jjjdz3

IBM Watson IoT Platform

Browse

Action

Device Types

Interfaces

Add Device

Search by Device ID

Device Simulator

Device ID	Status	Device Type	Class ID	Date Added	Descriptive Location
Device01	Connected	childsafety01	Device	Nov 1, 2022 9:48 PM	

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
Data	{"Distance":98.94,"ALERT!!":"Distance less than ...	json	a few seconds ago
Data	{"Distance":98.94,"ALERT!!":"Distance less than ...	json	a few seconds ago
Data	{"Distance":98.94,"ALERT!!":"Distance less than ...	json	a few seconds ago
Data	{"Distance":98.94,"ALERT!!":"Distance less than ...	json	a few seconds ago
Data	{"Distance":98.94,"ALERT!!":"Distance less than ...	json	a few seconds ago

25°C
Mostly cloudyENG
US21:57
01-11-2022