Sprint 02

Signs with Smart Connectivity for Better Road Safety

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SPRINT GOALS:

Push data from local code to cloud

PROGRAM CODE:

> weather.py
This file is a utility function that fetches the weather from OpenWeatherAPI. It returns only certain required parameters of the API response.

```
# Python code

import requests as reqs

def get(myLocation,APIKEY): apiURL
   =
f"https://api.openweathermap.org/data/2.5/weather?q={myLocation}&appid={API
KEY}"
   responseJSON = (reqs.get(apiURL)).json() returnObject
   = {
      "temperature" : responseJSON['main']['temp'] - 273.15,
      "weather" : [responseJSON['weather'][_]['main'].lower() for _ in
range(len(responseJSON['weather']))],
      "visibility" : responseJSON['visibility']/100, # visibility in percentage where
10km is 100% and 0km is 0%
   } if("rain" in
   responseJSON):
      returnObject["rain"] = [responseJSON["rain"][key] for key in
responseJSON["rain"]] return(returnObject)
```

> publishData.py
This code pushes data to the cloud and logs data. IBM Cloud is configured such that the data is displayed in the following website: CLICK TO OPEN NODE RED DASHBOARD

```
# Python code
# IMPORT SECTION STARTS

import wiotp.sdk.device # python -m pip install wiotp import
time

# IMPORT SECTION ENDS
#  ____________________________________
# API CONFIG SECTION STARTS

myConfig = {
    "identity" : {
        "orgId" : "epmoec",
        "typeId" : "testDevice",
        "deviceId" : "device0"
    },
    "auth" : {
        "token" : "?-KDXUPMvDo_TK2&b1"
    }
}


# API CONFIG SECTION ENDS
#  ____________________________________
# FUNCTIONS SECTION STARTS

def myCommandCallback(cmd): print("recieved
    cmd : ",cmd)



def logData2Cloud(location,temperature,visibility):
    client = wiotp.sdk.device.DeviceClient(config=myConfig,logHandlers=None)
    client.connect()
    client.publishEvent(eventId="status",msgFormat="json",data={
        "temperature" : temperature,
        "visibility" : visibility,
        "location" : location
    },qos=0,onPublish=None)
    client.commandCallback = myCommandCallback client.disconnect()
```

```
    time.sleep(1)



# FUNCTIONS SECTION ENDS
```

> brain.py
This file is a utility function that returns only essential information to be displayed at the hardware side and abstracts all the unnecessary details. This is where the code flow logic is implemented.

```
from datetime import datetime as dt from
publishData import logData2Cloud as log2cloud

# IMPORT SECTION ENDS
#  ____________________________________
# UTILITY LOGIC SECTION STARTS
def    processConditions(myLocation,APIKEY,localityInfo):    weatherData    =
    weather.get(myLocation,APIKEY)
    log2cloud(myLocation,weatherData["temperature"],weatherData["visibility"]
    )

    finalSpeed = localityInfo["usualSpeedLimit"] if "rain" not in weatherData else
localityInfo["usualSpeedLimit"]/2 finalSpeed = finalSpeed if
    weatherData["visibility"]>35 else finalSpeed/2

    if(localityInfo["hospitalsNearby"]):
        # hospital zone
    doNotHonk = True else:
        if(localityInfo["schools"]["schoolZone"]==False):
            # neither school nor hospital zone
            doNotHonk = False else:
            #          school          zone          now          =
            [dt.now().hour,dt.now().minute]  activeTime  =
            [list(map(int,_.split(":"))) for _ in
localityInfo["schools"]["activeTime"]] doNotHonk =
            activeTime[0][0]<=now[0]<=activeTime[1][0] and
activeTime[0][1]<=now[1]<=activeTime[1][1]
```

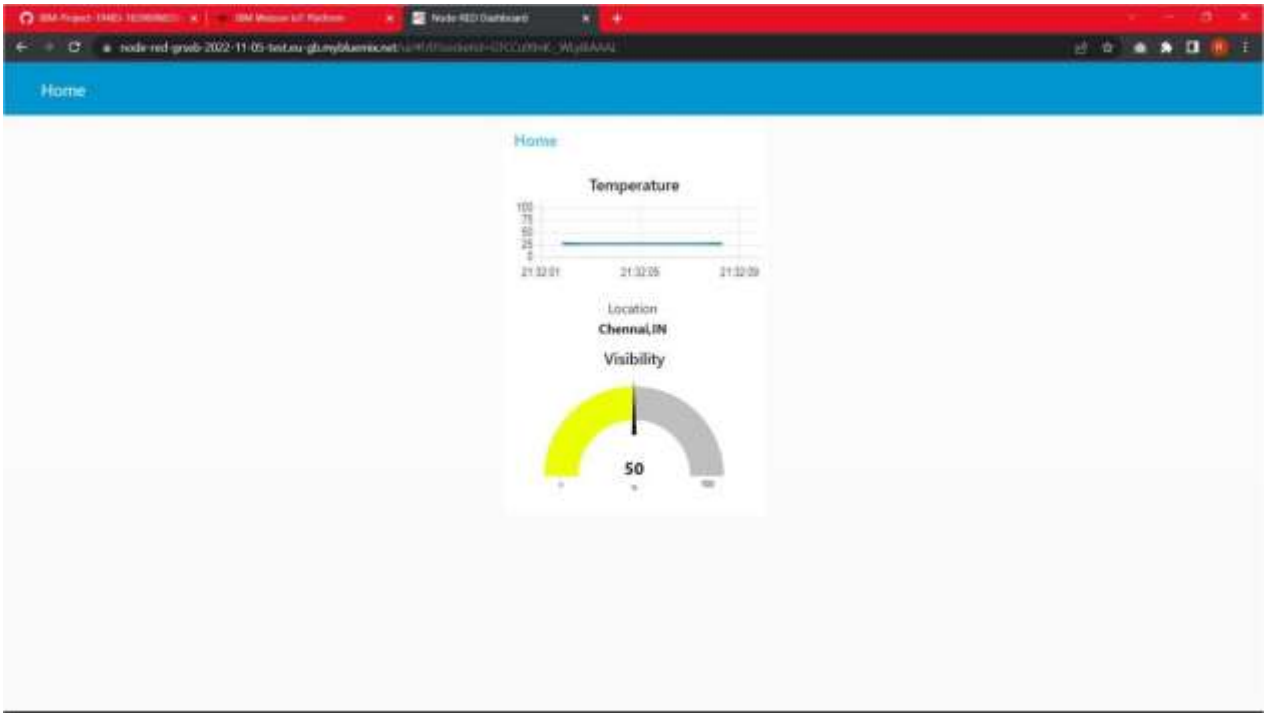
```
    return({
       "speed" : finalSpeed,
       "doNotHonk" : doNotHonk
    })

 # UTILITY LOGIC SECTION ENDS

 > main.py
 The code that runs in a forever loop in the micro-controller. This calls all the util
 functions from other python files and based on the return value transduces changes
 in the output hardware display.

 # Python code

 #IMPORT SECTION STARTS

 import brain

 # IMPORT SECTION ENDS
#  ____________________________________
 # USER INPUT SECTION STARTS

 myLocation = "Chennai,IN"
 APIKEY = "bf4a8d480ee05c00952bf65b78ae826b"

 localityInfo = {
    "schools" : {
       "schoolZone" : True,
       "activeTime" : ["7:00","17:30"] # schools active from 7 AM till 5:30 PM
       },
    "hospitalsNearby" : False,
    "usualSpeedLimit" : 40 # in km/hr }

 # USER INPUT SECTION ENDS
#  ____________________________________
 # MICRO-CONTROLLER CODE STARTS while
 True :
    print(brain.processConditions(myLocation,APIKEY,localityInfo))

 '''
 MICRO CONTROLLER CODE WILL BE ADDED IN SPRINT 3 AS PER OUR
```

PLANNED SPRINT SCHEDULE
'''

MICRO-CONTROLLER CODE ENDS

Output :
LINK TO NODE RED DASHBOARD

Code Output
2022-11-06 21:38:33,452 wiotp.sdk.device.client.DeviceClient INFO
Connected successfully: d:epmoec:testDevice:device0
2022-11-06 21:38:33,452 wiotp.sdk.device.client.DeviceClient INFO
Disconnected from the IBM Watson IoT Platform
2022-11-06 21:38:33,452 wiotp.sdk.device.client.DeviceClient INFO Closed connection to the IBM Watson IoT Platform {'speed': 40, 'doNotHonk': False}
2022-11-06 21:38:35,631 wiotp.sdk.device.client.DeviceClient INFO
Connected successfully: d:epmoec:testDevice:device0
2022-11-06 21:38:35,631 wiotp.sdk.device.client.DeviceClient INFO
Disconnected from the IBM Watson IoT Platform
2022-11-06 21:38:35,631 wiotp.sdk.device.client.DeviceClient INFO Closed connection to the IBM Watson IoT Platform {'speed': 40, 'doNotHonk': False}
.
.
.
... repeats every 1 sec Images
:
OutputImage2



Output Image