

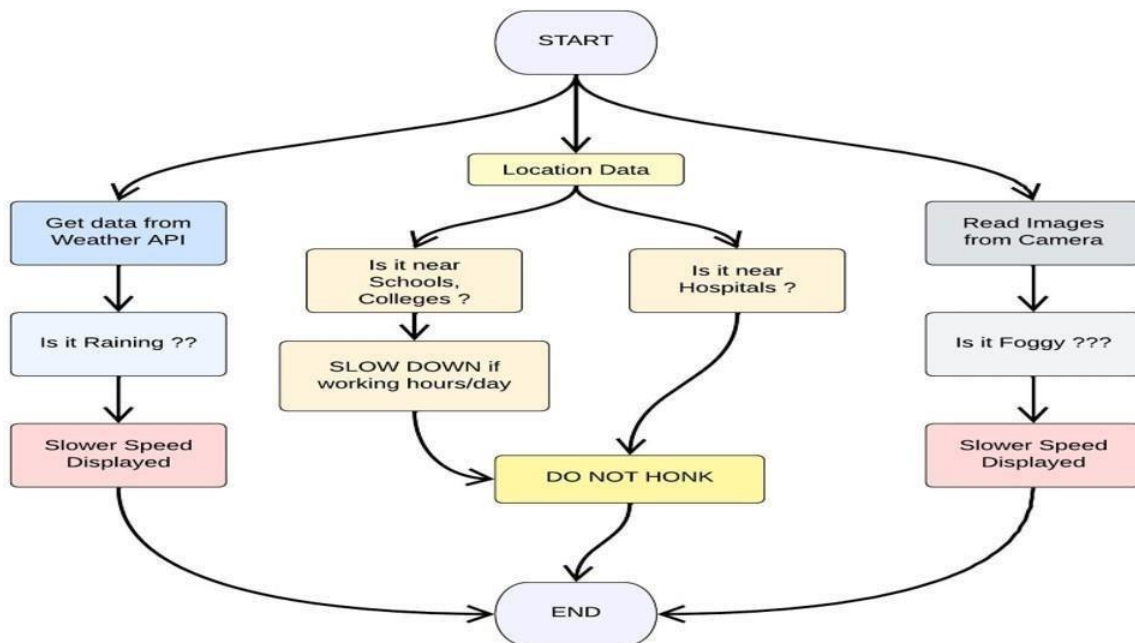
SPRINT 1

Team ID	PNT2022TMID31446
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}&ap  
pi d={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:

