

**Assignment -1**  
Python Programming

Assignment Date	19 September 2022
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Maximum Marks	2 Marks

**Question-1:**

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.

**Solution:**

```
#include <WiFi.h>
#include <PubSubClient.h>
WiFiClient wifiClient;
String data3;
#define ORG "j4rf38"
#define DEVICE_TYPE "Praveenkumar"
#define DEVICE_ID "123456"
#define TOKEN "12345678"
#define speed 0.034
#define led 14
char server[] = ORG
".messaging.internetofthings.ibmcloud.com";
char publishTopic[] = "iot-
2/evt/Praveenkumar/fmt/json";
char topic[] = "iot-
2/cmd/led/fmt/String";
char authMethod[] = "use-token-auth";
char token[] = TOKEN;
char clientId[] = "d:" ORG ":" DEVICE_TYPE
":" DEVICE_ID;
PubSubClient client(server, 1883,
wifiClient);
```

```
const int trigpin=5;
const int echopin=18;
String command;
String data="";
```

```
long duration;
float dist;
```

```
void setup()
{
  Serial.begin(115200);
  pinMode(led, OUTPUT);
  pinMode(trigpin, OUTPUT);
  pinMode(echopin, INPUT);
```

```

    wifiConnect();
    mqttConnect();
}

void loop() {
    bool isNearby = dist < 100;
    digitalWrite(led, isNearby);

    publishData();
    delay(500);

    if (!client.loop()) {
        mqttConnect();
    }
}

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

void mqttConnect() {
    if (!client.connected()) {
        Serial.print("Reconnecting MQTT client to ");
        Serial.println(server);
        while (!client.connect(clientId, authMethod, token)) {
            Serial.print(".");
            delay(500);
        }
        initManagedDevice();
        Serial.println();
    }
}

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

void publishData()
{
    digitalWrite(trigpin, LOW);
    digitalWrite(trigpin, HIGH);
    delayMicroseconds(10);
    digitalWrite(trigpin, LOW);
    duration=pulseIn(echopin, HIGH);
    dist=duration*speed/2;
}

```

```

if(dist<100){
    String payload = "{\"Alert
Distance\":\"";
    payload += dist;
    payload += "}";

    Serial.print("\n");
    Serial.print("Sending payload: ");
    Serial.println(payload);
    if (client.publish(publishTopic,
(char*) payload.c_str())) {
        Serial.println("Publish OK");
    }
}

if(dist>100){
    String payload = "{\"Distance\":\"";
    payload += dist;
    payload += "}";

    Serial.print("\n");
    Serial.print("Sending payload: ");
    Serial.println(payload);
    if(client.publish(publishTopic,
(char*) payload.c_str())) {
        Serial.println("Publish OK");
    }else {
        Serial.println("Publish FAILED");
    }
}

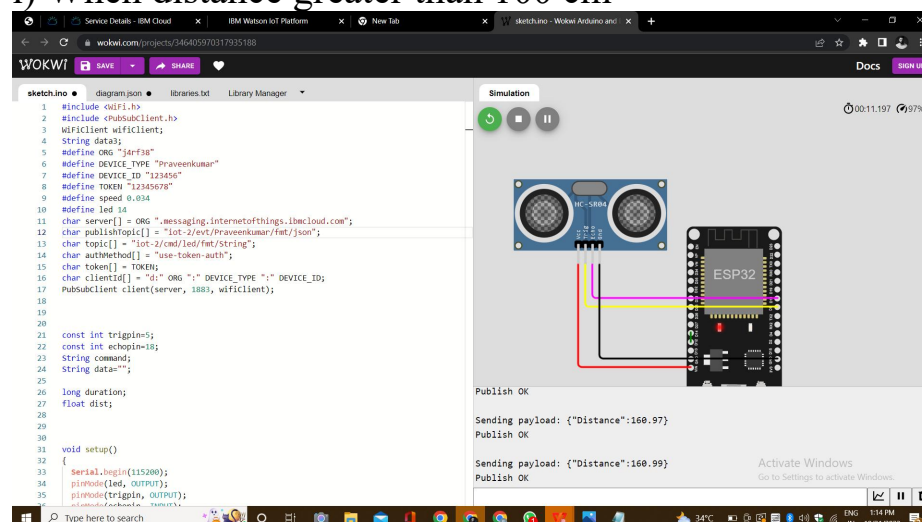
}

}

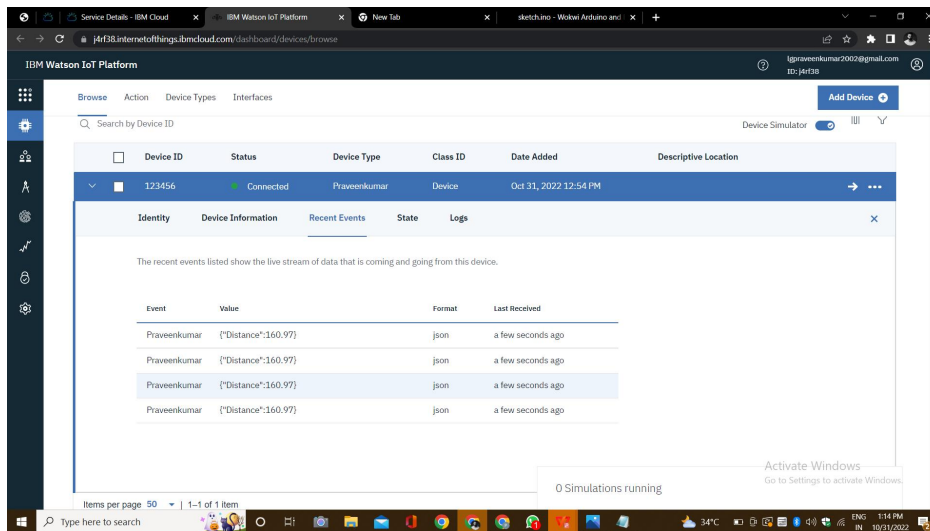
```

## OUTPUT:-

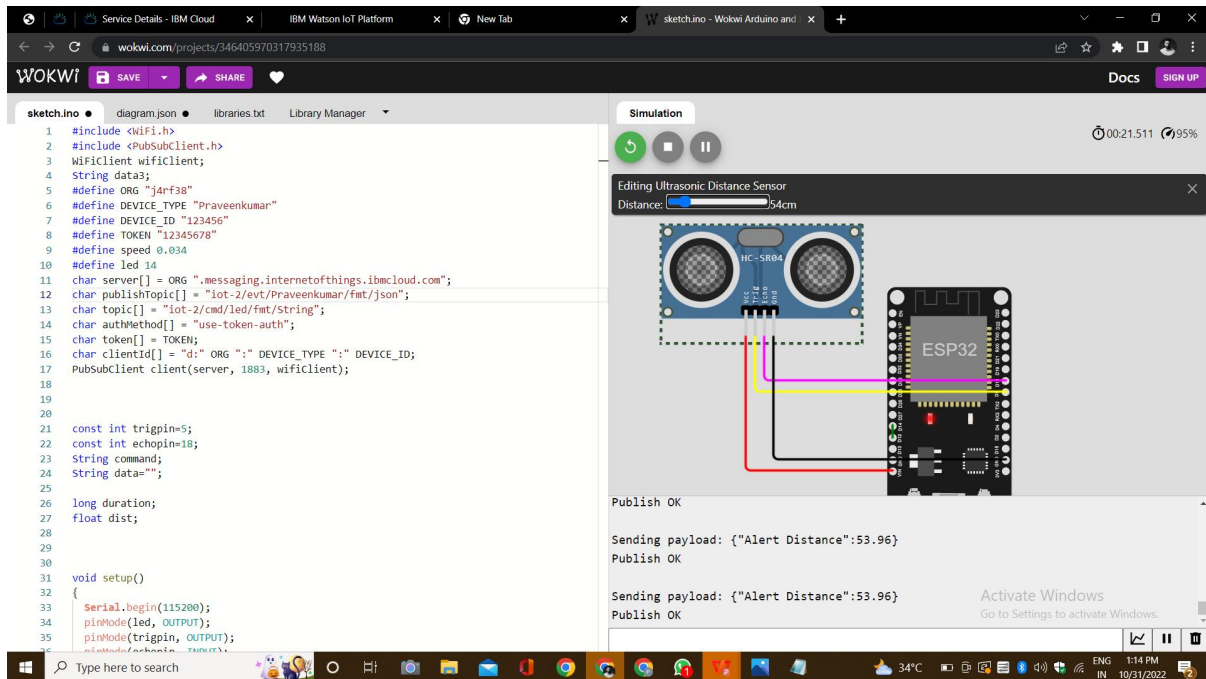
i) When distance greater than 100 cm



## IBM RECENT EVENTS



ii) When distance less than 100



IBM RECENT EVENTS

The screenshot displays the IBM Watson IoT Platform interface. At the top, there's a navigation bar with tabs for 'Service Details - IBM Cloud', 'IBM Watson IoT Platform', and 'New Tab'. The main header shows the user's email 'lgpraveenkumar2002@gmail.com' and ID 'j4rf38'. Below the header, there's a search bar and a 'Device Simulator' toggle. The main content area shows a table of devices. The selected device 'Praveenkumar' (ID: 123456) is shown in a detailed view with tabs for 'Identity', 'Device Information', 'Recent Events', 'State', and 'Logs'. The 'Recent Events' tab is active, showing a live stream of data. The events table has columns for 'Event', 'Value', 'Format', and 'Last Received'. The events are all from 'Praveenkumar' with the value '["Alert Distance":53.96]' in 'json' format, received 'a few seconds ago'.

Event	Value	Format	Last Received
Praveenkumar	["Alert Distance":53.96]	json	a few seconds ago
Praveenkumar	["Alert Distance":53.96]	json	a few seconds ago
Praveenkumar	["Alert Distance":53.96]	json	a few seconds ago
Praveenkumar	["Alert Distance":53.96]	json	a few seconds ago
Praveenkumar	["Alert Distance":53.96]	json	a few seconds ago

0 Simulations running

WOKWI LINK -

<https://wokwi.com/projects/346405970317935188>