Sprint 01

Signs with Smart Connectivity for Better Road Safety

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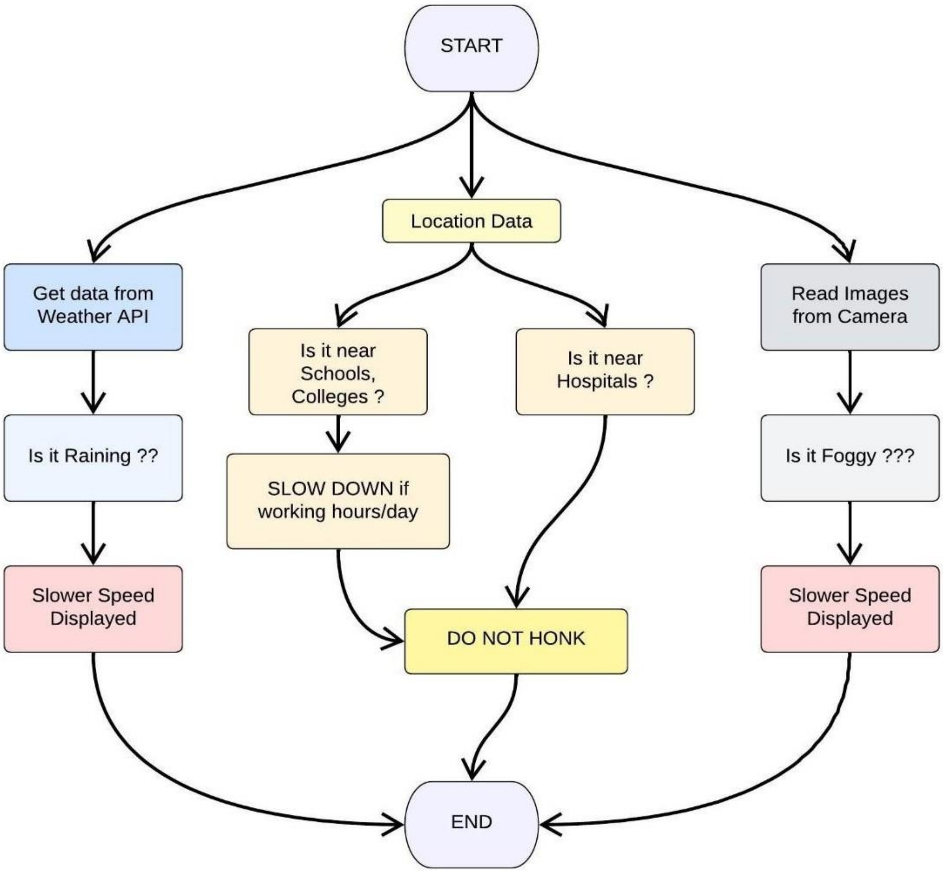
Sprint Goals :

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.

Code Flow :



Program Code :

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

# 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


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 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}
```