PROJECT DEVELOPMENT PHASE

SPRINT 1

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Project Name	Project – Signs with Smart Connectivity for Better Road Safety

PROGRAM CODE :

1. Weather.py

This file contains a utility function that uses the OpenWeather API to retrieve the weather. Only a few of the necessary API response parameters are returned.

```
# 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)
```

2. brain.py

This file is a utility function that abstracts all unnecessary details and only returns the information that is necessary to be displayed on the hardware side. The logic for the code flow is carried out here.

```
# Python code


import weather
from datetime import datetime as dt


def processConditions(myLocation,APIKEY,localityInfo):
    weatherData = weather.get(myLocation,APIKEY)


    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
    })
```

3. Main.py

The code that runs in a forever loop in the microcontroller. This calls all the utilfunctions from other python files and based on the return value transduces changes in the output hardware display.

```
# Python code

import brain

myLocation = "Chennai,IN"
APIKEY = "c76d51c15c0e7c6c5f2002ad65efcec1"

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
}

print(brain.processConditions(myLocation,APIKEY,localityInfo))
```

OUTPUT:

```
# Code Output
{'speed': 40, 'doNotHonk': False}
```