

Assignment -4
Wowki Simulation with IBM Watson

Assignment Date	19 November 2022
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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.

Wowki Code:

```
#include <WiFi.h>
#include <PubSubClient.h>
#include <ArduinoJson.h>

WiFiClient wifiClient;

#define ORG "luicm6"
#define DEVICE_TYPE "ThisDevice"
#define DEVICE_ID "12309"
#define TOKEN "V2oLr-jJK48pMO8rHx"
#define speed 0.034

char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
char publishTopic[] = "iot-2/evt/Data/fmt/json";
char topic[] = "iot-2/cmd/home/fmt/String";
char authMethod[] = "use-token-auth";
char token[] = TOKEN;
char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;
PubSubClient client(server, 1883, wifiClient);
void publishData();

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

long duration;
int dist;

void setup()
```

```

{
  Serial.begin(115200);
  pinMode(trigpin, OUTPUT);
  pinMode(echopin, INPUT);
  wifiConnect();
  mqttConnect();
}

void loop() {

  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(1000);
    }
    initManagedDevice();
    Serial.println();
  }
}

void initManagedDevice() {
  if (client.subscribe(topic)) {
    Serial.println(client.subscribe(topic));
    Serial.println("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){
        DynamicJsonDocument doc(1024);
        String payload;
        doc["AlertDistance:"]=dist;
        serializeJson(doc, payload);
        delay(3000);
        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");
        }
    }
}
}

```

IBM Cloud Output:

The screenshot displays the IBM Watson IoT Platform dashboard. The main interface shows a table of devices with columns for Device ID, Status, Device Type, Class ID, and Date Added. A device with ID 12309 is highlighted as 'Connected'. Below this, the 'Recent Events' tab is active, showing a stream of events with columns for Event, Value, Format, and Last Received. The events are JSON payloads containing 'AlertDistance' values.

Overlaid on the dashboard is a simulation window titled '1 item selected' and 'Cancel'. It shows '1/50 Simulations Running' and a 'New Simulation' button. The simulation is set for 'Device Type: ThisDevice' and '1 Event'. A list of devices is shown, with '12309' selected. At the bottom of the simulation window, it indicates '777 events sent' and '22.12 KB sent'.

Event	Value	Format	Last Received
event_hand	{"AlertDistance":44}	json	a few seconds ago
event_hand	{"AlertDistance":86}	json	a few seconds ago
event_hand	{"AlertDistance":52}	json	a few seconds ago
event_hand	{"AlertDistance":23}	json	a few seconds ago
event_hand	{"AlertDistance":40}	json	a few seconds ago

WOWKI OUTPUT:

WOKWI

esp32-dht22.ino by unish

```
1 #include <WiFi.h>
2 #include <PubSubClient.h>
3 #include <ArduinoJson.h>
4
5 WiFiClient wificlient;
6
7 #define ORG "luicmg"
8 #define DEVICE_TYPE "thisDevice"
9 #define DEVICE_ID "12309"
10 #define TOKEN "V2o1r-j3K48pM08Rhx"
11 #define speed 0.034
12
13 char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
14 char publishTopic[] = "iot-2/evt/data/fmt/json";
15 char topic[] = "iot-2/cmd/home/fmt/String";
16 char authMethod[] = "use-token-auth";
17 char token[] = TOKEN;
18 char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;
19 PubSubClient client(server, 1883, wificlient);
20 void publishData();
21
22
23 const int trigpin=5;
24 const int echopin=18;
25 String command;
26 String data="";
27
28 long duration;
29 int dist;
30
31 void setup()
32 {
33   Serial.begin(115200);
34   pinMode(trigpin, OUTPUT);
35   pinMode(echopin, INPUT);
36   WiFiConnect();
37 }
```

Simulation

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ESP32

HC-SR04

Publish OK

Sending payload: {"AlertDistance":0}

Publish OK

Sending payload: {"AlertDistance":0}

Publish OK

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