

## ASSIGNMENT 04

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ROLL NUMBER : CITC1904079

TEAM ID : **PNT2022TMID52822**

WOKWI CODE:

Link : <https://wokwi.com/projects/348109588842676818>

```
#include <WiFi.h> //library for wifi
#include <WiFiClient.h>
#include <PubSubClient.h> //library for MQTT
// creating the instance by passing pin and type 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 type of dht
connected

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

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

#define ORG "9w42t3"
#define DEVICE_TYPE "Wokwi_Bavi"
#define DEVICE_ID "123456789"
#define TOKEN "+59ElkeP8c2d82)X?U" //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*soun_d_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="";
}
```

## **IBM WATSON IoT PLATFORM:**

IBM Watson IoT Platform

1904072ece@cit.edu.in ID: 9w42t3

Browse Action Device Types Interfaces Add Device

Search by Device ID Device Simulator

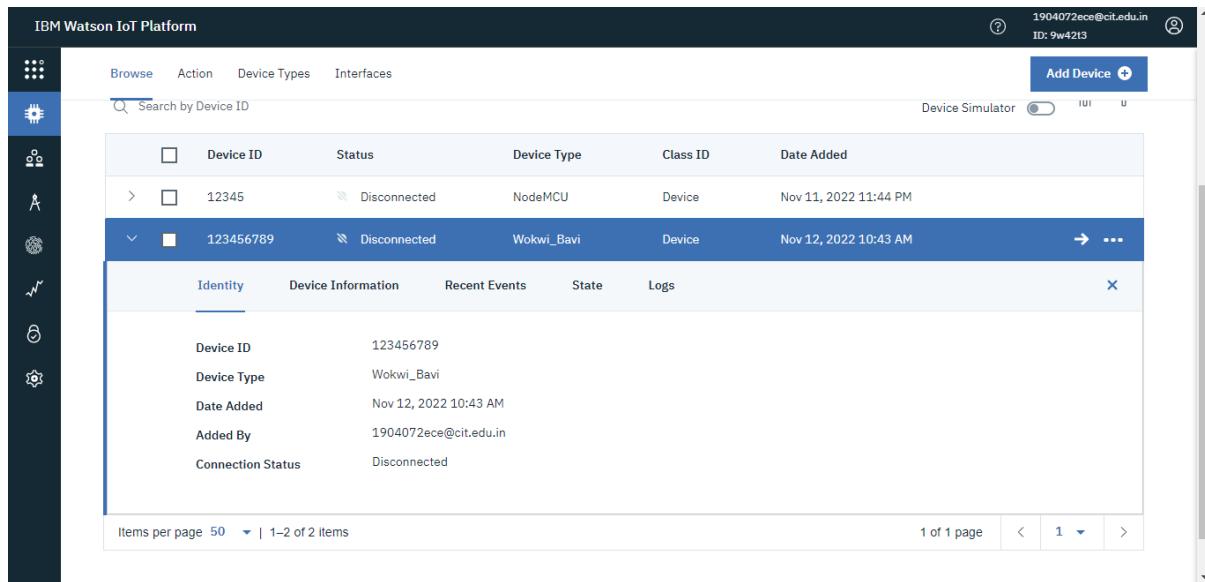
Device ID	Status	Device Type	Class ID	Date Added
12345	Disconnected	NodeMCU	Device	Nov 11, 2022 11:44 PM
123456789	Disconnected	Wokwi_Bavi	Device	Nov 12, 2022 10:43 AM

Identity Device Information Recent Events State Logs

Device ID: 123456789  
Device Type: Wokwi\_Bavi  
Date Added: Nov 12, 2022 10:43 AM  
Added By: 1904072ece@cit.edu.in  
Connection Status: Disconnected

Items per page: 50 | 1–2 of 2 items

1 of 1 page | < | 1 | >



IBM Watson IoT Platform

1904072ece@cit.edu.in ID: 9w42t3

Browse Action Device Types Interfaces

This table shows a summary of all devices that have been added. It can be filtered, organized, and searched on using different criteria. To get started, you can add devices by using the Add Device button, or by using API.

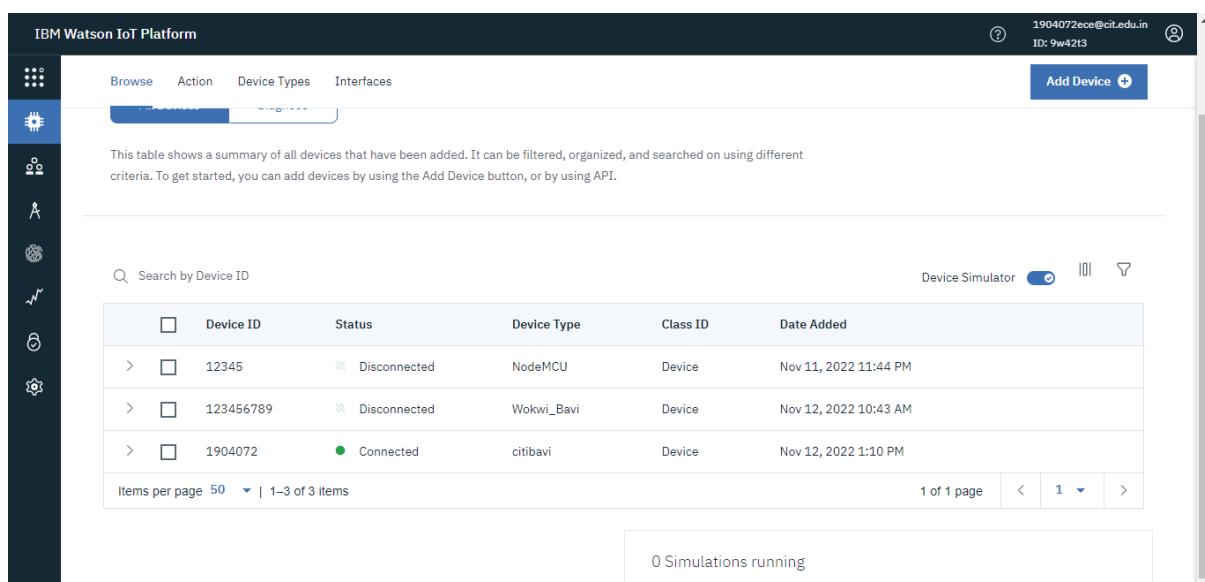
Search by Device ID Device Simulator

Device ID	Status	Device Type	Class ID	Date Added
12345	Disconnected	NodeMCU	Device	Nov 11, 2022 11:44 PM
123456789	Disconnected	Wokwi_Bavi	Device	Nov 12, 2022 10:43 AM
1904072	Connected	citibavi	Device	Nov 12, 2022 1:10 PM

Items per page: 50 | 1–3 of 3 items

1 of 1 page | < | 1 | >

0 Simulations running



## OUTPUT SNIPS:

WOKWI SAVE SHARE ASSIGNMENT 04 ibm Docs

sketch.ino

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5 float distance;
6 #define sound_speed 0.034
7 int trigpin=18;
8 int echopin=19;
9 int led=5;
10 int LED=9;
11 long duration;
12 String message;// creating the instance by passing pin and type of dht connected
13 void callback(char* subscribetopic, byte* payload, unsigned int payloadLength)
14 {
15 //-----credentials of IBM Accounts-----
16
17 #define ORG "9w42t3"//IBM ORGANITION ID
18 #define DEVICE_TYPE "citibavi"/Device type mentioned in ibm watson IOT Platform
19 #define DEVICE_ID "1904072"//Device ID mentioned in ibm watson IOT Platform
20 #define TOKEN "gdZ?m?FsdSX0XHCW!L" //Token
21 String data3;
22 float h, t;
23
24 //----- Customise the above values -----
25 char server[] = ORG ".messaging.internetofthings.ibmcloud.com";// Server Name
26 char publishTopic[] = "iot-2/evt>Data/fmt/json";// topic name and type of even
27 char subscribeTopic[] = "iot-2/cmd/command/fmt/String";// cmd _REPRESENT command
28
29 char_subscribetopicf1 = "iot-2/cmd/command/fmt/String":// cmd _REPRESENT command

```

Simulation

00:50:837 5%  
Publish ok  
distance399.94cm  
Sending payload: {"distance":399.94}, {"message": "No problem"}  
Publish ok  
distance399.96cm  
Sending payload: {"distance":399.96}, {"message": "No problem"}  
Publish ok

WOKWI SAVE SHARE ASSIGNMENT 04 ibm Docs

sketch.ino

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29 char_subscribetopicf1 = "iot-2/cmd/command/fmt/String":// cmd _REPRESENT command

```

Simulation

01:23:546 86%  
Publish ok  
distance244.95cm  
Sending payload: {"distance":244.95}, {"message": "No problem"}  
Publish ok  
distance244.95cm  
Sending payload: {"distance":244.95}, {"message": "No problem"}  
Publish ok

