Project Development phase

Date	31 October 2022
Team ID	PNT2022TMID22104
Project Name	Signs with Smart Connectivity for Better Road Safety
Team Leader	C. Rujesh Kumar
Team Members	Pokala Rohith Praveen.G Yokesh.G

Sprint-2

1. Push data from local code to cloud

Program Code

Weather Program

```
#Pythoncode

import requests as reqs


def get(myLocation,APIKEY):
    apiURL = f"https://api.openweathermap.org/data/2.5/weather?q={myLocation}&appid={APIKEY}"
    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)
```

Publishing the Data

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**

https://node-red-grseb-2022-11-05-test.eu-gb.mybluemix.net/ui/#!/0?socketid=GTCCu99nK-_WLy8iAAAL

```
# 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
```

Flow logic

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.

```
#
Python
code

        # IMPORT SECTION STARTS

        import weather
        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 Program

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
```

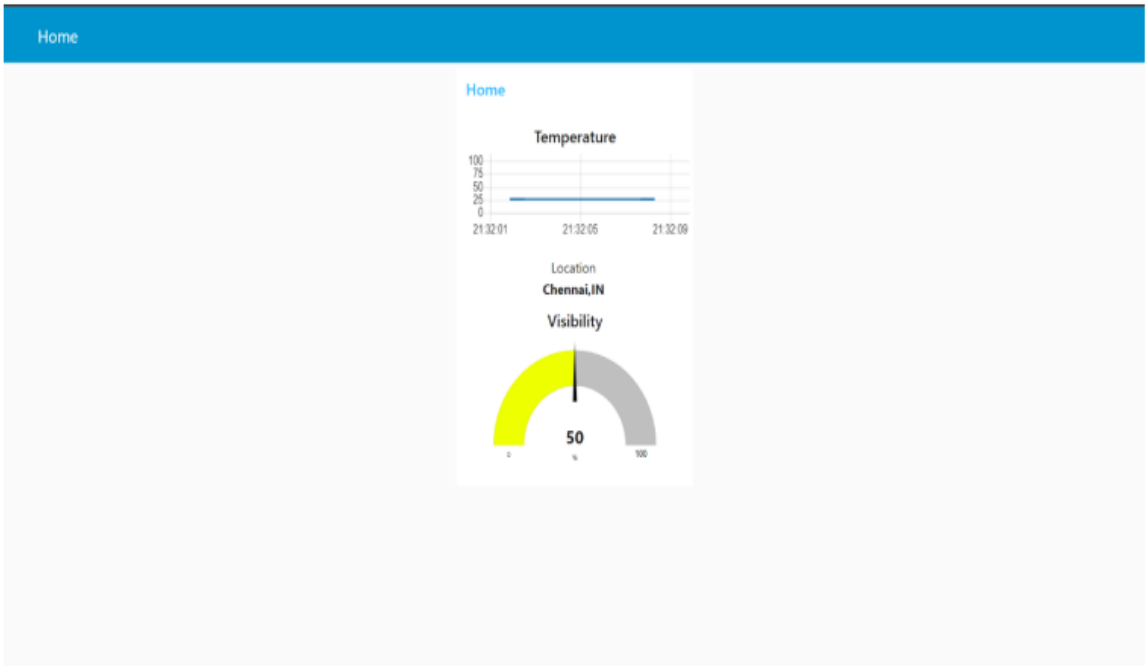
Output

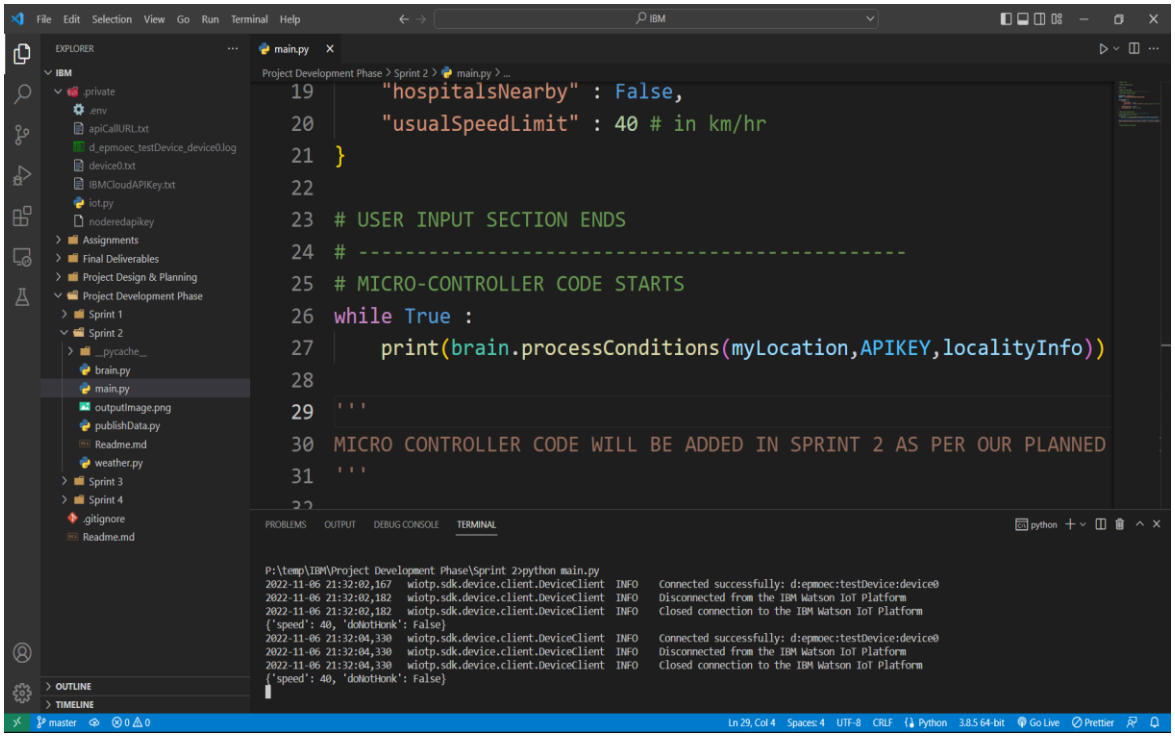
LINK TO NODE RED DASHBOARD

https://node-red-grseb-2022-11-05-test.eu-gb.mybluemix.net/ui/#!/0?socketid=GTCCu99nK-_WLy8iAAAL

```
# 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
```

IMAGE




File Edit Selection View Go Run Terminal Help
IBM
EXPLORER
IBM
.private
.env
apiCallURL.txt
d_epmoec_testDevice_device0.log
device0.txt
IBMCloudAPIKey.txt
iot.py
noderedapikey
Assignments
Final Deliverables
Project Design & Planning
Project Development Phase
Sprint 1
Sprint 2
__pycache__
brain.py
main.py
outputImage.png
publishData.py
Readme.md
weather.py
Sprint 3
Sprint 4
.gitignore
Readme.md
OUTLINE
TIMELINE
main.py
Project Development Phase > Sprint 2 > main.py > ...
"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 2 AS PER OUR PLANNED
'''
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL
python
P:\temp\IBM\Project Development Phase\Sprint 2>python main.py
2022-11-06 21:32:02,167 wiotp.sdk.device.client.DeviceClient INFO Connected successfully: d:epmoec:testDevice:device0
2022-11-06 21:32:02,182 wiotp.sdk.device.client.DeviceClient INFO Disconnected from the IBM Watson IoT Platform
2022-11-06 21:32:02,182 wiotp.sdk.device.client.DeviceClient INFO Closed connection to the IBM Watson IoT Platform
{'speed': 40, 'doNotHonk': False}
2022-11-06 21:32:04,330 wiotp.sdk.device.client.DeviceClient INFO Connected successfully: d:epmoec:testDevice:device0
2022-11-06 21:32:04,330 wiotp.sdk.device.client.DeviceClient INFO Disconnected from the IBM Watson IoT Platform
2022-11-06 21:32:04,330 wiotp.sdk.device.client.DeviceClient INFO Closed connection to the IBM Watson IoT Platform
{'speed': 40, 'doNotHonk': False}
master
Ln 29, Col 4 Spaces: 4 UTF-8 CRLF Python 3.8.5 64-bit Go Live Prettier