

## Project Development Phase

### Project Development Delivery of Sprint 1

Date	16 September 2022
Team ID	PNT2022TMID16025
Project Name	Signs with smart connectivity for Better road safety
Maximum Marks	4 Marks

## Signs with smart connectivity for Better road safety

### Sprint Goals :

1. Create and initialize accounts in various public APIs like OpenWeather API
2. Write a Python program that outputs results given the inputs like weather and location.

**Program Code :**

## Weather.py:

```
# Python code
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)
```

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.

```
# Python code
# IMPORT SECTION STARTS
importweather
fromdatetimeimportdatetimeasdt
# IMPORT SECTION ENDS
# --- - - - - -
# UTILITY LOGIC SECTION STARTS
```

```
defprocessConditions(myLocation,APIKEY,localityInfo):  
weatherData=weather.get(myLocation,APIKEY)  
finalSpeed=localityInfo["usualSpeedLimit"]  
if"rain"notinweatherDataelselocalityInfo["usualSpeedLimit"]/2  
finalSpeed=finalSpeedifweatherData["visibility"]>35elsefinalSpeed/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 _inlocalityInfo["schools"]["activeTime"]]
doNotHonk=activeTime[0][0]<=now[0]<=activeTime[1][0]
andactiveTime[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 microcontroller. This calls all the util functions from other python files and based on the return value transduces changes in the output hardware display.

```

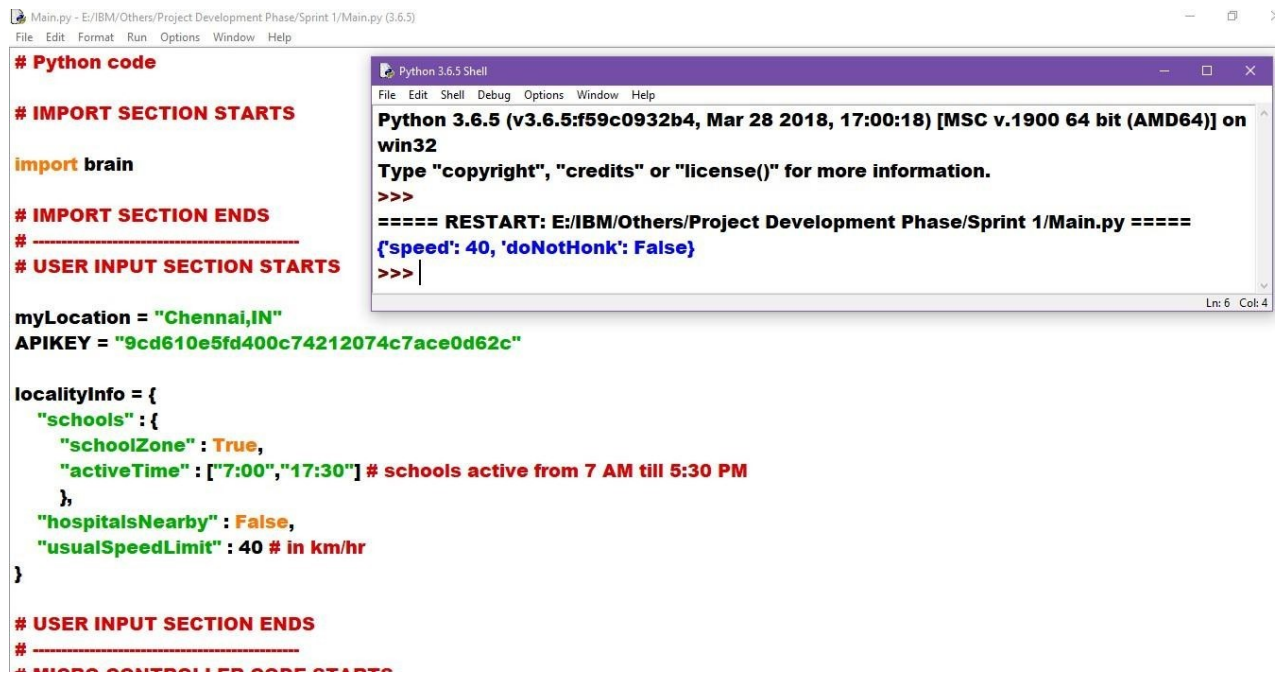
# Python code
# IMPORT SECTION STARTS
import brain
# IMPORT SECTION ENDS
# --- - - - - - - - - - - - - - - - - - - - - ---
# USER INPUT SECTION STARTS
myLocation="Chennai,IN"
APIKEY="9cd610e5fd400c74212074c7ace0d62c"
localityInfo=
{ "schools" :
{ "schoolZone" :
True,
"activeTime" : ["7:00","17:30"] # schools active from 7 AM till 5:30 PM
},
"hospitalsNearby" : False,
"usualSpeedLimit" : 40# in km/hr
}
# USER INPUT SECTION ENDS
# --- - - - - - - - - - - - - - - - - - - - - ---
# MICRO-CONTROLLER CODE STARTS
print(brain.processConditions(myLocation,APIKEY,localityInfo))
'''
MICRO CONTROLLER CODE WILL BE ADDED IN SPRINT 2 AS PER OUR PLANNED
SPRINT SCHEDULE
'''
# MICRO-CONTROLLER CODE ENDS

```

## Output :

### # Code Output

```
{'speed': 40, 'doNotHonk': False}
```



The screenshot displays a Python IDE with a file named 'Main.py' at the path 'E:/IBM/Others/Project Development Phase/Sprint 1/Main.py (3.6.5)'. The code in the editor includes section markers, an import statement for 'brain', variable assignments for 'myLocation' and 'APIKEY', and a dictionary 'localityInfo' containing details about schools and hospitals. A Python 3.6.5 Shell window on the right shows the execution output, including version information and the printed dictionary {'speed': 40, 'doNotHonk': False}.

```
# Python code

# IMPORT SECTION STARTS

import brain

# IMPORT SECTION ENDS
# -----
# USER INPUT SECTION STARTS

myLocation = "Chennai,IN"
APIKEY = "9cd610e5fd400c74212074c7ace0d62c"

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
# -----
# MORE CONTROLLER CODE STARTS
```

```
Python 3.6.5 Shell
Python 3.6.5 (v3.6.5:f59c0932b4, Mar 28 2018, 17:00:18) [MSC v.1900 64 bit (AMD64)] on win32
Type "copyright", "credits" or "license()" for more information.
>>>
===== RESTART: E:/IBM/Others/Project Development Phase/Sprint 1/Main.py =====
{'speed': 40, 'doNotHonk': False}
>>> |
```