

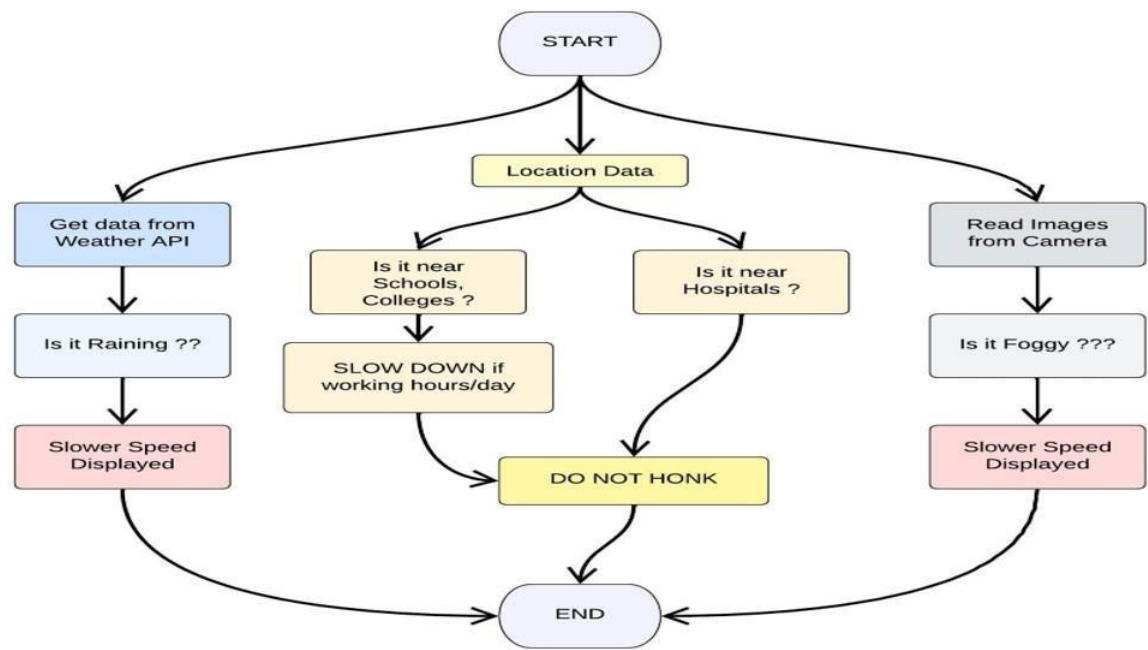
SPRINT 01

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()
```

```
    responseObject = {
```

```
        "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):
```

```
        responseObject["rain"] = [responseJSON["rain"][key]
```

```
for key in responseJSON["rain"]]
```

```
    return(responseObject
```

```
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:

