Sprint 01

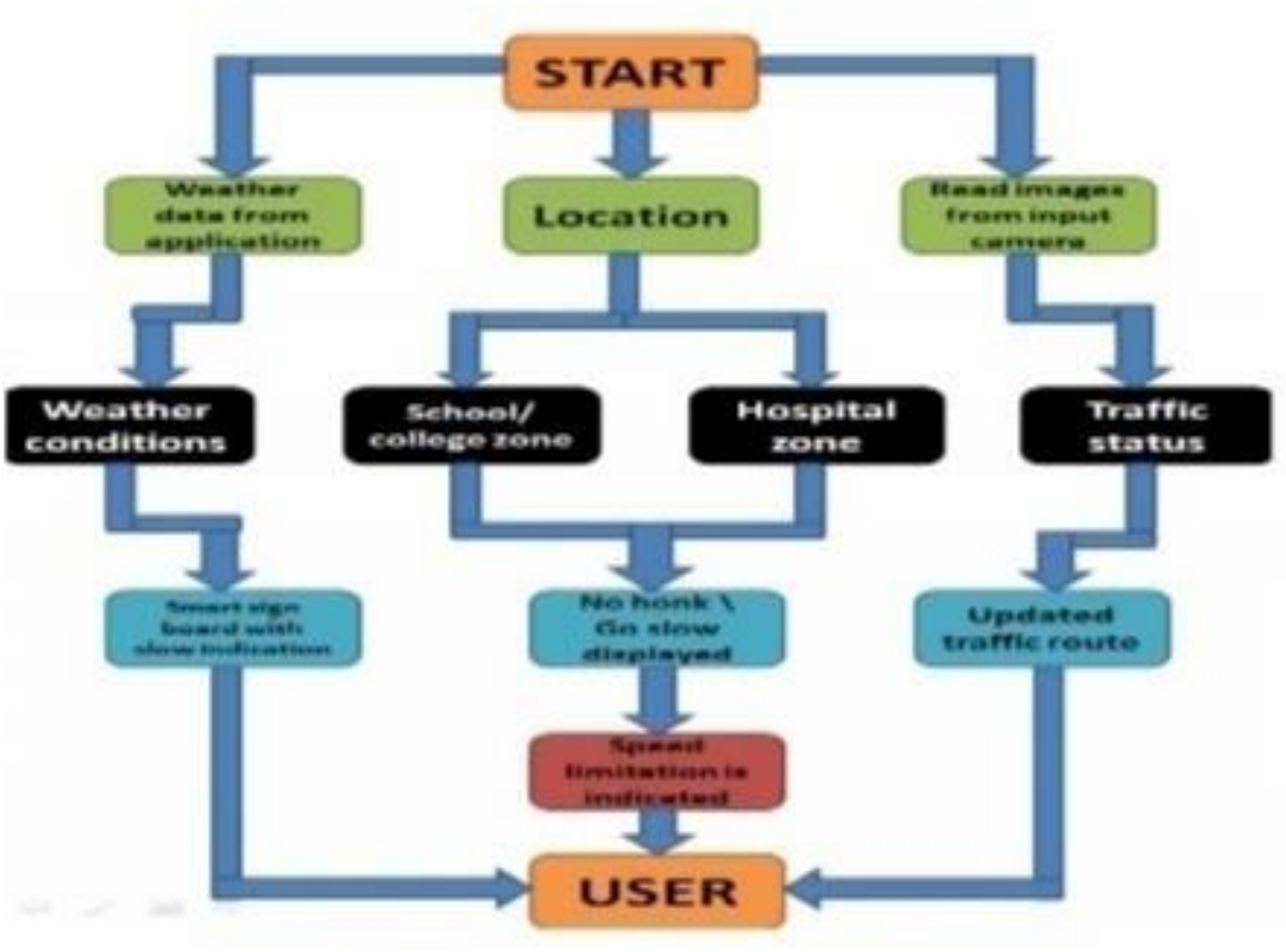
Team ID	**PNT2022TMID41856**
Project Title	**Signs with smart connectivity for better road safety**

Sprint Goals

1. Create and initialize accounts in various publicAPIs like OpenWeather API.

2. Write a Python program that outputs resultsgiven the inputs like weather and location.

Code Flow :


START
Weather data from application
Location
Read images from input camera
Weather conditions
School/ college zone
Hospital zone
Traffic status
Smart sign board with slow indication
No honk \ Go slow displayed
Updated traffic route
Speed limitation is indicated
USER

Program Code :

weather

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

```
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 hardwareside and abstracts all the unnecessary details. This is where the code flow logic is implemented.

```
# IMPORT SECTION STARTS


import weather
from datetime import datetime as dt


# IMPORT SECTION ENDS
# -----------------------------------------------
# UTILITY LOGIC SECTION STARTS
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
    })


# UTILITY LOGIC SECTION ENDS
```

main.py

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

```
# 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


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 :

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