

WORK FLOW

Team ID	PNT2022TMID47935
Project Name	Real-time river water quality monitoring and control system

COMMUNICATION AMONG MIT APP, NODE-RED, IBM IOT WATSON AND PYTHON

Python code:

```
ibmiotpublishsubscribe 2.py - C:\Users\KANNANKARUPPAIAH\J\Desktop\ibm\ibmiotpublishsubscribe 2.py (3.7.4)
File Edit Format Run Options Window Help

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

#Provide your IBM Watson Device Credentials
organization = "ks8pt1"
deviceType = "ESP32"
deviceId = "149149"
authMethod = "token"
authToken = "123456789"

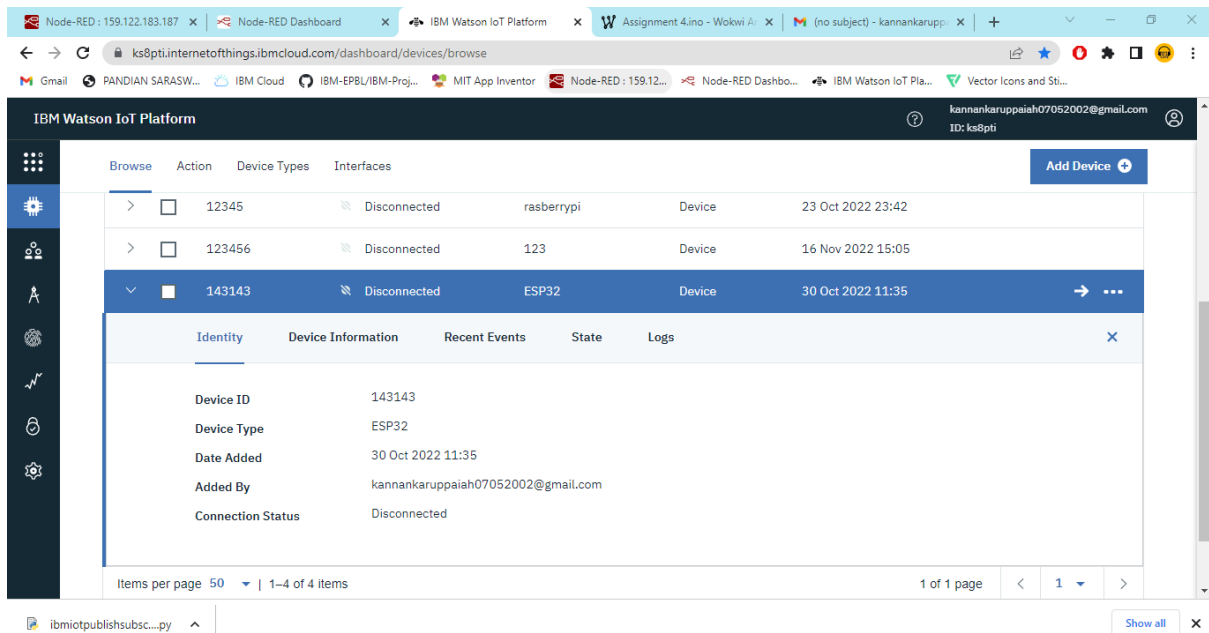
# Initialize GPIO

def myCommandCallback(cmd):
    print("Command received: %s" % cmd.data['command'])
    status=cmd.data['command']
    if status=="START":
        print ("Motor is Started")
    elif status=="STOP":
        print ("Motor is off state")
    elif status=="LEFT":
        print ("Left Side is Closed")
    elif status=="RIGHT":
        print ("Right Side is Closed")
    elif status=="FORWARD":
        print ("Message is Forward to the chief")
    else :
        print ("Send a proper command")

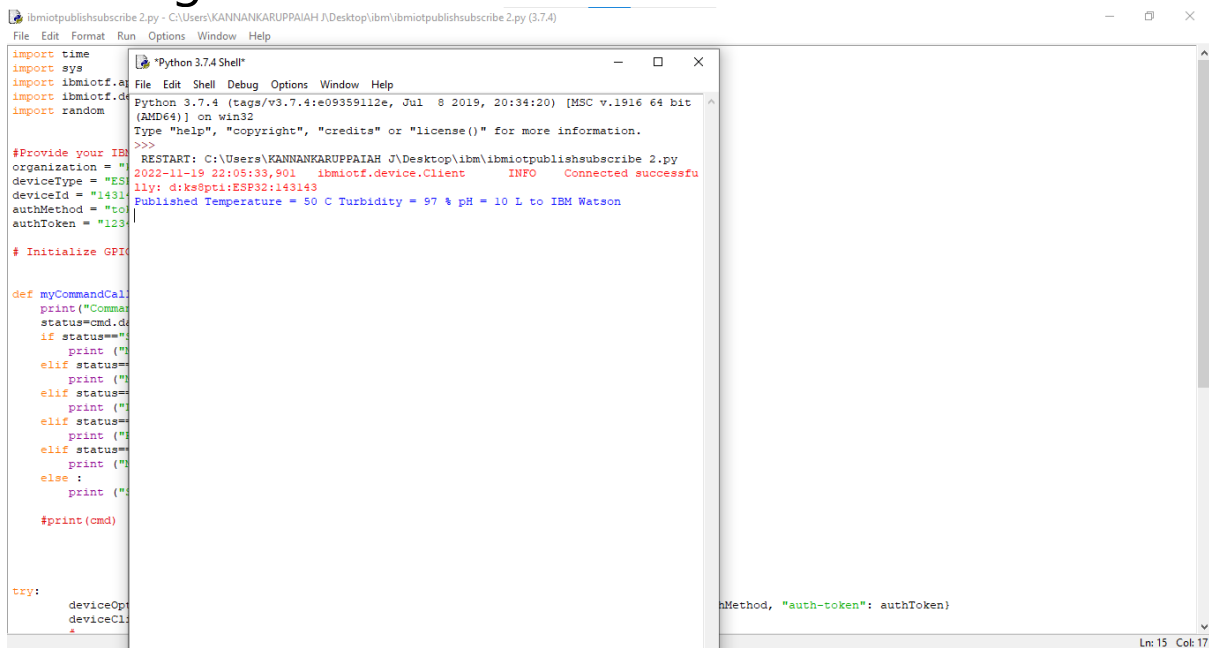
    #print(cmd)

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

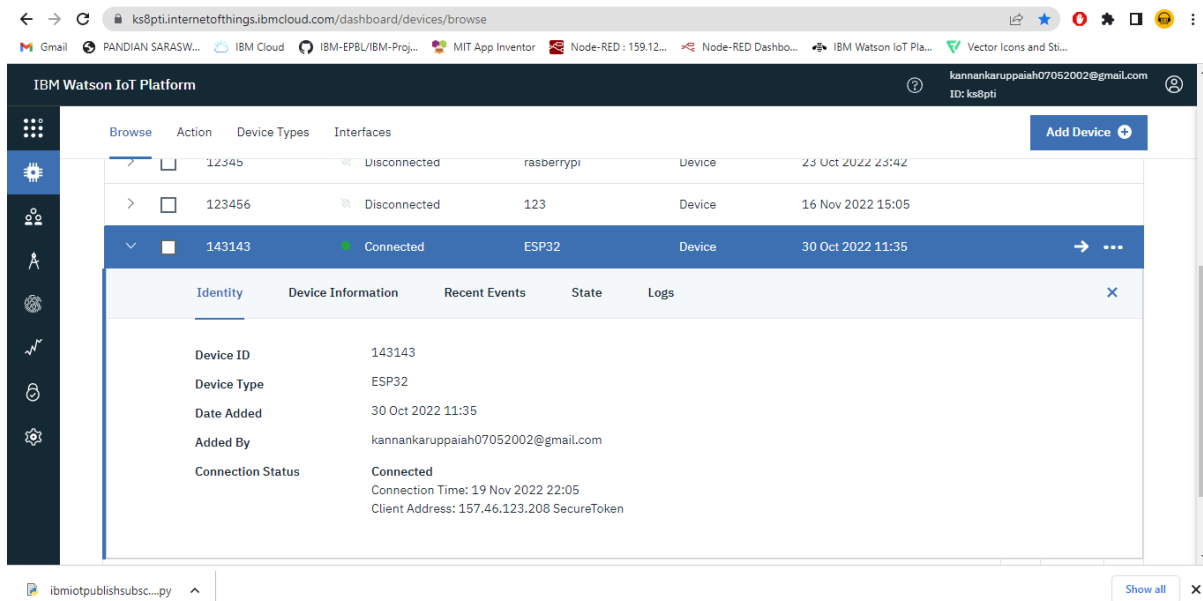
Before Run the python code, The IOT platform is disconnected



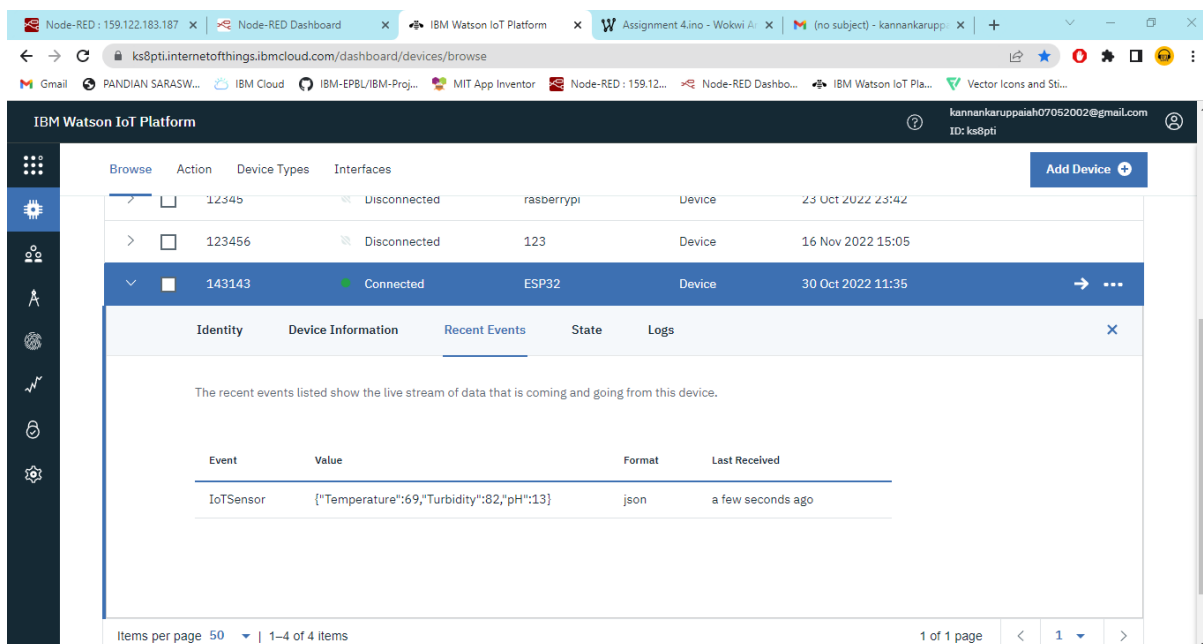
Run the Python code:
After running the python code the data's are showing in IDLE



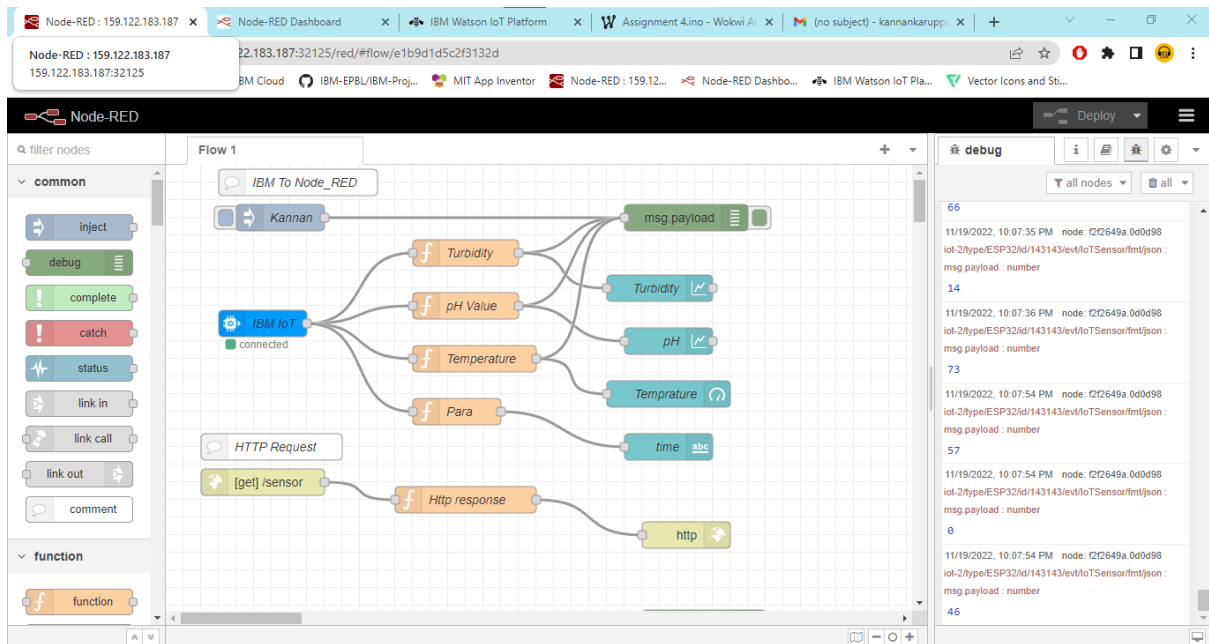
Now the IBM IoT Watson platform is connected



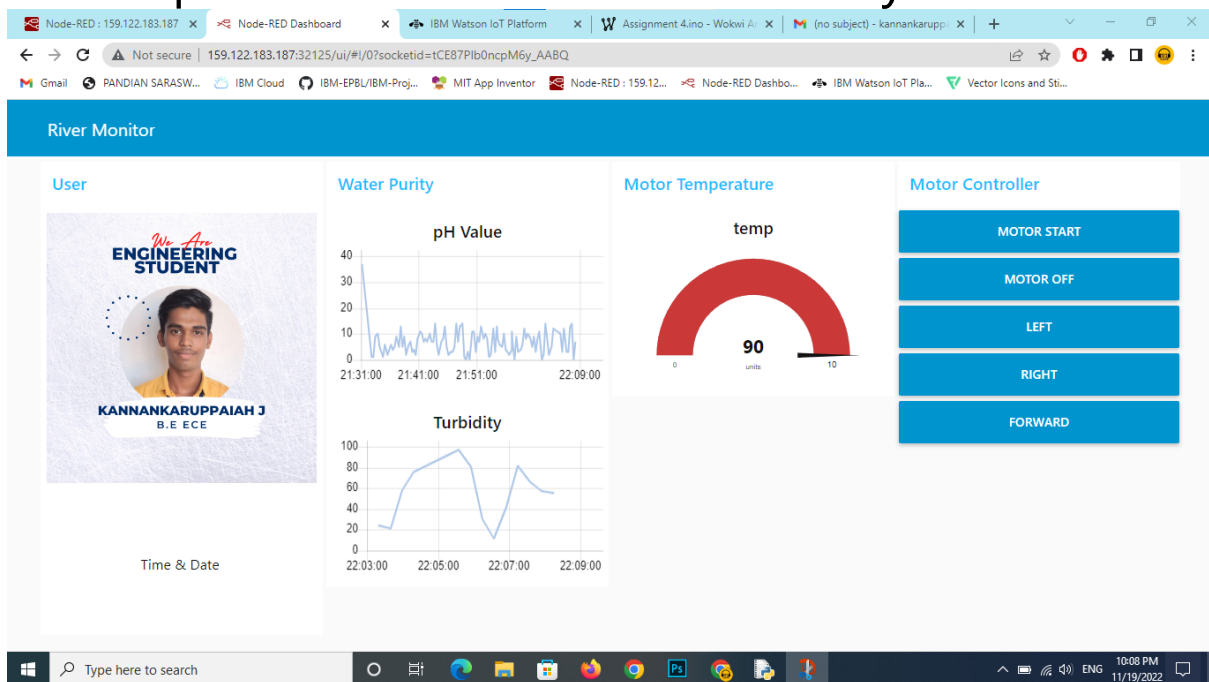
IoT Device ESP32 is connected with python code ,
Then the data's are collected and shown in recent events



The Node-RED is connected with the IBM IoT platform .
IBM IoT is pass the data to the Node-Red.
Node-RED is collected the all data and display in debug window



Node-RED Dashboard is Showing every data.
When we click the buttons in dashboard the result
will be publish both Node-RED and Python



Node-RED OUTPUT

The screenshot shows the Node-RED web interface. The flow diagram, titled 'Flow 1', includes an 'IBM IoT' node connected to four function nodes: 'Turbidity', 'pH Value', 'Temperature', and 'Para'. These function nodes are connected to corresponding output nodes: 'Turbidity', 'pH', 'Temperature', and 'time'. A 'msg.payload' node is also connected to the 'Turbidity' and 'pH' output nodes. Below the function nodes, there is an 'HTTP Request' node connected to an 'Http response' node, which is then connected to an 'http' node. The debug console on the right shows a series of messages, including 'msg.payload: number' and 'msg.payload: Object' with commands like 'START', 'STOP', 'LEFT', 'RIGHT', and 'FORWARD'.

Python OUTPUT

The screenshot shows a Python 3.7.4 shell window. The output of the script is as follows:

```
RESTART: C:\Users\KANNANKARUPPAIAH J\Desktop\ibm\ibmiotpublishsubscribe 2.py
2022-11-19 22:05:33,901 ibmiotf.device.Client INFO Connected successfully: dks8pti:ESP32:143143
Published Temperature = 50 C Turbidity = 97 % pH = 10 L to IBM Watson
Published Temperature = 74 C Turbidity = 81 % pH = 3 L to IBM Watson
Published Temperature = 32 C Turbidity = 30 % pH = 12 L to IBM Watson
Published Temperature = 27 C Turbidity = 12 % pH = 3 L to IBM Watson
Published Temperature = 97 C Turbidity = 42 % pH = 3 L to IBM Watson
Published Temperature = 69 C Turbidity = 82 % pH = 13 L to IBM Watson
Published Temperature = 73 C Turbidity = 66 % pH = 14 L to IBM Watson
Published Temperature = 46 C Turbidity = 57 % pH = 0 L to IBM Watson
Published Temperature = 90 C Turbidity = 55 % pH = 7 L to IBM Watson
Published Temperature = 41 C Turbidity = 35 % pH = 2 L to IBM Watson
Published Temperature = 13 C Turbidity = 46 % pH = 3 L to IBM Watson
Command received: START
Motor is Started
Command received: STOP
Motor is OFF state
Command received: LEFT
Left Side is Closed
Command received: RIGHT
Right Side is Closed
Command received: FORWARD
Message is Forward to the chief
Published Temperature = 39 C Turbidity = 85 % pH = 1 L to IBM Watson
```

This is my mobile app screen.

Its show the pH and Turbidity values of water and temperature of motor.

When I'm clicking the control buttons in this screen the result are publish in Node-RED and python .

10:09



VoLTE 4G 89

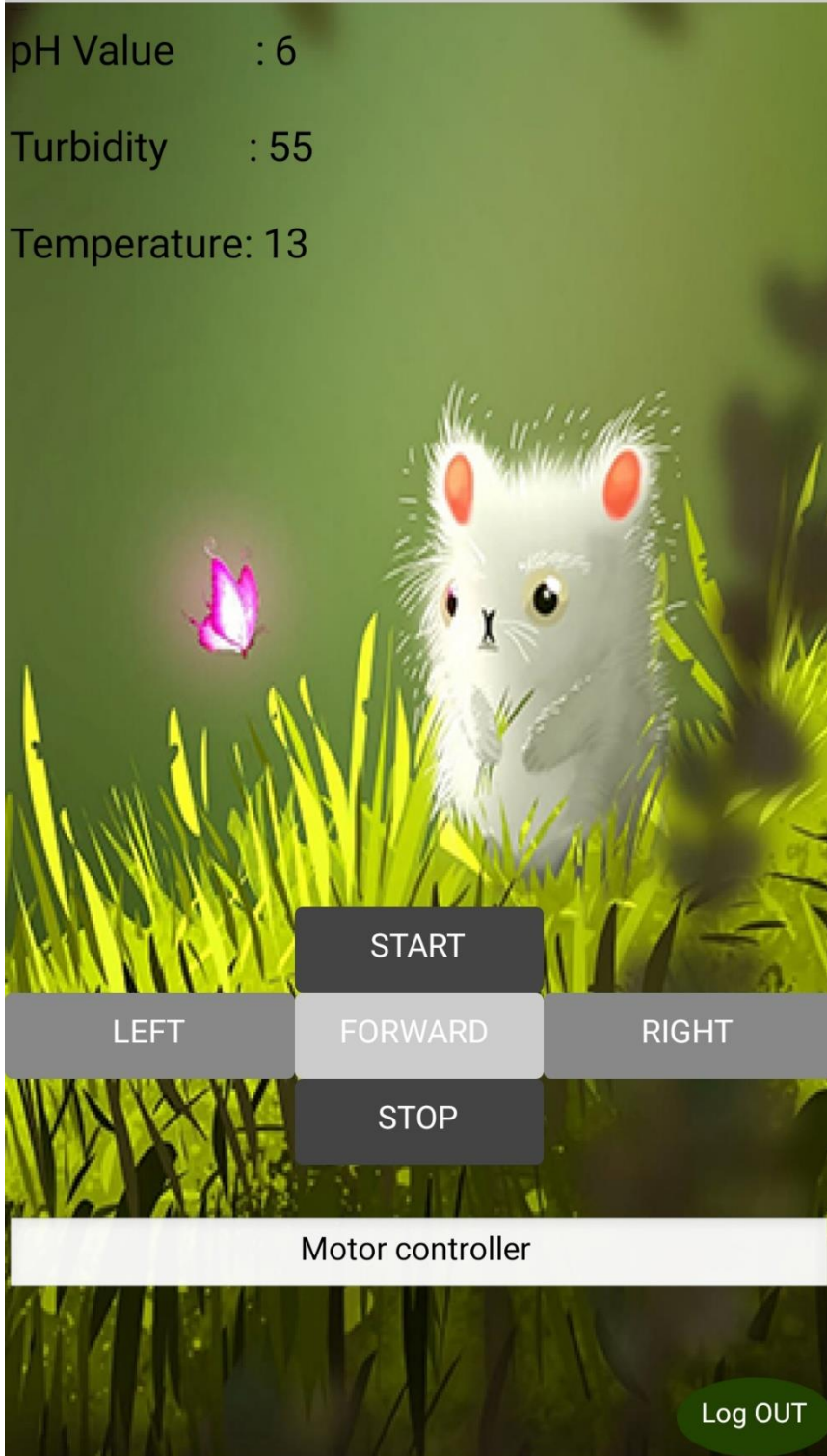
Real Time Water Quality Monitoring

MONITORING WINDOW

pH Value : 6

Turbidity : 55

Temperature: 13



START

LEFT

FORWARD

RIGHT

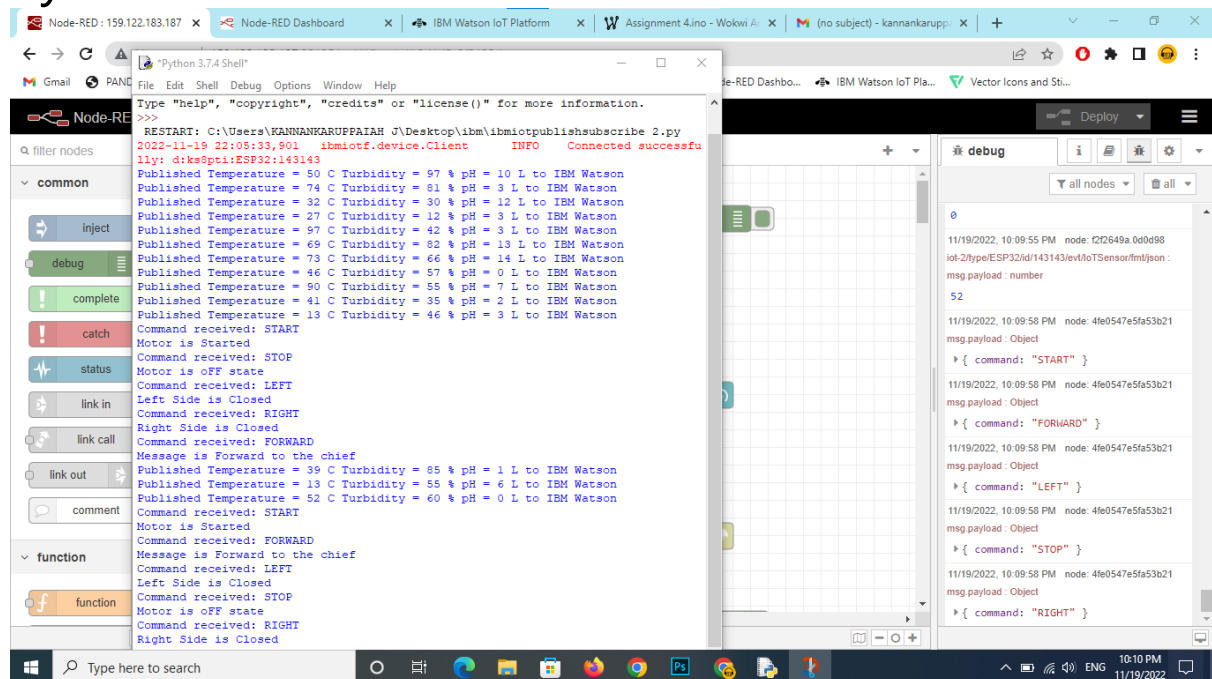
STOP

Motor controller

Log OUT

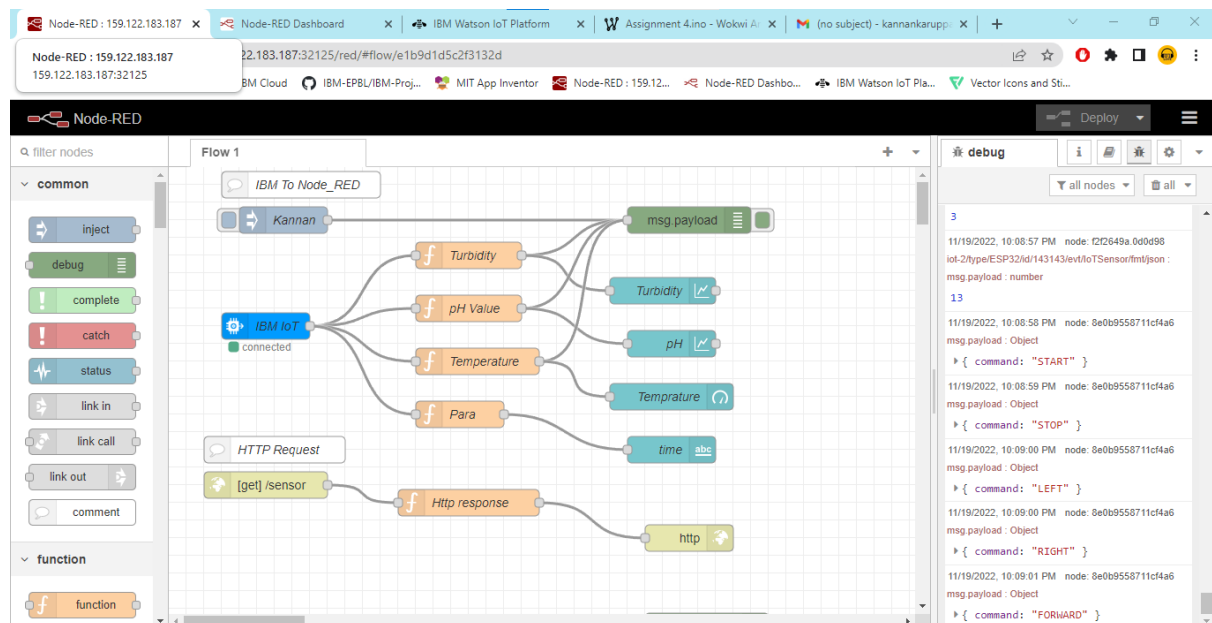


Python OUTPUT



```
>>>
Type "help", "copyright", "credits" or "license()" for more information.
>>>
RESTART: C:\Users\KANNANKARUPPAIAH J\Desktop\ibm\ibmiotpublishsubscribe 2.py
2022-11-19 22:05:33,901 ibmiotf.device.Client INFO Connected successfully: dks0pti:ESP32:143143
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Published Temperature = 90 C Turbidity = 55 pH = 7 L to IBM Watson
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Command received: START
Motor is Started
Command received: STOP
Motor is oFF state
Command received: LEFT
Left Side is Closed
Command received: RIGHT
Right Side is Closed
Command received: FORWARD
Message is Forward to the chief
Published Temperature = 39 C Turbidity = 85 pH = 1 L to IBM Watson
Published Temperature = 13 C Turbidity = 55 pH = 3 L to IBM Watson
Published Temperature = 52 C Turbidity = 60 pH = 0 L to IBM Watson
Command received: START
Motor is Started
Command received: FORWARD
Message is Forward to the chief
Command received: LEFT
Left Side is Closed
Command received: STOP
Motor is oFF state
Command received: RIGHT
Right Side is Closed
```

Node-RED OUTPUT



```
11/19/2022, 10:08:57 PM node: f2d2649a.0d0d98
iot-2/type/ESP32/143143/ev4toTSensorfmltjson :
msg payload : number
13

11/19/2022, 10:08:58 PM node: 8e0b9558711c4a6
msg payload : Object
> { command: "START" }

11/19/2022, 10:08:59 PM node: 8e0b9558711c4a6
msg payload : Object
> { command: "STOP" }

11/19/2022, 10:09:00 PM node: 8e0b9558711c4a6
msg payload : Object
> { command: "LEFT" }

11/19/2022, 10:09:00 PM node: 8e0b9558711c4a6
msg payload : Object
> { command: "RIGHT" }

11/19/2022, 10:09:01 PM node: 8e0b9558711c4a6
msg payload : Object
> { command: "FORWARD" }
```