

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 ");

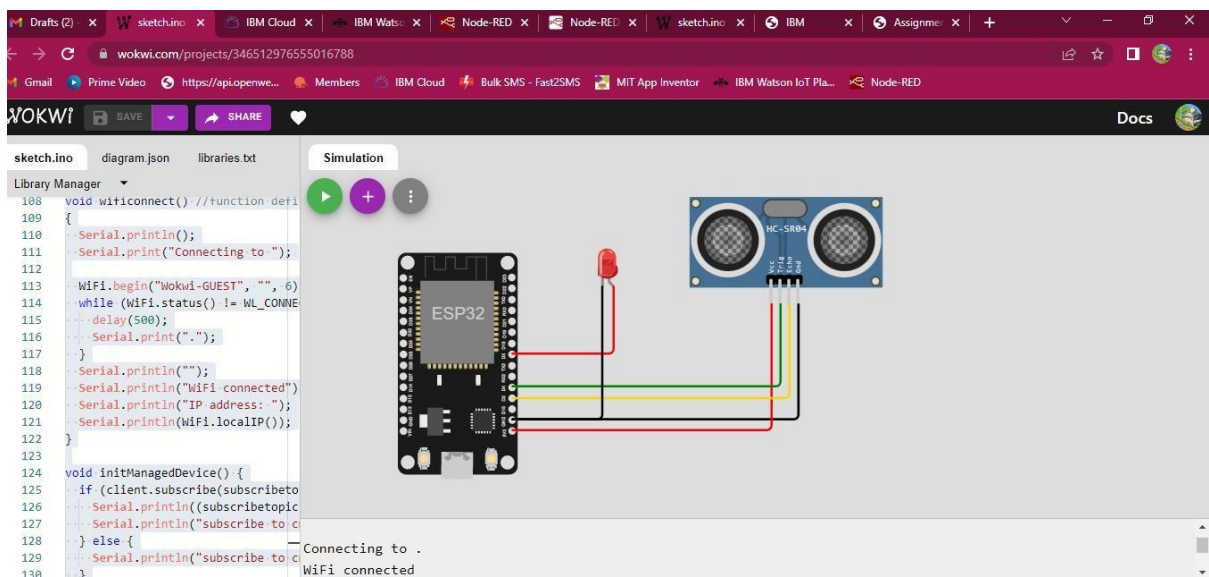
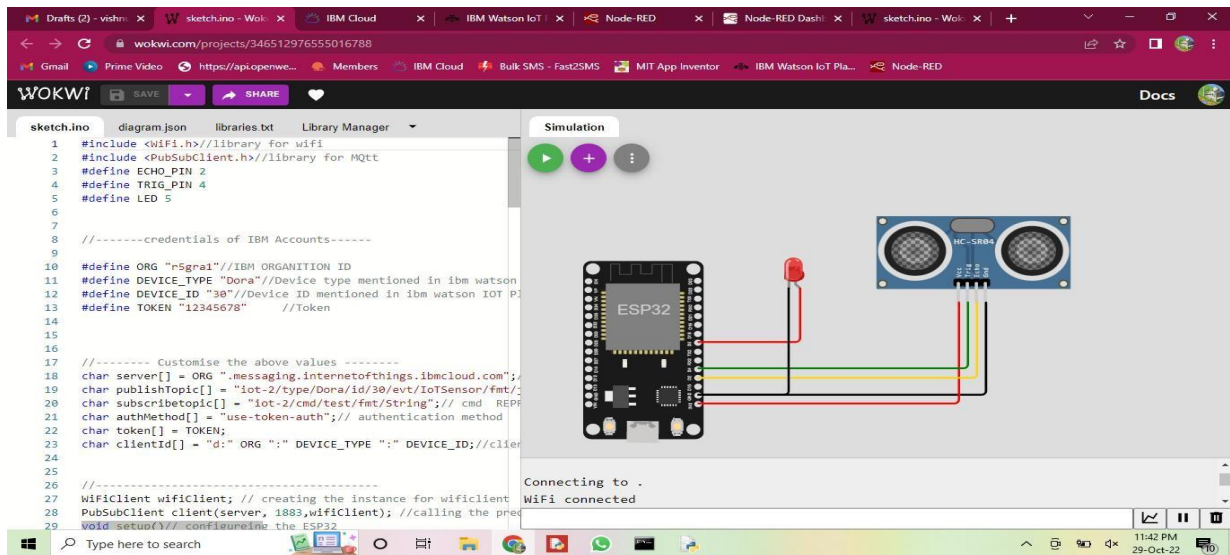
    WiFi.begin("Wokwi-GUEST", "", 6);
    while (WiFi.status() != WL_CONNECTED) {
        delay(500);
        Serial.print(".");
    }
    Serial.println("");
    Serial.println("WiFi connected");
    Serial.println("IP address: ");
    Serial.println(WiFi.localIP());
}

```

```

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 divided into several sections: Identity, Device Information, Recent Events, State, and Logs. The 'Recent Events' section is currently selected, showing a table of live data streams. The table has four columns: Event, Value, Format, and Last Received. The events are from an 'IoTSensor' and represent distance measurements in centimeters, each followed by a command 'Alert!'. The values are 3, 93, 75, 195, and 92. The format for all events is 'json', and they were all received 'a few seconds ago'. On the right side of the dashboard, there is a user profile for 'r5gra1' with the ID 'r5gra1' and the account type 'Bluemix Free'. Below the profile, there are links for 'Service Status', 'Terms', 'Privacy', 'Support', and 'Blog', along with a 'Sign Out' button. The top of the browser window shows multiple tabs, including 'Drafts (2) - vishn...', 'sketch.ino - Wok...', 'IBM Cloud', 'IBM Watson IoT...', 'Node-RED', and 'Node-RED Dash...'. The bottom of the screen shows the Windows taskbar with various application icons and the system clock indicating 11:43 PM on 29-Oct-22.

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

REFERENCE :

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

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