

## Project Development Phase

### Project Development Delivery of Sprint 1

Date	16 September 2022
Team ID	PNT2022TMID44776
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()
    responseObject = {
        "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):
        responseObject["rain"] = [responseJSON["rain"][key] for key in responseJSON["rain"]]
    return (responseObject)
```

**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.

```

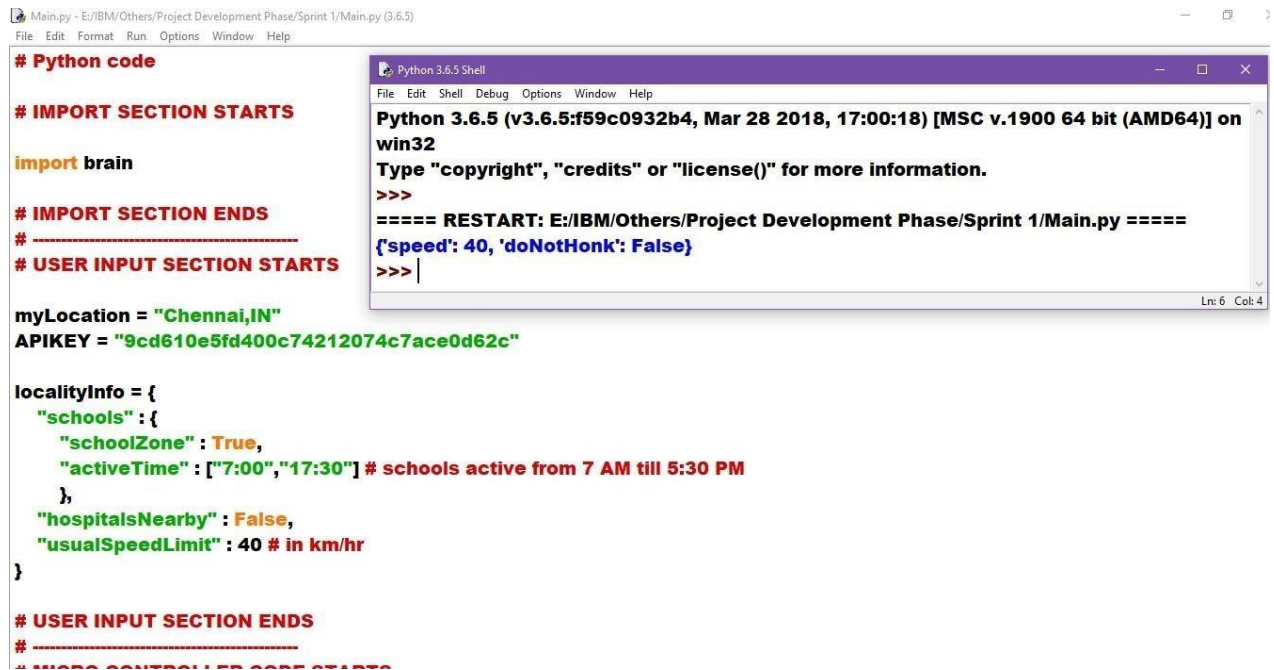
# Python code
# IMPORT SECTION STARTS
importbrain
# IMPORT SECTION ENDS
# --- ____-____-____-____-____-____-____-____-__
# USER INPUT SECTION STARTS
myLocation="Chennai,IN"
APIKEY="9cd610e5fd400c74212074c7ace0d62c"
localityInfo=
{ "schools" :
{ "schoolZone" :
True,
"activeTime" : ["7:00","17:30"] # schools 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 image shows a Python IDE window titled 'Main.py - E:/IBM/Others/Project Development Phase/Sprint 1/Main.py (3.6.5)'. The code in the editor includes comments for section starts and ends, an import statement for 'brain', and a dictionary 'localityInfo' with keys for 'schools', 'hospitalsNearby', and 'usualSpeedLimit'. The 'schools' key has a value of a dictionary with 'schoolZone' set to True and 'activeTime' set to a list of strings. The 'usualSpeedLimit' is set to 40. The output window, titled 'Python 3.6.5 Shell', shows the Python version and build information, followed by the command prompt 'Type "copyright", "credits" or "license()" for more information.' and the prompt '==== RESTART: E:/IBM/Others/Project Development Phase/Sprint 1/Main.py ====='. The output of the code execution is the 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
# -----
# USER CONTROLLER CODE STARTS
```

```
Python 3.6.5 Shell
File Edit Shell Debug Options Window Help
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}
>>>
```