

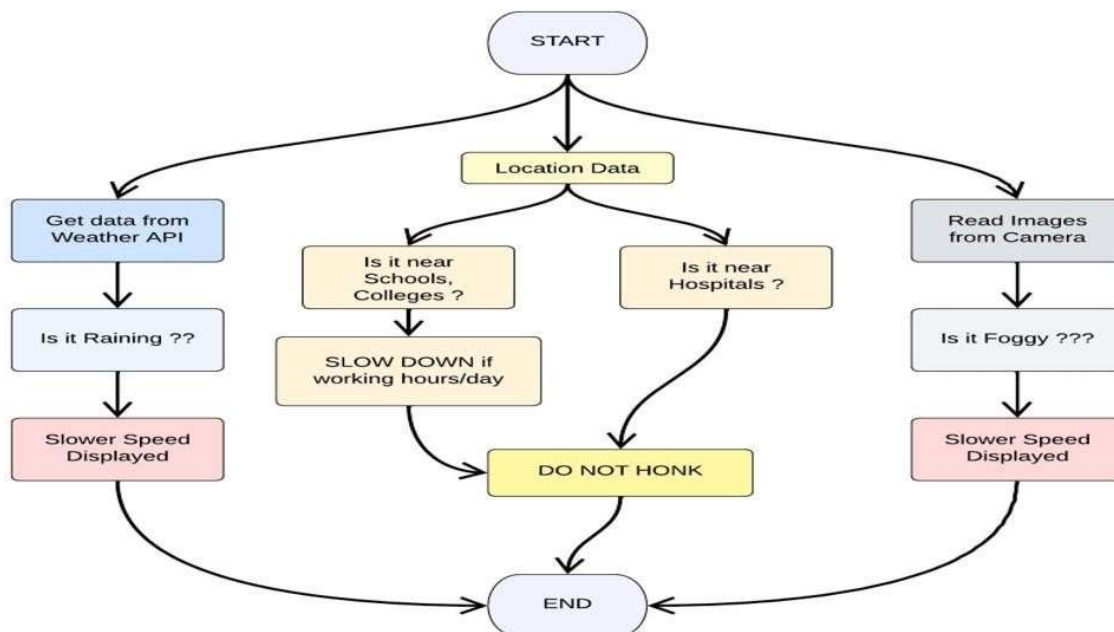
SPRINT 1

Date	29 October 2022
Team ID	PNT2022TMID10209
Project Name	Project – 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.

CODE FLOW:



PROGRAM CODE:

Weather.py

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,APIKE
```

```
        Y):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
```

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 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 = "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:

Code Output

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

IMAGES:

