

Assignment-4

IoT

Assignment Date	27 September 2022
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Team ID	PNT2022TMID38652
Maximum Marks	2 Marks

Question-1:

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>
#include <PubSubClient.h>
#define ECHO_PIN 2
#define TRIG_PIN 4
#define LED 5

//IBM credential

#define ORG "r5gra1"
#define DEVICE_TYPE "Dora"
#define DEVICE_ID "30"
#define TOKEN "12345678"

//Customise the above values

char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
char publishTopic[] = "iot-2/type/Dora/id/30/evt/IoTSensor/fmt/json";
char subscribetopic[] = "iot-2/cmd/test/fmt/String";
char authMethod[] = "use-token-auth";
char token[] = TOKEN;
char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;
```

```

//---

WiFiClient wifiClient;
PubSubClient client(server, 1883,wifiClient);
void setup()
{
    Serial.begin(115200);
    pinMode(TRIG_PIN, OUTPUT);
    pinMode(ECHO_PIN, INPUT);
    pinMode(LED,OUTPUT);
    delay(10);
    Serial.println();
    wificonnect();
    mqttconnect();
}

float readDistanceCM() {
    digitalWrite(TRIG_PIN, LOW);
    delayMicroseconds(2);
    digitalWrite(TRIG_PIN, HIGH);
    delayMicroseconds(10);
    digitalWrite(TRIG_PIN, LOW);
    int duration = pulseIn(ECHO_PIN, HIGH);
    return duration * 0.034 / 2;
}

void loop()
{
    float distance = readDistanceCM();
    bool isNearby = distance < 100;
    digitalWrite(LED, isNearby);
    Serial.print("Distance: ");
    Serial.println(distance);
    delay(100);
    if (isNearby == 1){
        PublishData(distance);
    }
    delay(1000);
    if (!client.loop()) {
        mqttconnect();
    }
}

```

```

void PublishData(float distance) {
    mqttconnect();
    String payload = "{\"Alert\":\"\"";
    payload += distance;
    payload += " is less than 100cms\"";
    payload += "}";

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

    if (client.publish(publishTopic, (char*) payload.c_str())) {
        Serial.println("Publish ok");
    }
    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()
{
    Serial.println();
    Serial.print("Connecting to ");

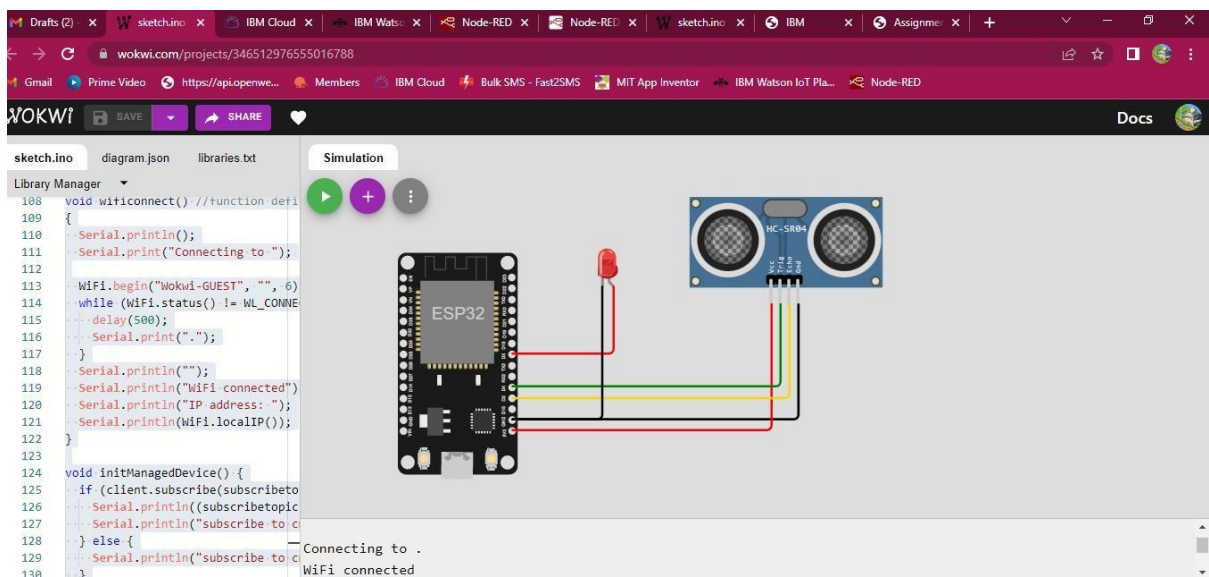
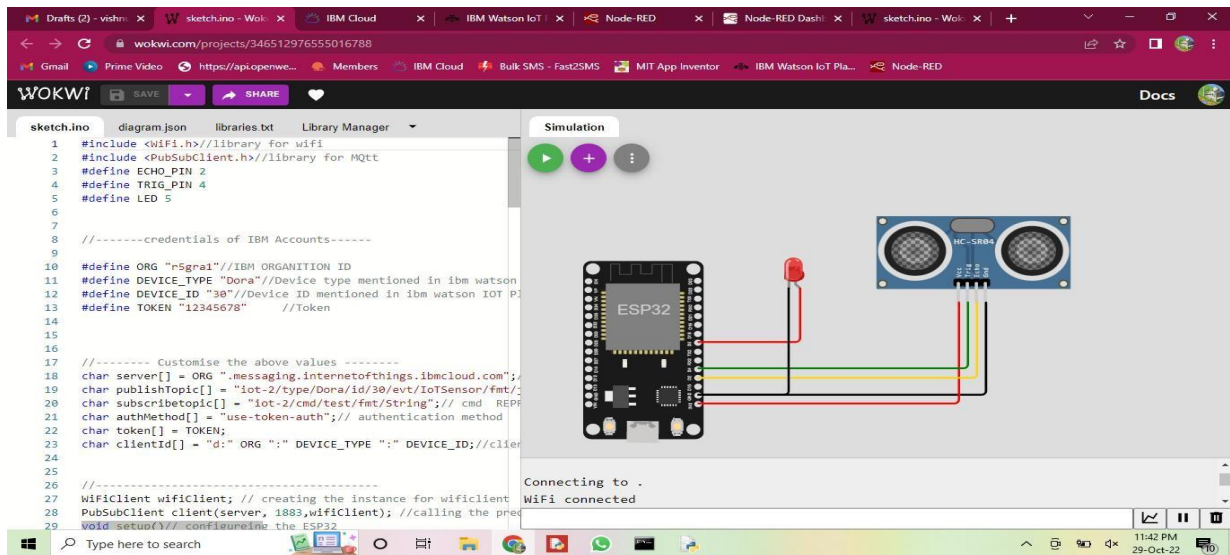
    WiFi.begin("Wokwi-GUEST", "", 6);
    while (WiFi.status() != WL_CONNECTED) {
        delay(500);
        Serial.print(".");
    }
    Serial.println("");
    Serial.println("WiFi connected");
    Serial.println("IP address: ");
    Serial.println(WiFi.localIP());
}

```

```

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

```



OUTPUT:

The screenshot displays the IBM Watson IoT Platform dashboard for a device named 'r5gra1'. The dashboard is viewed through a web browser with multiple tabs open, including 'Drafts (2) - vishn...', 'sketch.ino - Wok...', 'IBM Cloud', 'IBM Watson IoT', 'Node-RED', and 'Node-RED Dash...'. The browser address bar shows the URL 'r5gra1.internetofthings.ibmcloud.com/dashboard/devices/browse'.

The dashboard interface includes a top navigation bar with 'Browse', 'Action', 'Device Types', and 'Interfaces'. A left sidebar contains icons for various functions. The main content area is divided into tabs: 'Identity', 'Device Information', 'Recent Events', 'State', and 'Logs'. The 'Recent Events' tab is active, displaying a message: 'The recent events listed show the live stream of data that is coming and going from this device.'

Below the message is a table with the following data:

Event	Value	Format	Last Received
IoTSensor	{"dist":3,"cmd":"Alert"}	json	a few seconds ago
IoTSensor	{"dist":93,"cmd":"Alert"}	json	a few seconds ago
IoTSensor	{"dist":75,"cmd":"Alert"}	json	a few seconds ago
IoTSensor	{"dist":195}	json	a few seconds ago
IoTSensor	{"dist":92,"cmd":"Alert"}	json	a few seconds ago

On the right side of the dashboard, a user profile card is visible for 'r5gra1' (ID: r5gra1, Bluemix Free). It includes links for 'Service Status', 'Terms', 'Privacy', 'Support', and 'Blog', along with a 'Sign Out' button. The system clock at the bottom right indicates the time is 11:43 PM on 29-Oct-22.

REFERENCE :

<https://wokwi.com/projects/346512976555016788>

<https://r5gra1.internetofthings.ibmcloud.com/dashboard/devices/browse>