Project Development Phase
Project Development Delivery of Sprint 4

Date	13 November 2022
Team ID	PNT2022TMIDI3488
Project Name	Project - Signs with smart connectivity for Better road safety
Marks	8 Marks

Signs with smart connectivity for Better road safety

Objective :

>> Write a python code for print the random temperature, Road signs, Speed limit, Message

>> Simulate and Generate the data

>> Display the published data in IBM Watson IOT Platform

>> Connecting the Node-Red and OpenWeatherMap (Ex., Salem, IN)

>> Signs with smart connectivity for better road safety Project in Node-Red

>> Test cases in UI web page

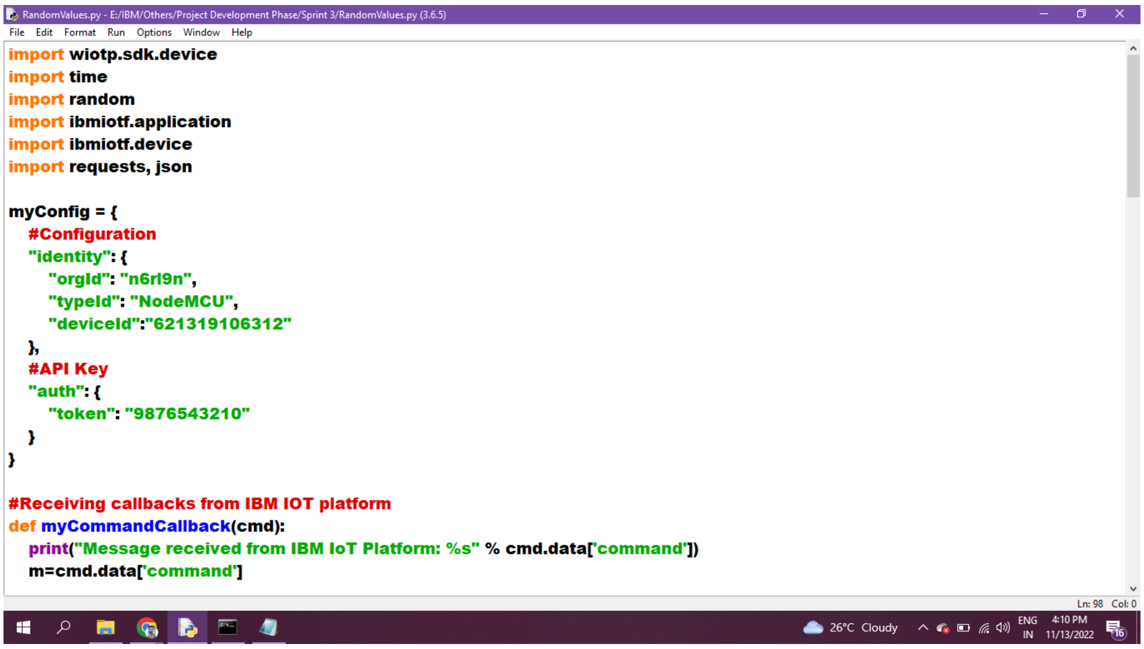
Code for print the random temperature, Road signs, Speed limit, Message :

(RandomValues.py)

```
import wiotp.sdk.device
import time
import random
import ibmiotf.application
import ibmiotf.device
import requests, json

myConfig = {
    #Configuration
    "identity": {
        "orgId": "n6rl9n",
        "typeId": "NodeMCU",
        "deviceId":"621319106312"
    },
    #API Key
    "auth": {
        "token": "9876543210"
    }
}

#Receiving callbacks from IBM IOT platform
def myCommandCallback(cmd):
    print("Message received from IBM IoT Platform: %s" % cmd.data['command'])
    m=cmd.data['command']

client = wiotp.sdk.device.DeviceClient(config=myConfig, logHandlers=None)
client.connect()
```

```
#OpenWeatherMap Credentials
BASE_URL = "https://api.openweathermap.org/data/2.5/weather?"
CITY = "Salem, IN"
URL = BASE_URL + "q=" + CITY + "&units=metric"+"&appid=" + "f58e4720c739a54c439aba9b05176839"

while True:
    response = requests.get(URL)
    if response.status_code == 200:
       data = response.json()
       main = data['main']
       temperature = main['temp']
       humidity = main['humidity']
       pressure = main['pressure']
       report = data['visibility']

       #messge part
       msg=random.randint(0,5)
       if msg==1:
           message="GO SLOW, SCHOOL ZONE AHEAD"
       elif msg==2:
           message="NEED HELP, POLICE STATION AHEAD"
       elif msg==3:
           message="EMERGENCY, HOSPITAL NEARBY"
       elif msg==4:
           message="DINE IN, RESTAURENT AVAILABLE"
       elif msg==5:
           message="PETROL BUNK NEARBY"
       else:
           message=""

        #Speed Limit part
       speed=random.randint(0,150)
       if speed>=100:
           speedMsg=" Limit Exceeded"
       elif speed>=60 and speed<100:
           speedMsg="Moderate"
       else:
            speedMsg="Slow"

        #Diversion part
       sign=random.randint(0,5)
       if sign==1:
           signMsg="Right Diversion"
       elif sign==2:
           signMsg="Speed Breaker"
       elif sign==3:
           signMsg="Left Diversion"
       elif sign==4:
           signmsg="U Turn"
        else:
             signMsg=""

         #Visibility
        if temperature < 24:
            visibility="Fog Ahead, Drive Slow"
        elif temperature < 20:
            visibility="Bad Weather"
        else:
            visibility="Clear Weather"
     else:
        print("Error in the HTTP request")
     myData={'Temperature':temperature, 'Message':message, 'Sign':signMsg, 'Speed':speedMsg,
 'Visibility':visibility}
     client.publishEvent(eventId="status", msgFormat="json", data=myData, qos=0, onPublish=None)
 #PUBLISHING TO IOT WATSON
     print("Published data Successfully: ", myData)
     print("-------------------------------------------------------------------------------------
 -------------------------------------------------------------------------------------------
 -----------------------------------------")
     client.commandCallback = myCommandCallback
     time.sleep(5)
 client.disconnect()
```

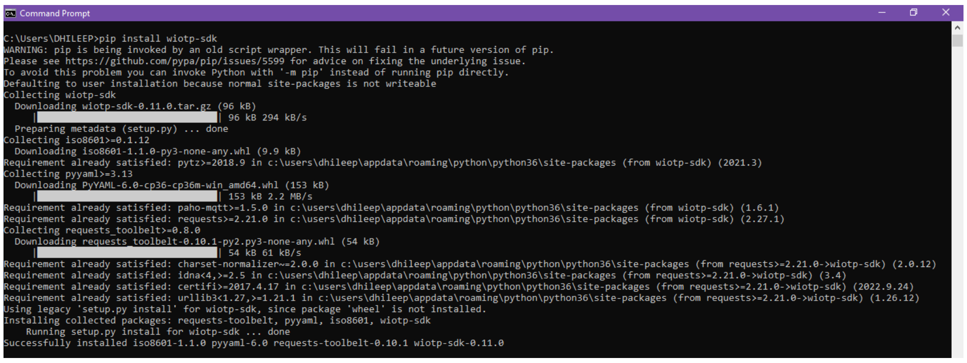
Python Simulation :



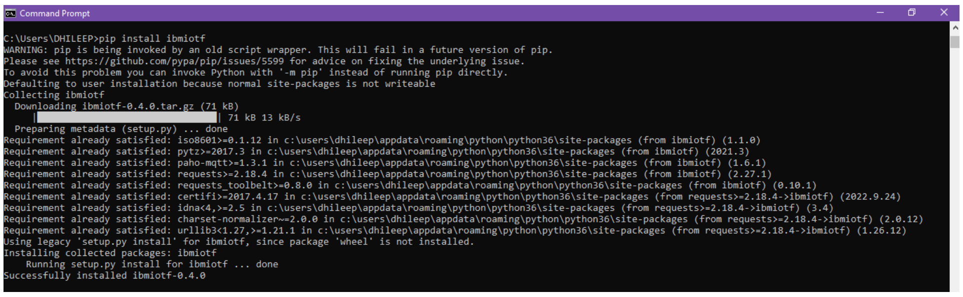
```
import wiotp.sdk.device
import time
import random
import ibmiotf.application
import ibmiotf.device
import requests, json

myConfig = {
  #Configuration
  "identity": {
     "orgId": "n6rl9n",
     "typeId": "NodeMCU",
     "deviceId":"621319106312"
  },
  #API Key
  "auth": {
     "token": "9876543210"
  }
}

#Receiving callbacks from IBM IOT platform
def myCommandCallback(cmd):
  print("Message received from IBM IoT Platform: %s" % cmd.data['command'])
  m=cmd.data['command']
```

RandomValues.py - E:/IBM/Others/Project Development Phase/Sprint 3/RandomValues.py (3.6.5)
File Edit Format Run Options Window Help
Ln: 98 Col: 0
26°C Cloudy
ENG IN
4:10 PM
11/13/2022

Import wiotp-sdk & ibmiotf :

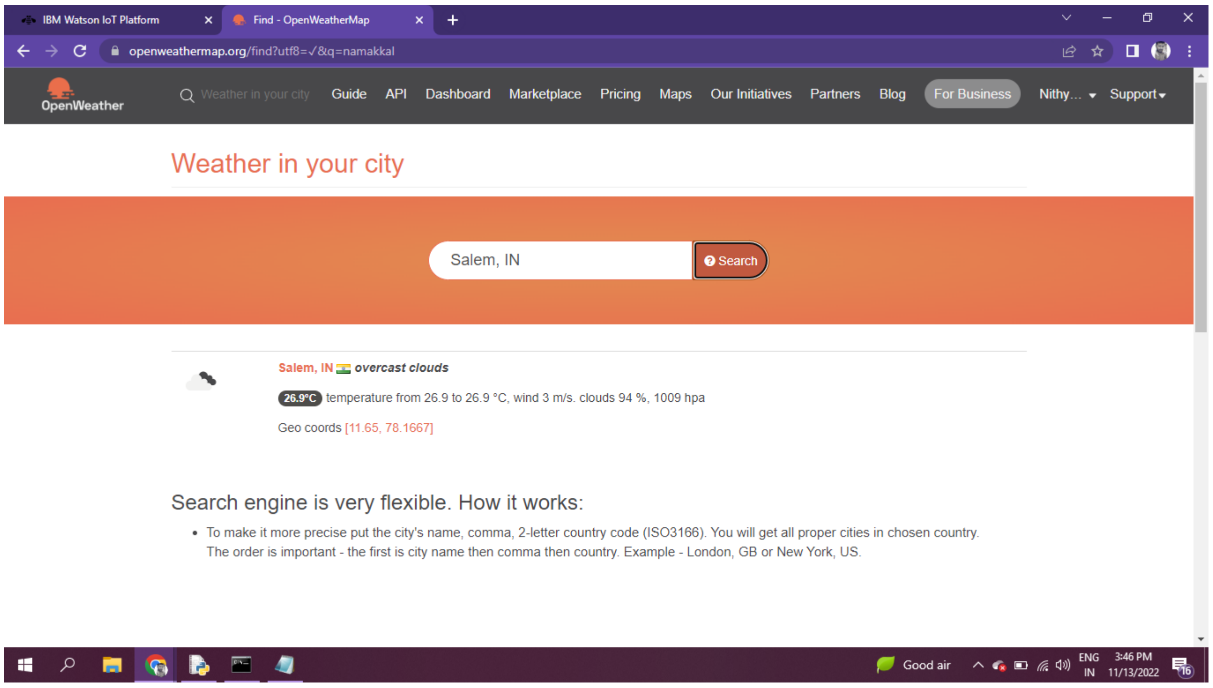


```
C:\Users\DHILEEP>pip install wiotp-sdk
WARNING: pip is being invoked by an old script wrapper. This will fail in a future version of pip.
Please see https://github.com/pypa/pip/issues/5599 for advice on fixing the underlying issue.
To avoid this problem you can invoke Python with '-m pip' instead of running pip directly.
Defaulting to user installation because normal site-packages is not writeable
Collecting wiotp-sdk
  Downloading wiotp-sdk-0.11.0.tar.gz (96 kB)
     |████████████████████████████████| 96 kB 294 kB/s
  Preparing metadata (setup.py) ... done
Collecting iso8601>=0.1.12
  Downloading iso8601-1.1.0-py3-none-any.whl (9.9 kB)
Requirement already satisfied: pytz>=2018.9 in c:\users\dhileep\appdata\roaming\python\python36\site-packages (from wiotp-sdk) (2021.3)
Collecting pyyaml>=3.13
  Downloading PyYAML-6.0-cp36-cp36m-win_amd64.whl (153 kB)
     |████████████████████████████████| 153 kB 2.2 MB/s
Requirement already satisfied: paho-mqtt>=1.5.0 in c:\users\dhileep\appdata\roaming\python\python36\site-packages (from wiotp-sdk) (1.6.1)
Requirement already satisfied: requests>=2.21.0 in c:\users\dhileep\appdata\roaming\python\python36\site-packages (from wiotp-sdk) (2.27.1)
Collecting requests_toolbelt>=0.8.0
  Downloading requests_toolbelt-0.10.1-py2.py3-none-any.whl (54 kB)
     |████████████████████████████████| 54 kB 61 kB/s
Requirement already satisfied: charset-normalizer~=2.0.0 in c:\users\dhileep\appdata\roaming\python\python36\site-packages (from requests>=2.21.0->wiotp-sdk) (2.0.12)
Requirement already satisfied: idna<4,>=2.5 in c:\users\dhileep\appdata\roaming\python\python36\site-packages (from requests>=2.21.0->wiotp-sdk) (3.4)
Requirement already satisfied: certifi>=2017.4.17 in c:\users\dhileep\appdata\roaming\python\python36\site-packages (from requests>=2.21.0->wiotp-sdk) (2022.9.24)
Requirement already satisfied: urllib3<1.27,>=1.21.1 in c:\users\dhileep\appdata\roaming\python\python36\site-packages (from requests>=2.21.0->wiotp-sdk) (1.26.12)
Using legacy 'setup.py install' for wiotp-sdk, since package 'wheel' is not installed.
Installing collected packages: requests-toolbelt, pyyaml, iso8601, wiotp-sdk
    Running setup.py install for wiotp-sdk ... done
Successfully installed iso8601-1.1.0 pyyaml-6.0 requests-toolbelt-0.10.1 wiotp-sdk-0.11.0
```



```
C:\Users\DHILEEP>pip install ibmiotf
WARNING: pip is being invoked by an old script wrapper. This will fail in a future version of pip.
Please see https://github.com/pypa/pip/issues/5599 for advice on fixing the underlying issue.
To avoid this problem you can invoke Python with '-m pip' instead of running pip directly.
Defaulting to user installation because normal site-packages is not writeable
Collecting ibmiotf
  Downloading ibmiotf-0.4.0.tar.gz (71 kB)
     |████████████████████████████████| 71 kB 13 kB/s
  Preparing metadata (setup.py) ... done
Requirement already satisfied: iso8601>=0.1.12 in c:\users\dhileep\appdata\roaming\python\python36\site-packages (from ibmiotf) (1.1.0)
Requirement already satisfied: pytz>=2017.3 in c:\users\dhileep\appdata\roaming\python\python36\site-packages (from ibmiotf) (2021.3)
Requirement already satisfied: paho-mqtt>=1.3.1 in c:\users\dhileep\appdata\roaming\python\python36\site-packages (from ibmiotf) (1.6.1)
Requirement already satisfied: requests>=2.18.4 in c:\users\dhileep\appdata\roaming\python\python36\site-packages (from ibmiotf) (2.27.1)
Requirement already satisfied: requests_toolbelt>=0.8.0 in c:\users\dhileep\appdata\roaming\python\python36\site-packages (from ibmiotf) (0.10.1)
Requirement already satisfied: certifi>=2017.4.17 in c:\users\dhileep\appdata\roaming\python\python36\site-packages (from requests>=2.18.4->ibmiotf) (2022.9.24)
Requirement already satisfied: idna<4,>=2.5 in c:\users\dhileep\appdata\roaming\python\python36\site-packages (from requests>=2.18.4->ibmiotf) (3.4)
Requirement already satisfied: charset-normalizer~=2.0.0 in c:\users\dhileep\appdata\roaming\python\python36\site-packages (from requests>=2.18.4->ibmiotf) (2.0.12)
Requirement already satisfied: urllib3<1.27,>=1.21.1 in c:\users\dhileep\appdata\roaming\python\python36\site-packages (from requests>=2.18.4->ibmiotf) (1.26.12)
Using legacy 'setup.py install' for ibmiotf, since package 'wheel' is not installed.
Installing collected packages: ibmiotf
    Running setup.py install for ibmiotf ... done
Successfully installed ibmiotf-0.4.0
```

OpenWeatherMap - (Ex., Salem, IN) :



Weather in your city

Salem, IN *overcast clouds*

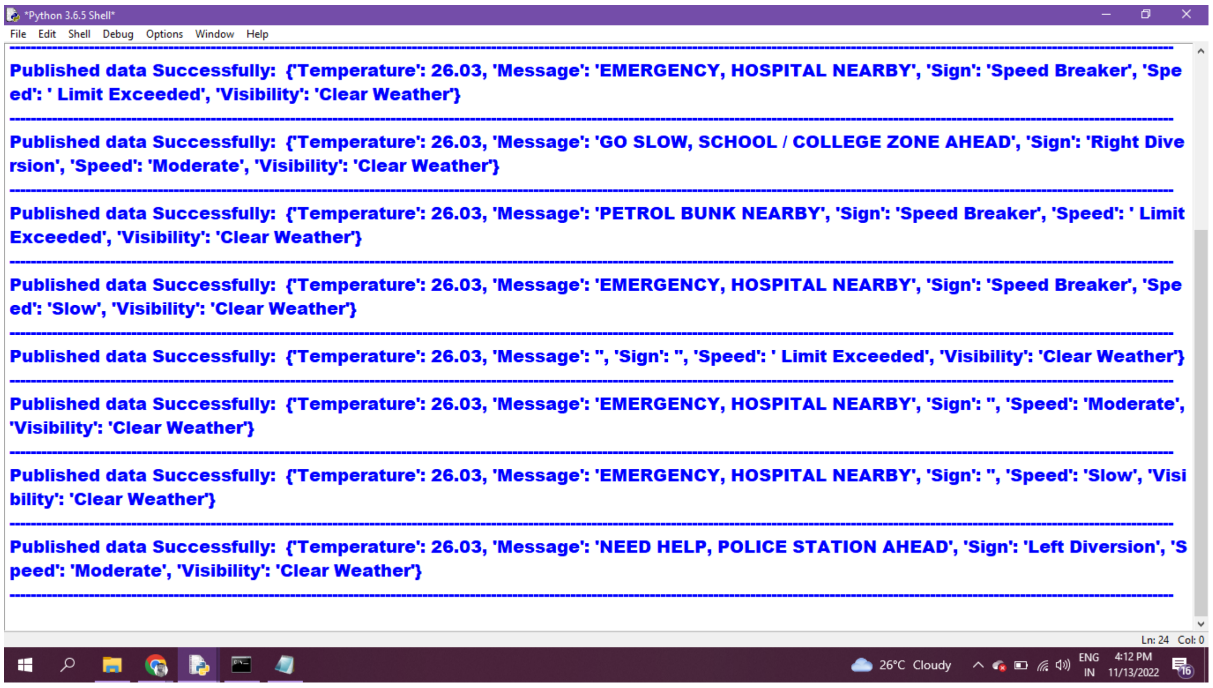
26.9°C temperature from 26.9 to 26.9 °C, wind 3 m/s. clouds 94 %, 1009 hpa

Geo coords [11.65, 78.1667]

Search engine is very flexible. How it works:

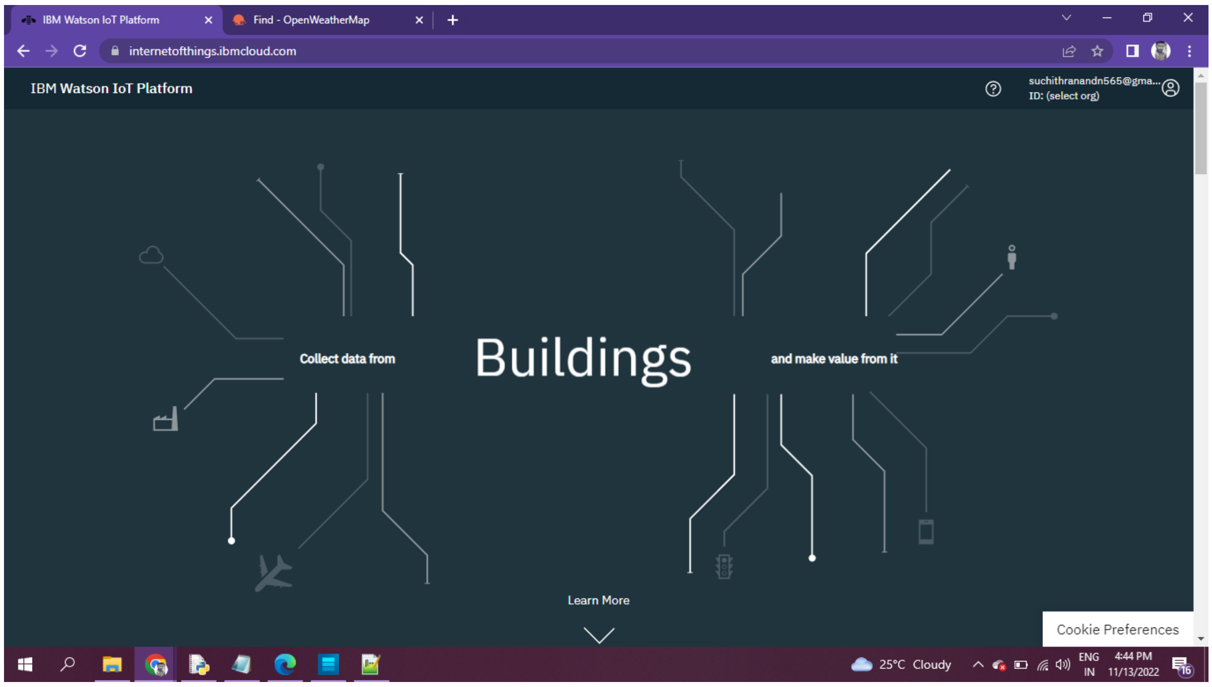
- To make it more precise put the city's name, comma, 2-letter country code (ISO3166). You will get all proper cities in chosen country. The order is important - the first is city name then comma then country. Example - London, GB or New York, US.

Python IDLE Output :

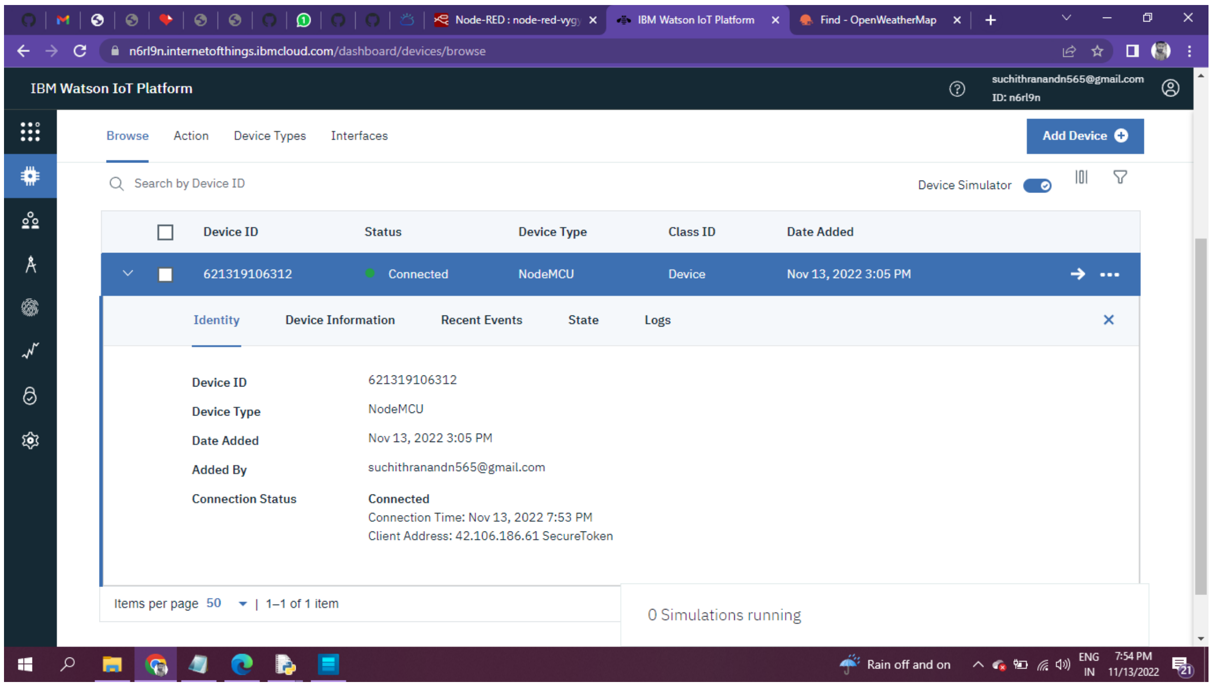


```
------------------------------------------------------------------------------------------------
Published data Successfully:  {'Temperature': 26.03, 'Message': 'EMERGENCY, HOSPITAL NEARBY', 'Sign': 'Speed Breaker', 'Spe
ed': ' Limit Exceeded', 'Visibility': 'Clear Weather'}
------------------------------------------------------------------------------------------------
Published data Successfully:  {'Temperature': 26.03, 'Message': 'GO SLOW, SCHOOL / COLLEGE ZONE AHEAD', 'Sign': 'Right Dive
rsion', 'Speed': 'Moderate', 'Visibility': 'Clear Weather'}
------------------------------------------------------------------------------------------------
Published data Successfully:  {'Temperature': 26.03, 'Message': 'PETROL BUNK NEARBY', 'Sign': 'Speed Breaker', 'Speed': ' Limit
Exceeded', 'Visibility': 'Clear Weather'}
------------------------------------------------------------------------------------------------
Published data Successfully:  {'Temperature': 26.03, 'Message': 'EMERGENCY, HOSPITAL NEARBY', 'Sign': 'Speed Breaker', 'Spe
ed': 'Slow', 'Visibility': 'Clear Weather'}
------------------------------------------------------------------------------------------------
Published data Successfully:  {'Temperature': 26.03, 'Message': '', 'Sign': '', 'Speed': ' Limit Exceeded', 'Visibility': 'Clear Weather'}
------------------------------------------------------------------------------------------------
Published data Successfully:  {'Temperature': 26.03, 'Message': 'EMERGENCY, HOSPITAL NEARBY', 'Sign': '', 'Speed': 'Moderate',
'Visibility': 'Clear Weather'}
------------------------------------------------------------------------------------------------
Published data Successfully:  {'Temperature': 26.03, 'Message': 'EMERGENCY, HOSPITAL NEARBY', 'Sign': '', 'Speed': 'Slow', 'Visi
bility': 'Clear Weather'}
------------------------------------------------------------------------------------------------
Published data Successfully:  {'Temperature': 26.03, 'Message': 'NEED HELP, POLICE STATION AHEAD', 'Sign': 'Left Diversion', 'S
peed': 'Moderate', 'Visibility': 'Clear Weather'}
------------------------------------------------------------------------------------------------
```

IBM Watson IOT Platform :



IBM Watson IOT Platform - Device Creation :



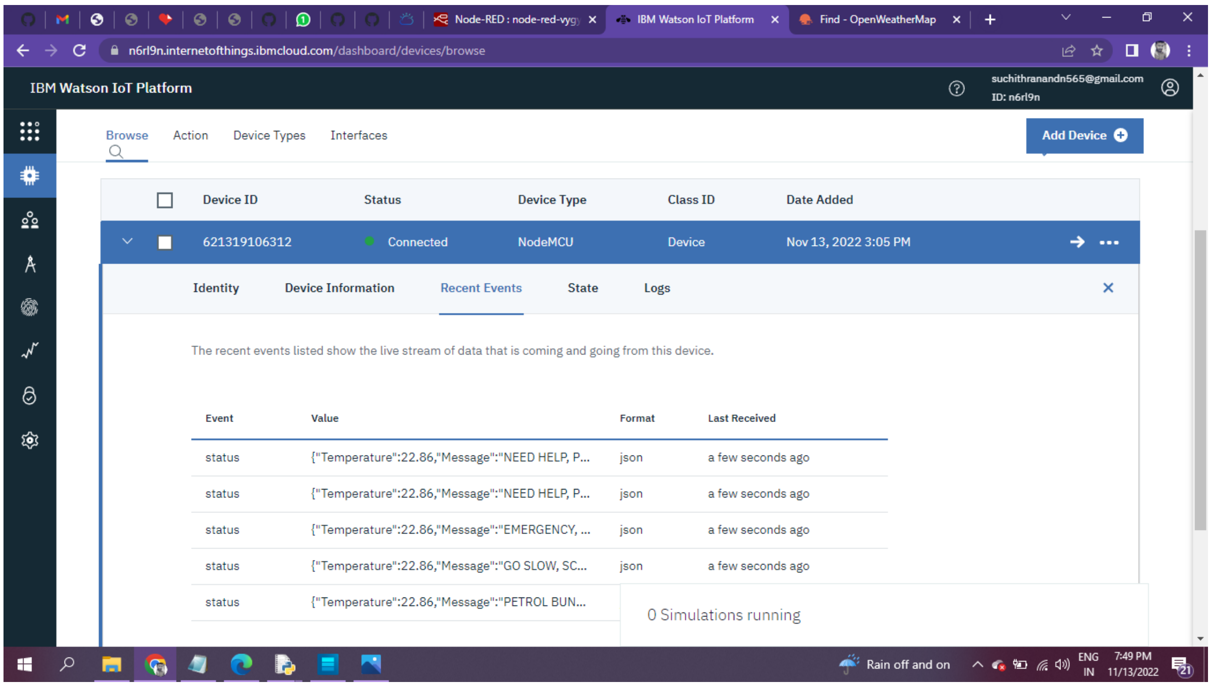
Device ID	Status	Device Type	Class ID	Date Added
621319106312	Connected	NodeMCU	Device	Nov 13, 2022 3:05 PM

Device ID	621319106312
Device Type	NodeMCU
Date Added	Nov 13, 2022 3:05 PM
Added By	suchithranandn565@gmail.com
Connection Status	Connected Connection Time: Nov 13, 2022 7:53 PM Client Address: 42.106.186.61 SecureToken

Items per page 50 | 1–1 of 1 item

0 Simulations running

IBM Watson IOT Platform - Display the published data :



IBM Watson IoT Platform

Device ID: 621319106312 | Status: Connected | Device Type: NodeMCU | Class ID: Device | Date Added: Nov 13, 2022 3:05 PM

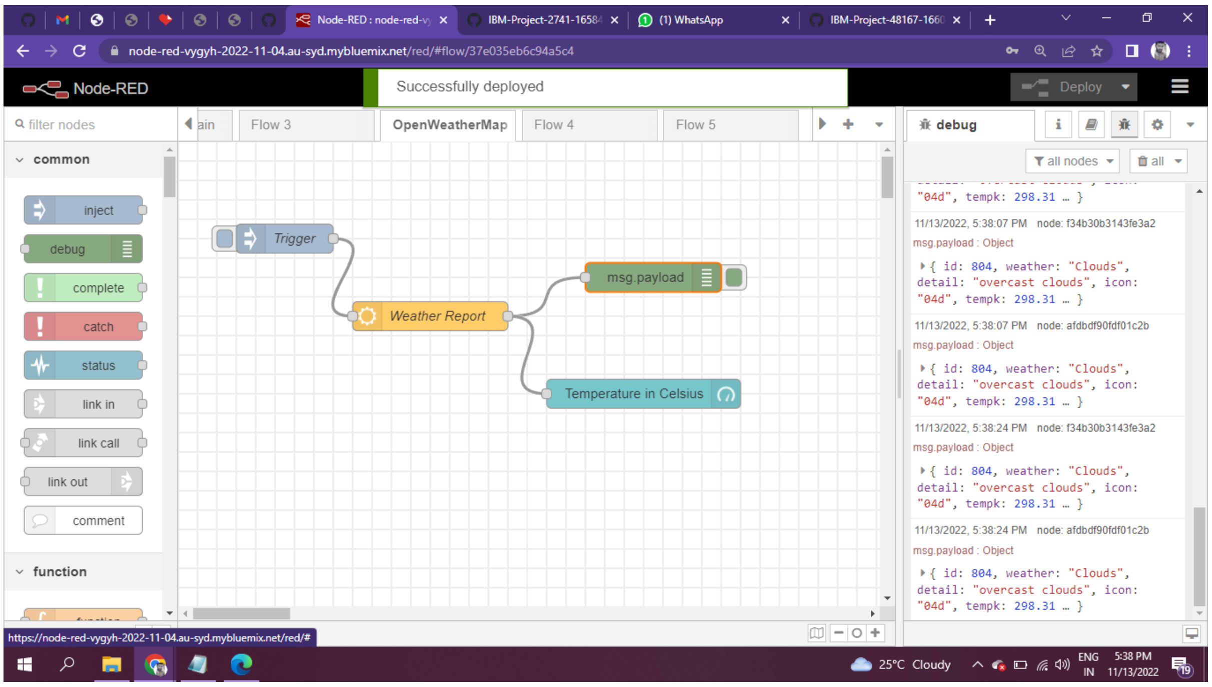
Recent Events

The recent events listed show the live stream of data that is coming and going from this device.

Event	Value	Format	Last Received
status	{"Temperature":22.86,"Message":"NEED HELP, P...	json	a few seconds ago
status	{"Temperature":22.86,"Message":"NEED HELP, P...	json	a few seconds ago
status	{"Temperature":22.86,"Message":"EMERGENCY, ...	json	a few seconds ago
status	{"Temperature":22.86,"Message":"GO SLOW, SC...	json	a few seconds ago
status	{"Temperature":22.86,"Message":"PETROL BUN...		

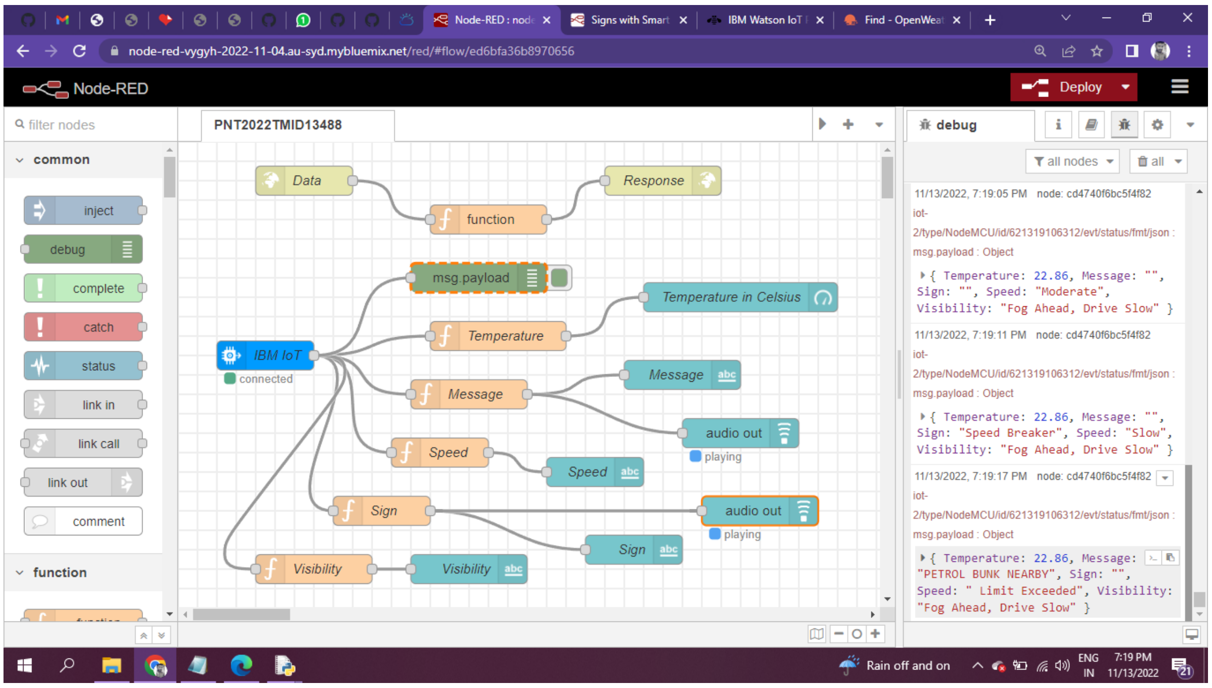
0 Simulations running

Connecting the Node-Red and OpenWeatherMap (Ex., Salem, IN) :



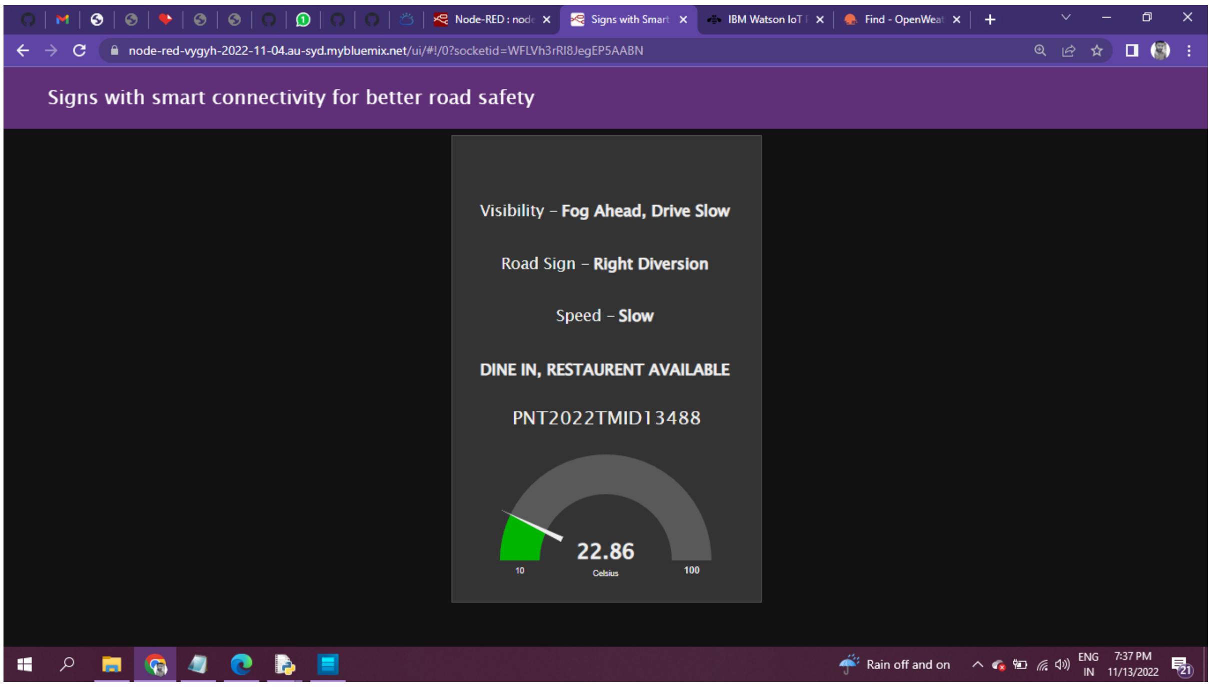
```
"04d", tempk: 298.31 … }
11/13/2022, 5:38:07 PM   node: f34b30b3143fe3a2
msg.payload : Object
▸{ id: 804, weather: "Clouds",
detail: "overcast clouds", icon:
"04d", tempk: 298.31 … }
11/13/2022, 5:38:07 PM   node: afdbdf90fdf01c2b
msg.payload : Object
▸{ id: 804, weather: "Clouds",
detail: "overcast clouds", icon:
"04d", tempk: 298.31 … }
11/13/2022, 5:38:24 PM   node: f34b30b3143fe3a2
msg.payload : Object
▸{ id: 804, weather: "Clouds",
detail: "overcast clouds", icon:
"04d", tempk: 298.31 … }
11/13/2022, 5:38:24 PM   node: afdbdf90fdf01c2b
msg.payload : Object
▸{ id: 804, weather: "Clouds",
detail: "overcast clouds", icon:
"04d", tempk: 298.31 … }
```

Signs with smart connectivity for better road safety - Node-Red :



```
11/13/2022, 7:19:05 PM   node: cd4740f6bc5f4f82
iot-2/type/NodeMCU/id/621319106312/evt/status/fmt/json :
msg.payload : Object
{ Temperature: 22.86, Message: "", Sign: "", Speed: "Moderate", Visibility: "Fog Ahead, Drive Slow" }
11/13/2022, 7:19:11 PM   node: cd4740f6bc5f4f82
iot-2/type/NodeMCU/id/621319106312/evt/status/fmt/json :
msg.payload : Object
{ Temperature: 22.86, Message: "", Sign: "Speed Breaker", Speed: "Slow", Visibility: "Fog Ahead, Drive Slow" }
11/13/2022, 7:19:17 PM   node: cd4740f6bc5f4f82
iot-2/type/NodeMCU/id/621319106312/evt/status/fmt/json :
msg.payload : Object
{ Temperature: 22.86, Message: "PETROL BUNK NEARBY", Sign: "", Speed: " Limit Exceeded", Visibility: "Fog Ahead, Drive Slow" }
```

Test Case - 1 :



Signs with smart connectivity for better road safety

Visibility – **Fog Ahead, Drive Slow**

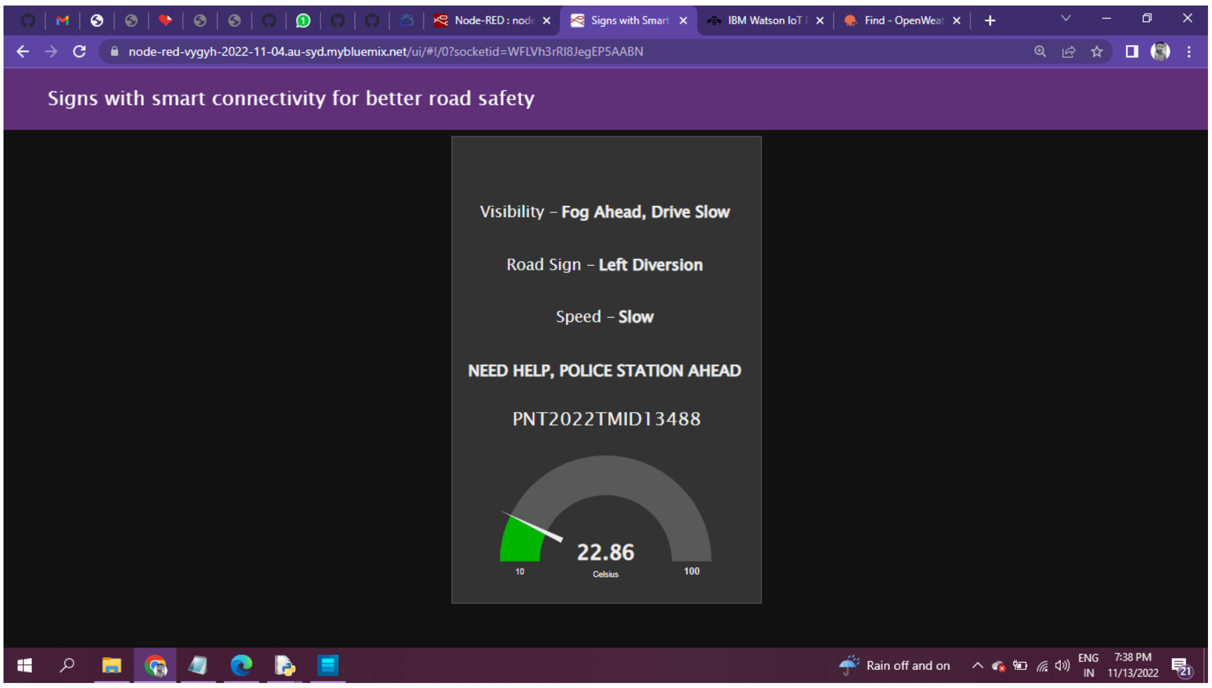
Road Sign – **Right Diversion**

Speed – **Slow**

DINE IN, RESTAURANT AVAILABLE

PNT2022TMID13488

Test Case - 2 :


Signs with smart connectivity for better road safety

Visibility – **Fog Ahead, Drive Slow**

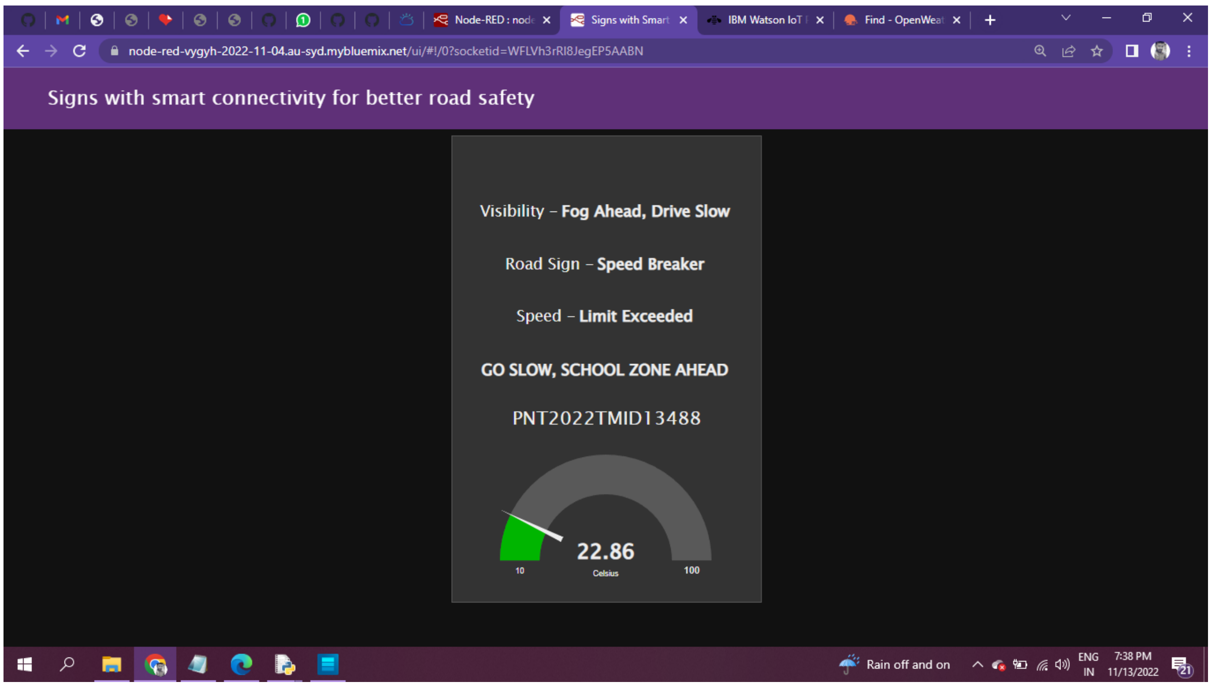
Road Sign – **Left Diversion**

Speed – **Slow**

NEED HELP, POLICE STATION AHEAD

PNT2022TMID13488

Test Case - 3 :


Signs with smart connectivity for better road safety

Visibility – **Fog Ahead, Drive Slow**

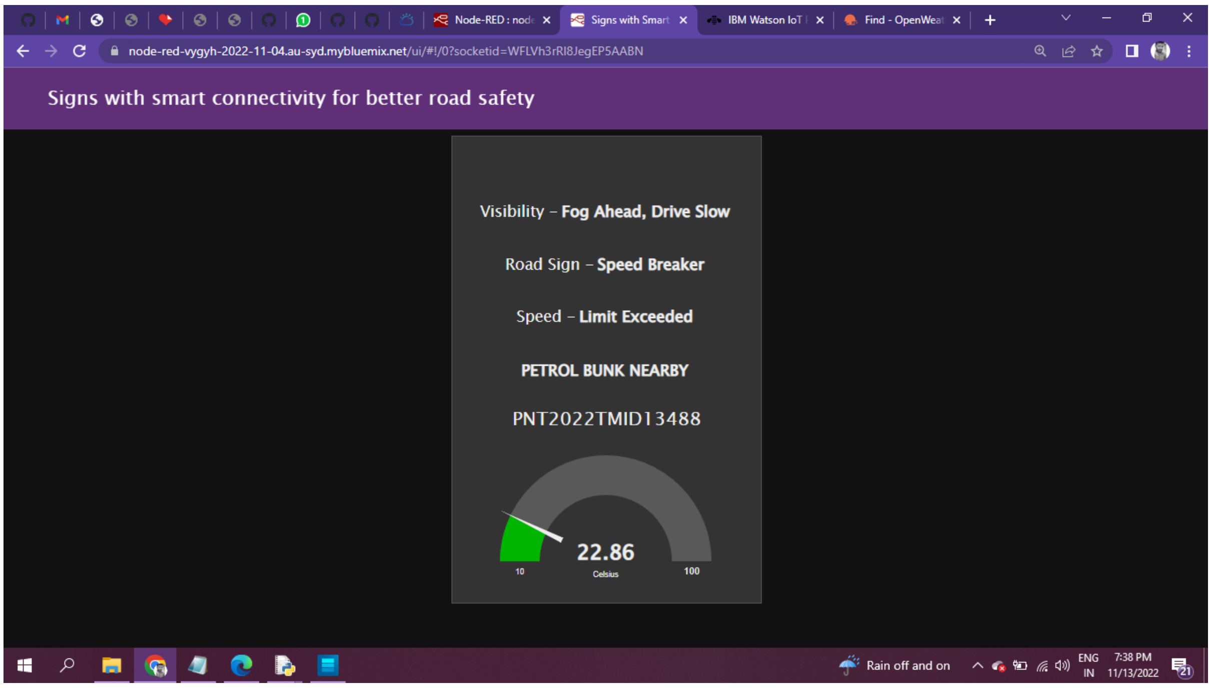
Road Sign – **Speed Breaker**

Speed – **Limit Exceeded**

GO SLOW, SCHOOL ZONE AHEAD

PNT2022TMID13488

Test Case - 4 :



node-red-vygyh-2022-11-04.au-syd.mybluemix.net/ui/#!/0?socketid=WFLVh3rRI8JegEP5AABN

Signs with smart connectivity for better road safety

Visibility – **Fog Ahead, Drive Slow**

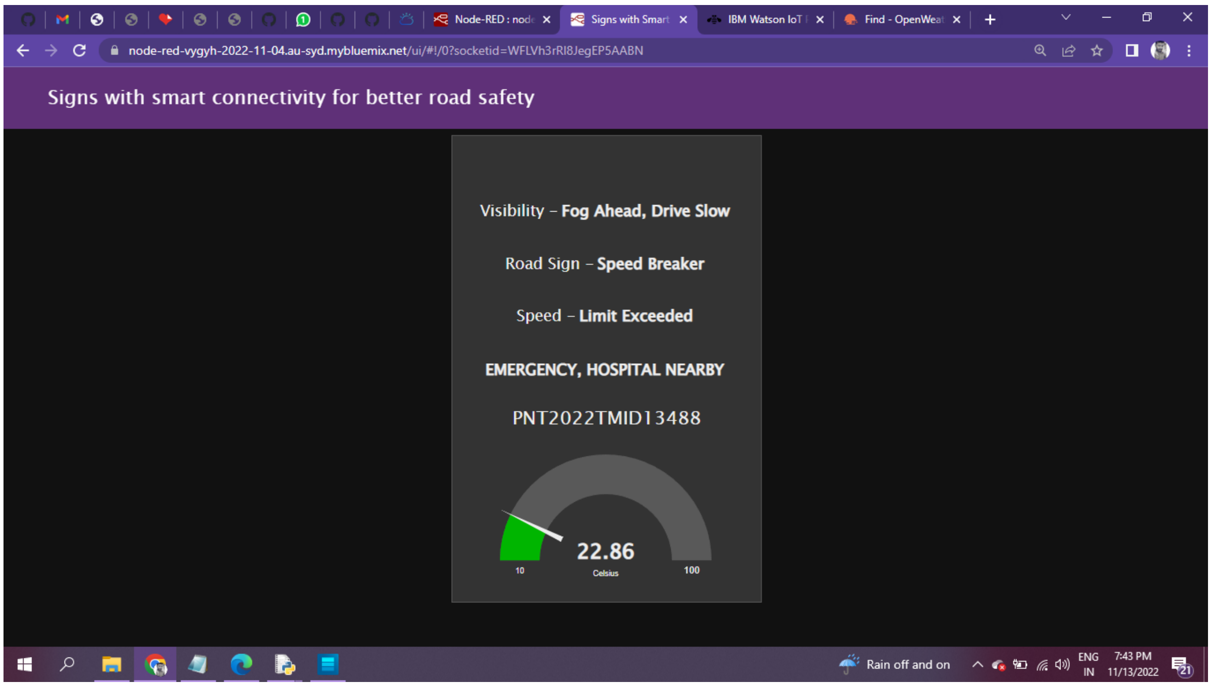
Road Sign – **Speed Breaker**

Speed – **Limit Exceeded**

PETROL BUNK NEARBY

PNT2022TMID13488

Test Case - 5 :



node-red-vygyh-2022-11-04.au-syd.mybluemix.net/ui/#!/0?socketid=WFLVh3rRI8JegEP5AABN

Signs with smart connectivity for better road safety

Visibility – **Fog Ahead, Drive Slow**

Road Sign – **Speed Breaker**

Speed – **Limit Exceeded**

EMERGENCY, HOSPITAL NEARBY

PNT2022TMID13488