

Assignment-4

Date	28 October 2022
Team ID	PNT2022TMID23797
Project Name	Real time river water quality monitoring and Control System
Maximum Marks	4 Marks

Question:

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

CODE:

```
#include <WiFi.h> //library for wifi
#include <PubSubClient.h> //library for MQTT

#define ECHO_GPIO 12
#define TRIGGER_GPIO 14
#define MAX_DISTANCE_CM 100 // Maximum of 5 meters
#include "Ultrasonic.h"
Ultrasonic ultrasonic(14, 12);
int distance;
void callback(char* subscribetopic, byte* payload, unsigned
int payloadLength);

//-----credentials of IBM Accounts-----

#define ORG "q6sux6" //IBM ORGANITION ID
#define DEVICE_TYPE "ESP32" //Device type mentioned in ibm watson IOT Platform
#define DEVICE_ID "BADMAPRIYA1827" //Device ID mentioned in ibm watson IOT
Platform
#define TOKEN "gp5PA9!jfw7jf9cV-g"
//Token String data3; float h, t;

//----- Customise the above values -----
char server[] = ORG ".messaging.internetofthings.ibmcloud.com"; // Server
Name char publishTopic[] = "iot-2/evt/Data/fmt/json"; // topic name and type
of event perform and format in which data to be send char subscribetopic[] =
"iot-2/cmd/command/fmt/String"; // cmd REPRESENT command type AND COMMAND IS
TEST OF FORMAT STRING
char authMethod[] = "use-token-auth"; // authentication method char
token[] = TOKEN; char clientId[] = "d:" ORG ":" DEVICE_TYPE ":"
DEVICE_ID; //client id
```

```

//-----
WiFiClient wifiClient; // creating the instance for wificlient
PubSubClient client(server, 1883, callback ,wifiClient); //calling the
predefined client id by passing parameter like server id,portand
wificredential
void setup()// configureing the
ESP32
{
    Serial.begin(115200);
    delay(10);
    Serial.println();
    wificonnect();
    mqttconnect();
} void loop()// Recursive
Function
{
    distance =
    ultrasonic.read(CM);
    if(distance < 100){
        Serial.print("Distance in CM: ");

        Serial.println(distance);
        PublishData(distance);
        delay(1000);
        if
        (!client.loop()) {
            mqttconnect();
        }
    }
    delay(1000);
}

/*.....retrieving to
Cloud.....*/
void PublishData(float temp) {
    mqttconnect();//function call for connecting to ibm
    /*
        creating the String in in form JSON to update the data to ibm cloud
    */
    String payload = "{\\"Alert
    Distance:\":\"";
    payload += temp;
    payload += "}";
}

```

```

Serial.print("Sending payload: ");
Serial.println(payload);

if (client.publish(publishTopic, (char*) payload.c_str())) {
    Serial.println("Publish ok");// if it successfully upload data on the cloud
    then it will print publish ok in Serial monitor or else it will print publish
    failed
} else {
    Serial.println("Publish failed");
}

} void
mqttconnect() {
    if (!client.connected()) {
        Serial.print("Reconnecting client to ");
        Serial.println(server);
        while (!client.connect(clientId, authMethod, token))
        {
            Serial.print(".");    delay(500);
        }
        initManagedDevice();
        Serial.println();
    } } void wificonnect() //function definition for
wificonnect {
    Serial.println();
    Serial.print("Connecting to ");

    WiFi.begin("Wokwi-GUEST", "", 6);//passing the wifi credentials to establish
the connection
    while (WiFi.status() != WL_CONNECTED) {
        delay(500);
        Serial.print(".");
    }
    Serial.println("");
    Serial.println("WiFi connected");
    Serial.println("IP address: ");
    Serial.println(WiFi.localIP());
} void
initManagedDevice() {
    if (client.subscribe(subscribetopic)) {
        Serial.println((subscribetopic));
        Serial.println("subscribe to cmd OK");
    }
}

```

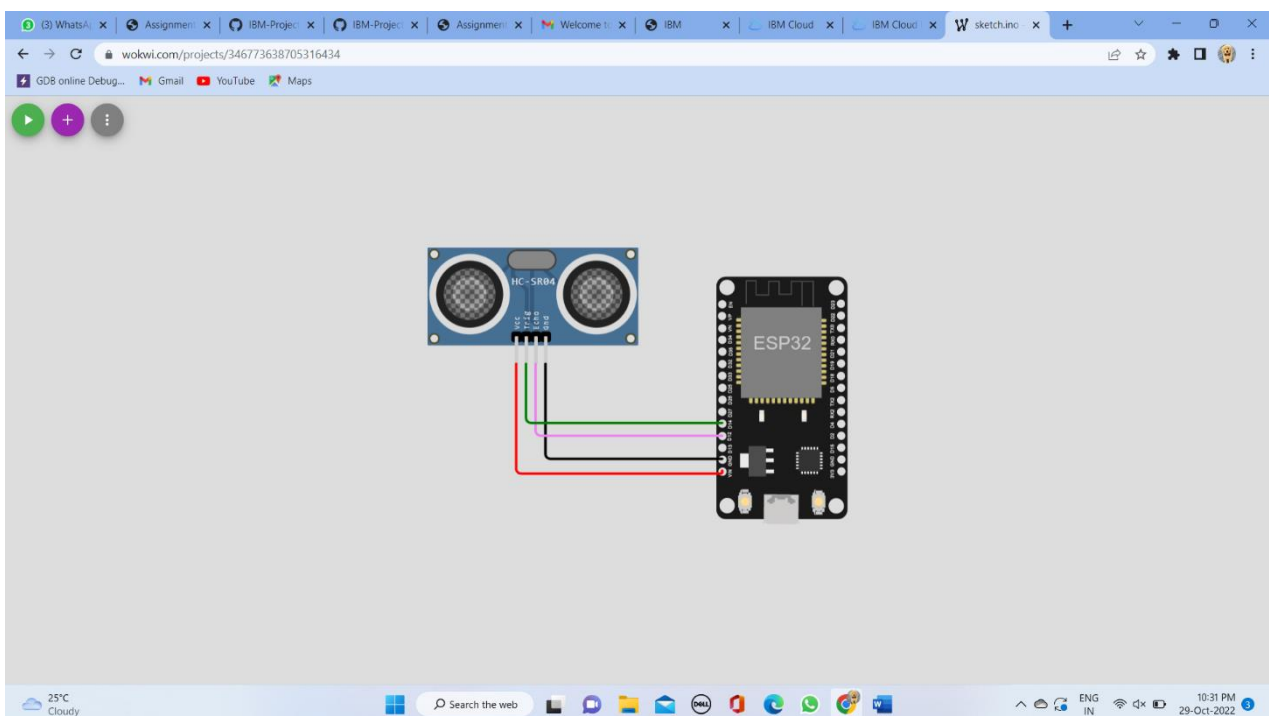
```

    } else {
        Serial.println("subscribe to cmd FAILED");
    }
} void callback(char* subscribetopic, byte* payload, unsigned int
payloadLength)
{

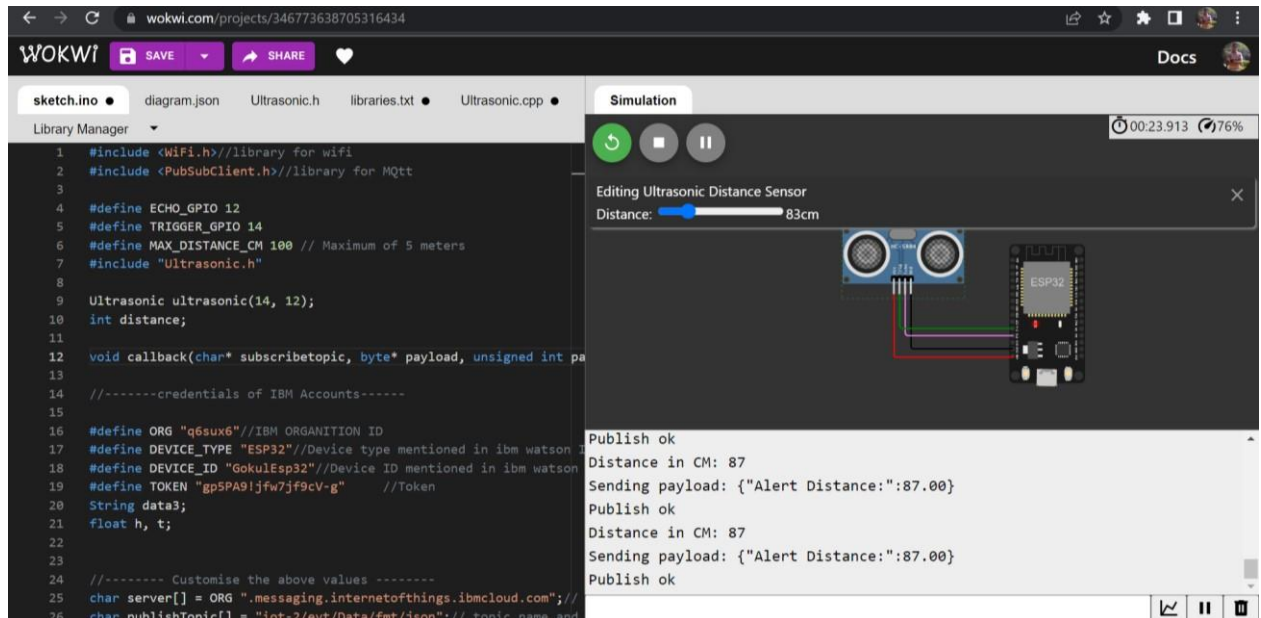
    Serial.print("callback invoked for topic: ");
    Serial.println(subscribetopic);    for (int i =
0; i < payloadLength; i++) {        data3 +=
(char)payload[i];
    }
    Serial.println("data: "+ data3);
    if(data3=="lighton")    {
        Serial.println(data3);
    }
    else
    {
        Serial.println(data3);
    }
    data3="";
}

```

CIRCUIT DIAGRAM:



OUTPUT:



Browse Action Device Types Interfaces Add 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	
Data	{"Alert Distance:":87}	json	a few seconds ago	
Data	{"Alert Distance:":87}	json	a few seconds ago	
Data	{"Alert Distance:":87}	json	a few seconds ago	
Data	{"Alert Distance:":90}	json	a few seconds ago	
Data	{"Alert Distance:":68}	json	a few seconds ago	

Project Link:

<https://wokwi.com/projects/346773638705316434>