

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 "Devadharshinim11" //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");
    }
}

```

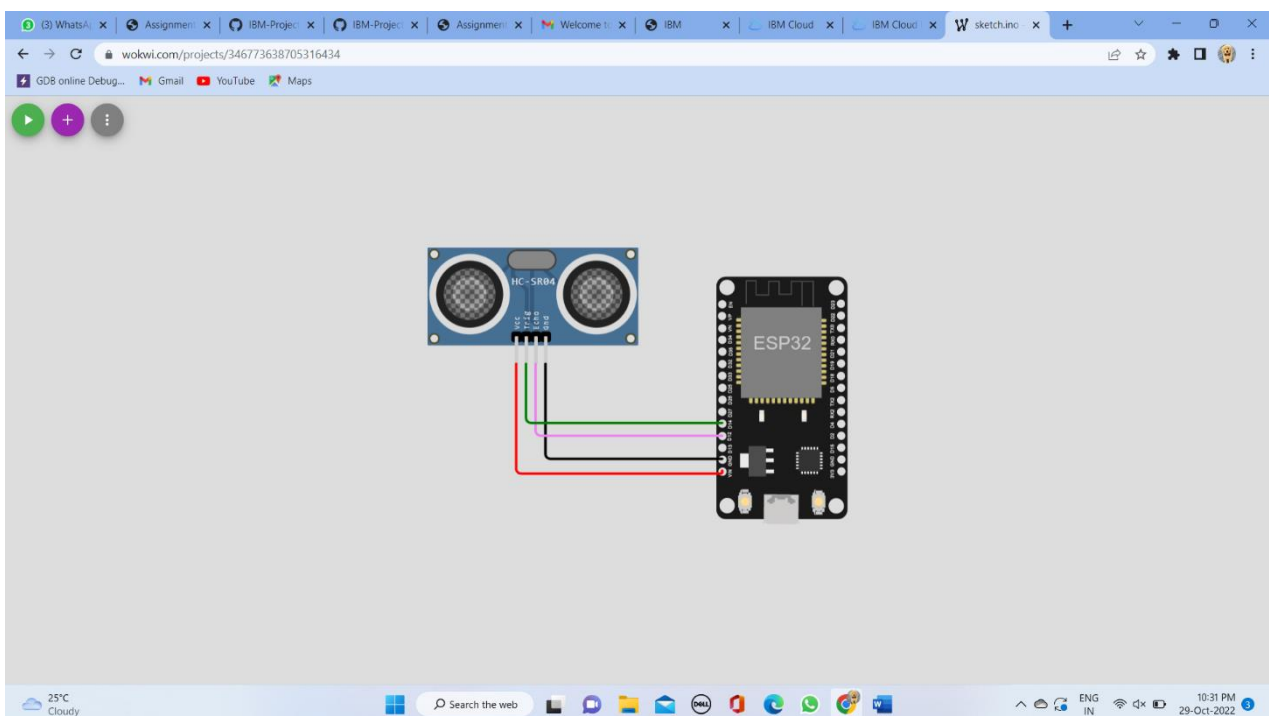
```

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

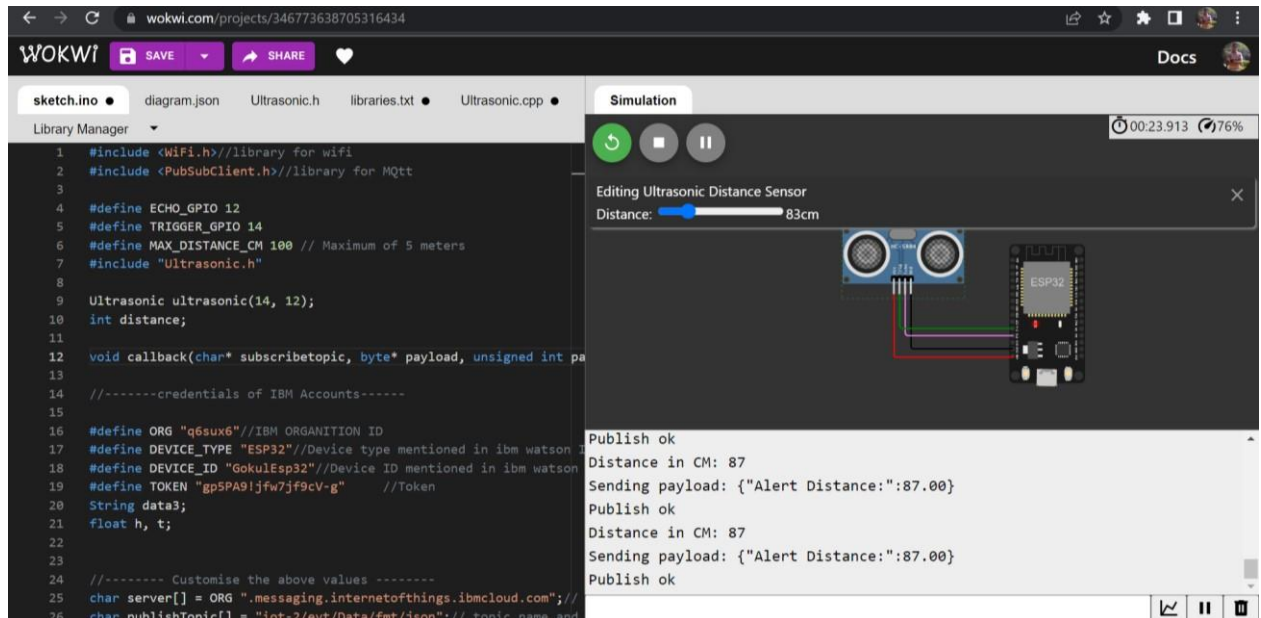
    Serial.print("callback invoked for topic: ");
    Serial.println(subscribetopic);    for (int i =
0; i < payloadLength; i++) {        data3 +=
(char)payload[i];
    }
    Serial.println("data: "+ data3);
    if(data3=="lighton")    {
        Serial.println(data3);
    }
    else
    {
        Serial.println(data3);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

```

CIRCUIT DIAGRAM:



OUTPUT:



The screenshot displays the Wokwi IDE interface. The 'Recent Events' tab is selected, showing a table of events. The table has the following columns: Event, Value, Format, and Last Received. The events listed are:

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>