

PROJECT DEVELOPMENT - DELIVERY OF SPRINT 2

Date:	17 November 2022
Team ID:	PNT2022TMID04601
Name:	Real-Time River Water Quality Monitoring and Control System

PYTHON CODE

```
import time
import sys
import ibmiotf.application
import ibmiotf.device
import random

#Provide your IBM Watson Device Credentials
organization = "uyyqeq"
deviceType = "12345"
deviceId = "12345"
authMethod = "token"
authToken = "12345678"

# Initialize GPIO
def myCommandCallback(cmd):
    print("Command received: %s" % cmd.data['command'])
    status=cmd.data['command']
    if status=="light on":
        print ("led is on")
    elif status == "light off":
        print ("led is off")
    else :
        print ("please send proper command")

try:
    deviceOptions = {"org": organization, "type": deviceType, "id": deviceId, "auth-method": authMethod,
"auth-token": authToken}
    deviceCli = ibmiotf.device.Client(deviceOptions)
    #.....

except Exception as e:
    print("Caught exception connecting device: %s" % str(e))
    sys.exit()

# Connect and send a datapoint "hello" with value "world" into the cloud as an event of type "greeting" 10
times
deviceCli.connect()

while True:
    #Get Sensor Data from DHT11

    temp=random.randint(90,110)
    Humid=random.randint(60,100)

    data = { 'temp' : temp, 'Humid': Humid }
    #print data
    def myOnPublishCallback():
        print ("Published Temperature = %s C" % temp, "Humidity = %s %" % Humid, "to IBM Watson")

    success = deviceCli.publishEvent("IoTSensor", "json", data, qos=0,
```

```

on_publish=myOnPubl
ishCallback) if
not success:
    print("Not
connected to IoT")
time.sleep(10)

```

```
deviceCli.commandCallback = myCommandCallback
```

```
# Disconnect the device and application from the clouddeviceCli.disconnect()
```

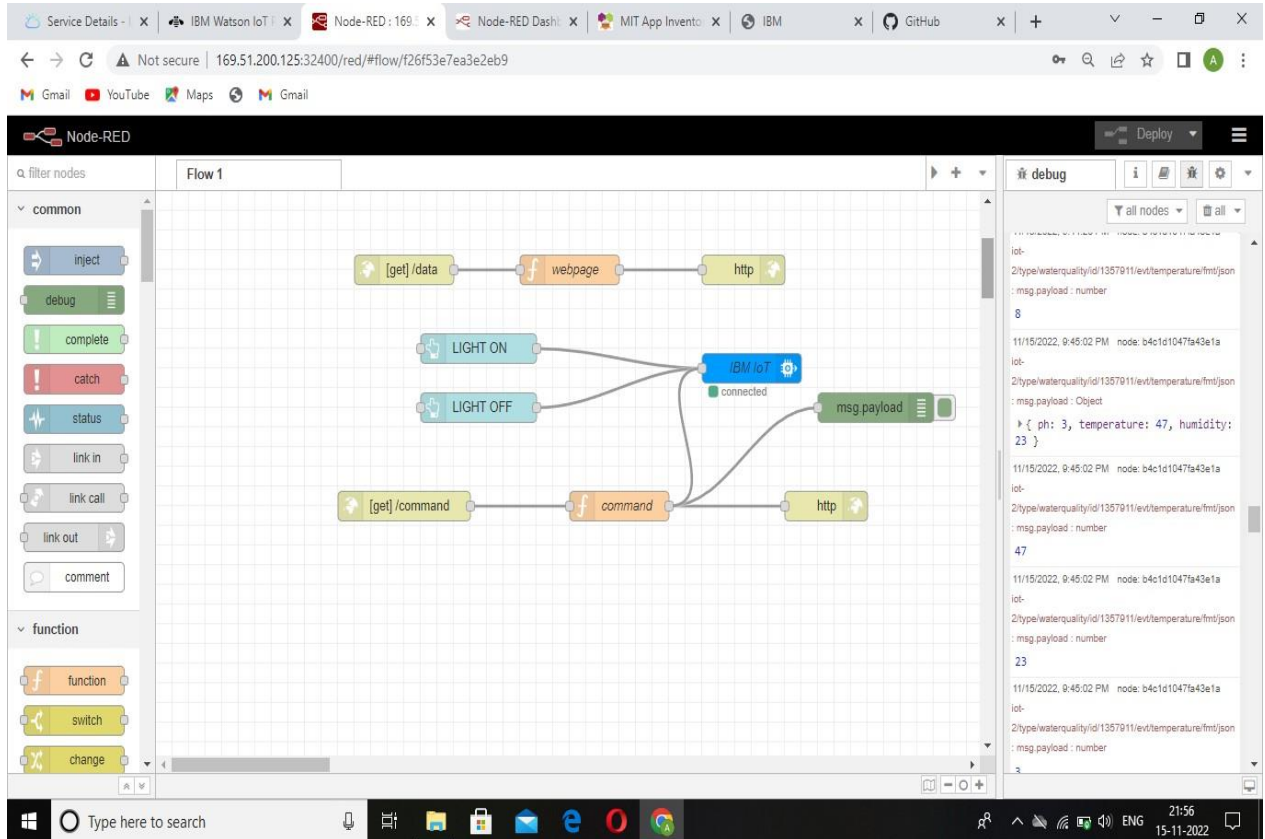
```

Python 3.9.10
File Edit Shell Debug Options Window Help
Python 3.9.10 (tags/v3.9.10:f2f3f53, Jan 17 2022, 15:01:48) [MSC v.1929 32 bit (Intel)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
===== RESTART: C:\Users\vinay\Downloads\ibmiotpublishsubscribe.py =====
2022-11-14 19:36:48,951 ibmiotf.device.Client INFO Connected successfully: d:uyyqeq:12345:12345
Published Temperature = 95 C Humidity = 68 % to IBM Watson
Published Temperature = 90 C Humidity = 92 % to IBM Watson
Published Temperature = 101 C Humidity = 99 % to IBM Watson
Published Temperature = 107 C Humidity = 89 % to IBM Watson
Published Temperature = 96 C Humidity = 63 % to IBM Watson
Published Temperature = 91 C Humidity = 81 % to IBM Watson
Published Temperature = 95 C Humidity = 67 % to IBM Watson
Published Temperature = 104 C Humidity = 83 % to IBM Watson
Published Temperature = 93 C Humidity = 99 % to IBM Watson
Published Temperature = 95 C Humidity = 72 % to IBM Watson
Published Temperature = 97 C Humidity = 99 % to IBM Watson
Published Temperature = 103 C Humidity = 65 % to IBM Watson
Published Temperature = 110 C Humidity = 64 % to IBM Watson
Published Temperature = 92 C Humidity = 93 % to IBM Watson
Published Temperature = 101 C Humidity = 87 % to IBM Watson
Published Temperature = 102 C Humidity = 67 % to IBM Watson
Published Temperature = 91 C Humidity = 94 % to IBM Watson
Published Temperature = 95 C Humidity = 68 % to IBM Watson
Published Temperature = 110 C Humidity = 71 % to IBM Watson
Published Temperature = 100 C Humidity = 79 % to IBM Watson
Published Temperature = 102 C Humidity = 61 % to IBM Watson
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Published Temperature = 103 C Humidity = 70 % to IBM Watson
Published Temperature = 104 C Humidity = 75 % to IBM Watson
Published Temperature = 91 C Humidity = 81 % to IBM Watson
Published Temperature = 99 C Humidity = 98 % to IBM Watson
Published Temperature = 91 C Humidity = 95 % to IBM Watson
Published Temperature = 110 C Humidity = 98 % to IBM Watson
Published Temperature = 106 C Humidity = 86 % to IBM Watson
Published Temperature = 92 C Humidity = 72 % to IBM Watson
Published Temperature = 100 C Humidity = 80 % to IBM Watson
Published Temperature = 107 C Humidity = 97 % to IBM Watson
Published Temperature = 92 C Humidity = 62 % to IBM Watson
Published Temperature = 90 C Humidity = 68 % to IBM Watson
Published Temperature = 106 C Humidity = 65 % to IBM Watson
Published Temperature = 110 C Humidity = 80 % to IBM Watson
Published Temperature = 103 C Humidity = 68 % to IBM Watson
Published Temperature = 110 C Humidity = 94 % to IBM Watson
Published Temperature = 91 C Humidity = 67 % to IBM Watson
Published Temperature = 97 C Humidity = 73 % to IBM Watson
Published Temperature = 97 C Humidity = 84 % to IBM Watson
Published Temperature = 110 C Humidity = 97 % to IBM Watson
Published Temperature = 101 C Humidity = 99 % to IBM Watson
Published Temperature = 90 C Humidity = 69 % to IBM Watson
Published Temperature = 104 C Humidity = 92 % to IBM Watson
Published Temperature = 98 C Humidity = 99 % to IBM Watson
Published Temperature = 107 C Humidity = 84 % to IBM Watson
Published Temperature = 103 C Humidity = 68 % to IBM Watson
Published Temperature = 91 C Humidity = 88 % to IBM Watson

```

Design of webpage application using NODE-RED

Using Dashboard nodes for create UI (Web Application)



Service Details - x IBM Watson IoT x Node-RED: 169 x Node-RED Dash: x MIT App Invento: x IBM x GitHub x + - x

Not secure | 169.51.200.125:32400/red/#flow/t26f53e7ea3e2eb9

Gmail YouTube Maps Gmail

Node-RED

filter nodes

Flow 1

common

- inject
- debug
- complete
- catch
- status
- link in
- link call
- link out
- comment

function

- function
- switch
- change

```
graph LR; IoT1[IBM IoT] --> temp[temperature]; IoT1 --> hum[humidity]; IoT1 --> ph[ph]; temp --> mp1[msg.payload]; hum --> mp1; ph --> mp1; get[/data/] --> webpage[webpage]; webpage --> http[http]; LIGHT_ON[LIGHT ON] --> IoT2[IBM IoT]; LIGHT_OFF[LIGHT OFF] --> IoT2; IoT2 --> mp2[msg.payload];
```

debug

all nodes

```
iot-2/type/waterquality/id/1357911/evnt/temperature/fmt/json : msg.payload : number 8 11/15/2022, 9:45:02 PM node: b4c1d10479a43e1a iot-2/type/waterquality/id/1357911/evnt/temperature/fmt/json : msg.payload : Object { ph: 3, temperature: 47, humidity: 23 } 11/15/2022, 9:45:02 PM node: b4c1d10479a43e1a iot-2/type/waterquality/id/1357911/evnt/temperature/fmt/json : msg.payload : number 47 11/15/2022, 9:45:02 PM node: b4c1d10479a43e1a iot-2/type/waterquality/id/1357911/evnt/temperature/fmt/json : msg.payload : number 23 11/15/2022, 9:45:02 PM node: b4c1d10479a43e1a iot-2/type/waterquality/id/1357911/evnt/temperature/fmt/json : msg.payload : number
```

Type here to search

21:56 15-11-2022

IBM IoT input node configuration

The screenshot displays the Node-RED web interface in a browser. The address bar shows the URL: `169.51.200.125:32400/red/#flow/t26f53e7ea3e2eb9`. The interface includes a left sidebar with node categories (common, function), a central workspace with a flow diagram, and a right sidebar with a 'debug' console.

The 'Edit function node' dialog is open, showing the configuration for the 'temperature' node. The 'Name' field is set to 'temperature'. The 'On Message' tab is selected, and the following JavaScript code is entered:

```
1 global.set('temperature', msg.payload.temperature)
2 msg.payload=msg.payload.temperature
3 return msg;
```

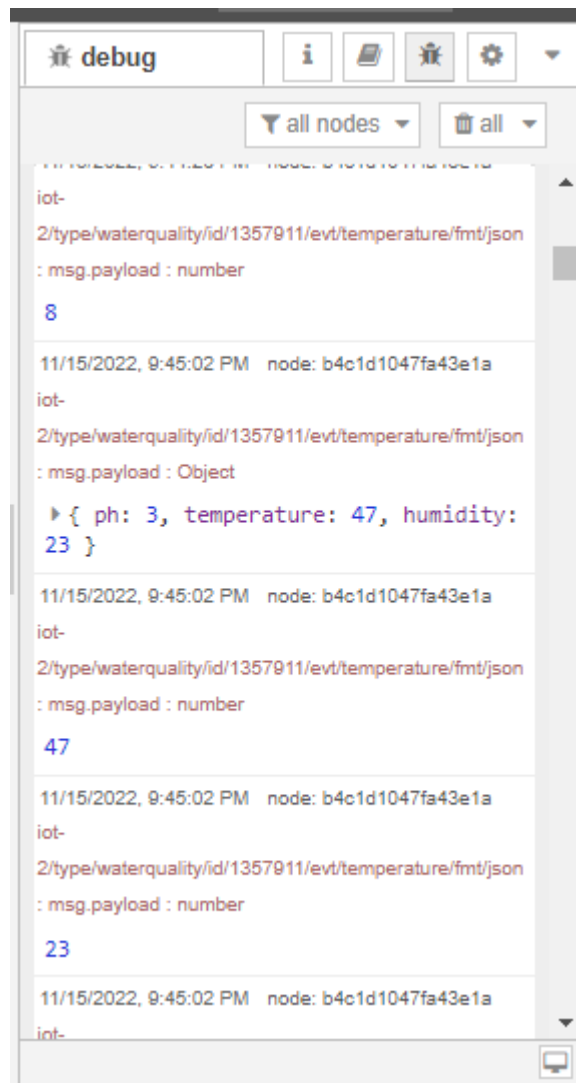
The 'debug' console on the right shows a series of log messages. The first message is:

```
iot-2/type/waterquality/id/1357911/evt/temperature/fmt/json
: msg.payload : number
8
```

Subsequent messages show the temperature value being updated to 47 and then 23, along with a JSON object containing 'phi', 'temperature', and 'humidity'.

The Windows taskbar at the bottom shows the system clock as 22:54 on 15-11-2022.

Debug Node output :



IBM WATSON IoT platform(Sensor reading stored in cloud):

The screenshot displays the IBM Watson IoT Platform interface. The top navigation bar includes the platform name, a user profile icon, and the email address 813819106002@smartinternz.com with ID: pyvd3r. Below the navigation bar, there are tabs for 'Browse', 'Action', 'Device Types', and 'Interfaces'. A sidebar on the left contains various icons for navigation. The main content area shows a table of recent events with the following data:

Event	Value	Format	Last Received
temperature	{"ph":1,"temperature":73,"humidity":10}	json	a few seconds ago
temperature	{"ph":4,"temperature":59,"humidity":26}	json	a few seconds ago
temperature	{"ph":8,"temperature":63,"humidity":37}	json	a few seconds ago
temperature	{"ph":9,"temperature":15,"humidity":39}	json	a few seconds ago
temperature	{"ph":5,"temperature":13,"humidity":25}	json	a few seconds ago

Below the table, a status box indicates '1 Simulation running'.

Web Application (User Interface):

