

ASSIGNMENT

4

Date	24 October 2022
Team ID	PNT2022TMID52810
Project Name	Project - Signs with Smart Connectivity for Better Road Safety
Maximum Marks	4 Marks

Project Title: Signs with Smart Connectivity for Better Road Safety

Team ID: PNT2022TMID52810

Team Members:

- | | |
|---------------------|---------|
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| 2. KUMARESH V | 2004202 |
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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.

CODE:

```
#include <WiFi.h> //library for wifi
#include <WiFiClient.h>
#include <PubSubClient.h> //library for MQTT
// creating the instance by passing pin and typr of dht connected
float distance;
#define sound_speed 0.034
int trigpin=18;
int echopin=19;
int led=5;
int LED=9;
long duration;
String message; // creating the instance by passing pin and typr of dht connected

void callback(char* subscribetopic, byte* payload, unsigned int payloadLength);

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

#define ORG "tmwrsv" //IBM ORGANITION ID
#define DEVICE_TYPE "iot_new" //Device type mentioned in ibm watson IOT Platform
#define DEVICE_ID "1110" //Device ID mentioned in ibm watson IOT Platform
#define TOKEN "BLQ_@ZfeL)6L@FM?kg" //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);
    pinMode(trigpin,OUTPUT);
    pinMode(echopin,INPUT);
    pinMode(led,OUTPUT);
    delay(10);
    Serial.println();
    wificonnect();
    mqttconnect();
}

void loop()// Recursive Function
{

    digitalWrite(trigpin,LOW);
    digitalWrite(trigpin,HIGH);
    delay(1000);
    digitalWrite(trigpin,LOW);
    duration=pulseIn(echopin,HIGH);
    distance=duration*sound_speed/2;
    Serial.println("distance"+String(distance)+"cm");
    if(distance<100)
    {
        message="Alert";
        digitalWrite(led,HIGH);
    } else
    {
        message="No problem";
        digitalWrite(led,LOW);
    }
    delay(1000);
    PublishData(distance,message);
    // if (!client.loop()) {
    //     mqttconnect();
    // }
}

```

```

/*.....retrieving to
Cloud.....*/

void PublishData(float d, String a) {
  mqttconnect();//function call for connecting to ibm
  /*
    creating the String in in form JSon to update the data to ibm cloud
  */
  String payload = "{\"distance\":";
  payload += d; payload += "}";
  payload += "," "{\"message\":";
  payload += a;
  payload += "}";

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

  if (client.publish(publishTopic, (char*) payload.c_str())) {
    Serial.println("Publish ok");// if it sucessfully 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 defination 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) {

```

```

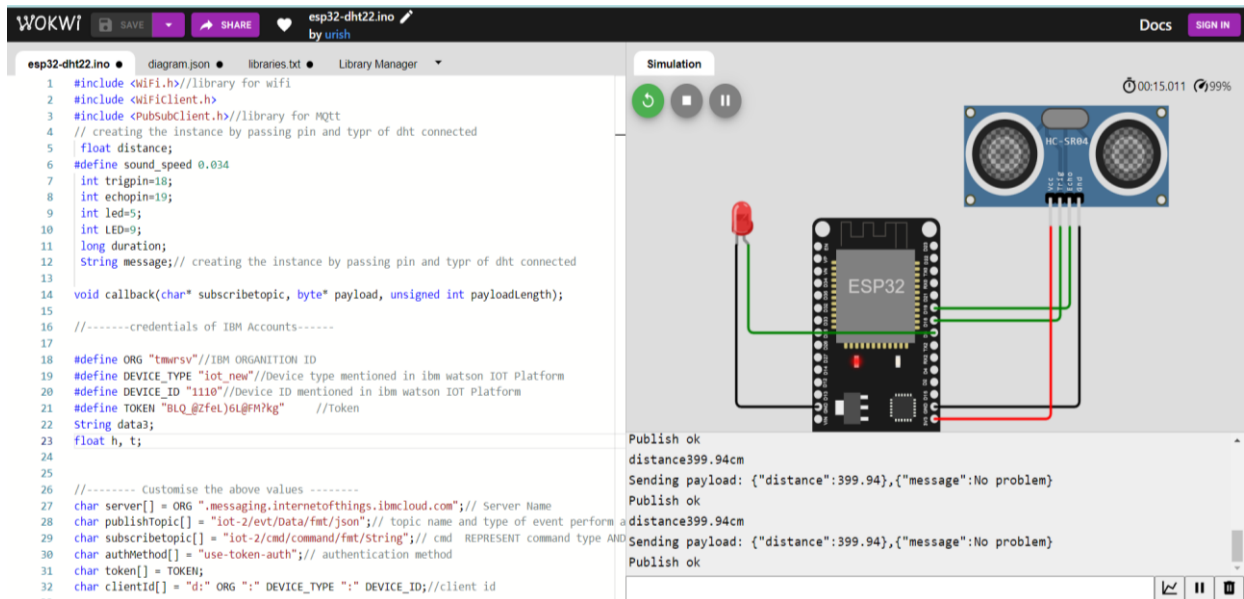
        delay(500);
        Serial.print(".");
    }
    Serial.println("");
    Serial.println("WiFi connected");
    Serial.println("IP address: ");
    Serial.println(WiFi.localIP());
}

void initManagedDevice() {
    if (client.subscribe(subscribetopic)) {
        Serial.println((subscribetopic));
        Serial.println("subscribe to cmd OK");
    } else {
        Serial.println("subscribe to cmd FAILED");
    }
}

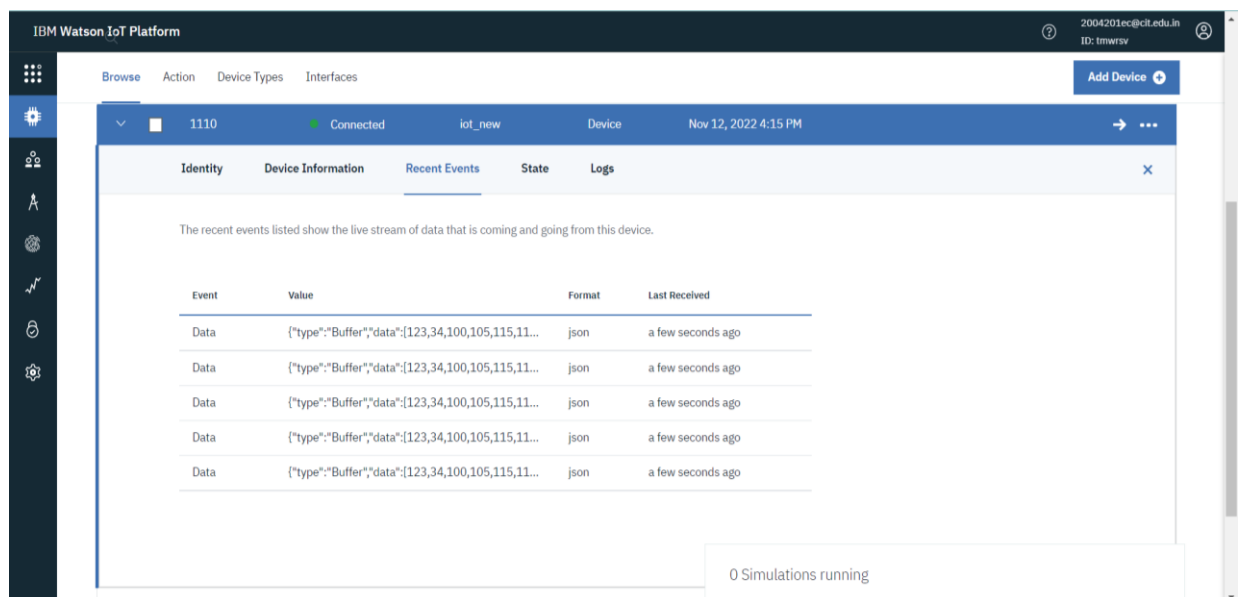
void callback(char* subscribetopic, byte* payload, unsigned int payloadLength)
{
    Serial.print("callback invoked for topic: ");
    Serial.println(subscribetopic);
    for (int i = 0; i < payloadLength; i++) {
        //Serial.print((char)payload[i]);
        data3 += (char)payload[i];
    }
    Serial.println("data: "+ data3);
    if(data3=="lighton")
    {
        Serial.println(data3);
        digitalWrite(LED,HIGH);
    }
    else
    {
        Serial.println(data3);
        digitalWrite(LED,LOW);
    }
    data3="";
}

```

SCHEMATIC/CIRCUIT DIAGRAM:



IBM CLOUD OUTPUT:



WOKWI LINK:

<https://wokwi.com/projects/348125118743970386>