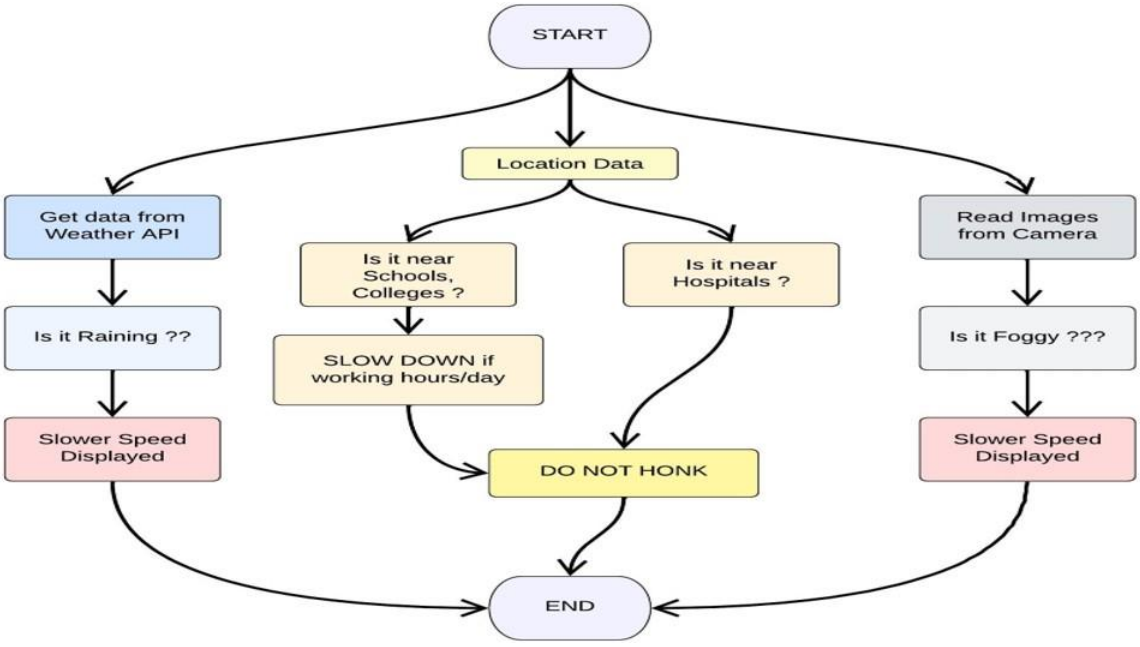
SPRINT 01

Date	27 October 2022
Team ID	PNT2022TMID38493
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. Itreturns 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}&appi
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 where10km is 100% and 0km is 0%

  }

  if("rain" in responseJSON):

    returnObject["rain"] = [responseJSON["rain"][key]
for key inresponseJSON["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: