

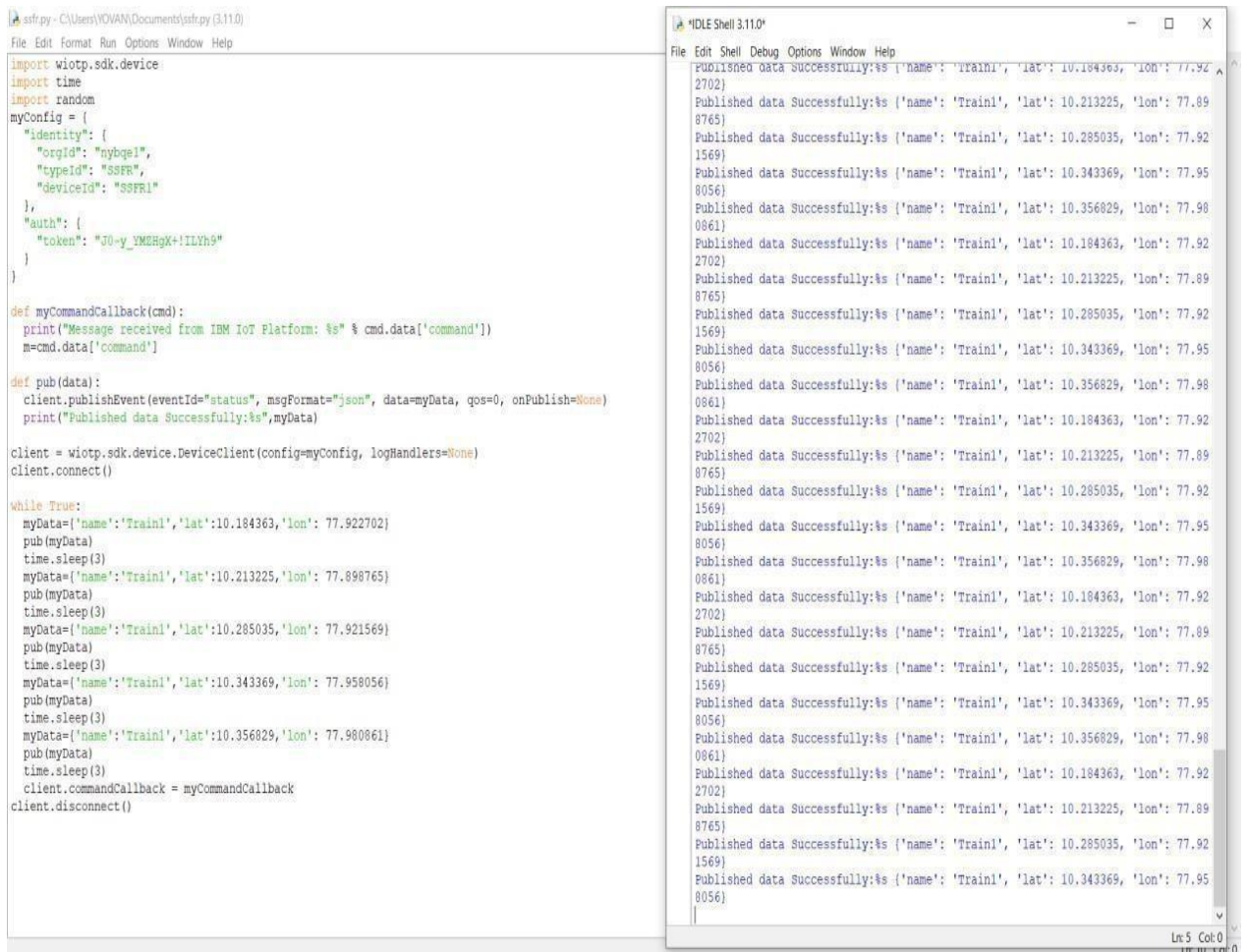
SMART SOLUTIONS FOR RAILWAYS:

TESTING OF WEB UI

Location Tracking:

- The python code for detecting the location of the train is made to Run.
- The live status of the train is updated in the IBM Watson IoT Platform and it is further used by the node red application.
- The location is shown in the map via the Node red UI.

1)



The image shows a Python script in a text editor and its execution output in a terminal window.

Python Script (Left Window):

```
import wiotp.sdk.device
import time
import random

myConfig = {
    "identity": {
        "orgId": "mybgel",
        "typeId": "SSFR",
        "deviceId": "SSFR1"
    },
    "auth": {
        "token": "30-y_YM2HgK+ILTh9"
    }
}

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

def pub(data):
    client.publishEvent(eventId="status", msgFormat="json", data=myData, qos=0, onPublish=None)
    print("Published data Successfully:%s",myData)

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

while True:
    myData={'name':'Train1','lat':10.184363,'lon': 77.922702}
    pub(myData)
    time.sleep(3)
    myData={'name':'Train1','lat':10.213225,'lon': 77.898765}
    pub(myData)
    time.sleep(3)
    myData={'name':'Train1','lat':10.285035,'lon': 77.921569}
    pub(myData)
    time.sleep(3)
    myData={'name':'Train1','lat':10.343369,'lon': 77.958056}
    pub(myData)
    time.sleep(3)
    myData={'name':'Train1','lat':10.356829,'lon': 77.980861}
    pub(myData)
    time.sleep(3)
    client.commandCallback = myCommandCallback
    client.disconnect()
```

Terminal Output (Right Window):

```
Published data Successfully:%s {'name': 'Train1', 'lat': 10.184363, 'lon': 77.922702}
Published data Successfully:%s {'name': 'Train1', 'lat': 10.213225, 'lon': 77.898765}
Published data Successfully:%s {'name': 'Train1', 'lat': 10.285035, 'lon': 77.921569}
Published data Successfully:%s {'name': 'Train1', 'lat': 10.343369, 'lon': 77.958056}
Published data Successfully:%s {'name': 'Train1', 'lat': 10.356829, 'lon': 77.980861}
Published data Successfully:%s {'name': 'Train1', 'lat': 10.184363, 'lon': 77.922702}
Published data Successfully:%s {'name': 'Train1', 'lat': 10.213225, 'lon': 77.898765}
Published data Successfully:%s {'name': 'Train1', 'lat': 10.285035, 'lon': 77.921569}
Published data Successfully:%s {'name': 'Train1', 'lat': 10.343369, 'lon': 77.958056}
Published data Successfully:%s {'name': 'Train1', 'lat': 10.356829, 'lon': 77.980861}
Published data Successfully:%s {'name': 'Train1', 'lat': 10.184363, 'lon': 77.922702}
Published data Successfully:%s {'name': 'Train1', 'lat': 10.213225, 'lon': 77.898765}
Published data Successfully:%s {'name': 'Train1', 'lat': 10.285035, 'lon': 77.921569}
Published data Successfully:%s {'name': 'Train1', 'lat': 10.343369, 'lon': 77.958056}
Published data Successfully:%s {'name': 'Train1', 'lat': 10.356829, 'lon': 77.980861}
Published data Successfully:%s {'name': 'Train1', 'lat': 10.184363, 'lon': 77.922702}
Published data Successfully:%s {'name': 'Train1', 'lat': 10.213225, 'lon': 77.898765}
Published data Successfully:%s {'name': 'Train1', 'lat': 10.285035, 'lon': 77.921569}
Published data Successfully:%s {'name': 'Train1', 'lat': 10.343369, 'lon': 77.958056}
Published data Successfully:%s {'name': 'Train1', 'lat': 10.356829, 'lon': 77.980861}
```

2)

The screenshot shows the IBM Watson IoT Platform interface. At the top, there are tabs for 'Browse', 'Action', 'Device Types', and 'Interfaces'. A search bar labeled 'Search by Device ID' is present. On the right, there is a 'Device Simulator' toggle and an 'Add Device' button. The main content area displays a table of devices:

Device ID	Status	Device Type	Class ID	Date Added	Descriptive Location
Jeeva_Yovan	Disconnected	Watson	Device	28 Oct 2022 19:58	
SSFR1	Connected	SSFR	Device	16 Nov 2022 10:32	

Below the device list, there is a section for 'Recent Events' for the selected device 'SSFR1'. It includes tabs for 'Identity', 'Device Information', 'Recent Events', 'State', and 'Logs'. The 'Recent Events' tab is active, showing a list of events:

Event	Value	Format	Last Received
status	{"name":"Train1","lat":10.285035,"lon":77.9215...	json	a few seconds ago
status	{"name":"Train1","lat":10.213225,"lon":77.8987...	json	a few seconds ago
status	{"name":"Train1","lat":10.184363,"lon":77.9227...	json	a few seconds ago
status	{"name":"Train1","lat":10.356829,"lon":77.9808...	json	a few seconds ago
status	{"name":"Train1","lat":10.343369,"lon":77.9580...	json	a few seconds ago

At the bottom right, it indicates '0 Simulations running'.

3)

The screenshot shows the Node-RED interface. On the left, there is a palette of nodes including 'date picker', 'colour picker', 'form', 'text', 'gauge', 'chart', 'audio out', 'notification', 'ui control', 'template', and 'worldmap'. The 'location' category is expanded, showing 'worldmap', 'worldmap in', 'tracks', and 'convex-hull'. In the center, 'Flow 1' is displayed with a grid background. It contains three nodes: 'IBM IoT' (connected), 'debug 1', and 'worldmap' (connected 1). The 'IBM IoT' node is connected to both 'debug 1' and 'worldmap'. On the right, the 'debug' console is open, showing a list of messages received from the 'IBM IoT' node. The messages are JSON objects containing location data for 'Train1'.

```

iot-2/type:SSFR1/SSFR1/ev/status/fmt/json
msg.payload: Object
{
  name: "Train1", lat: 10.184363,
  lon: 77.922702
}

16/11/2022, 11:06:53 am node: debug 1
iot-2/type:SSFR1/SSFR1/ev/status/fmt/json
msg.payload: Object
{
  name: "Train1", lat: 10.213225,
  lon: 77.898765
}

16/11/2022, 11:06:55 am node: debug 1
iot-2/type:SSFR1/SSFR1/ev/status/fmt/json
msg.payload: Object
{
  name: "Train1", lat: 10.285035,
  lon: 77.921569
}

16/11/2022, 11:06:57 am node: debug 1
iot-2/type:SSFR1/SSFR1/ev/status/fmt/json
msg.payload: Object
{
  name: "Train1", lat: 10.343369,
  lon: 77.958056
}

16/11/2022, 11:07:00 am node: debug 1
iot-2/type:SSFR1/SSFR1/ev/status/fmt/json
msg.payload: Object
{
  name: "Train1", lat: 10.356829,
  lon: 77.980861
}

16/11/2022, 11:07:03 am node: debug 1
iot-2/type:SSFR1/SSFR1/ev/status/fmt/json
msg.payload: Object
{
  name: "Train1", lat: 10.184363,
  lon: 77.922702
}

```

4)

Live Status

