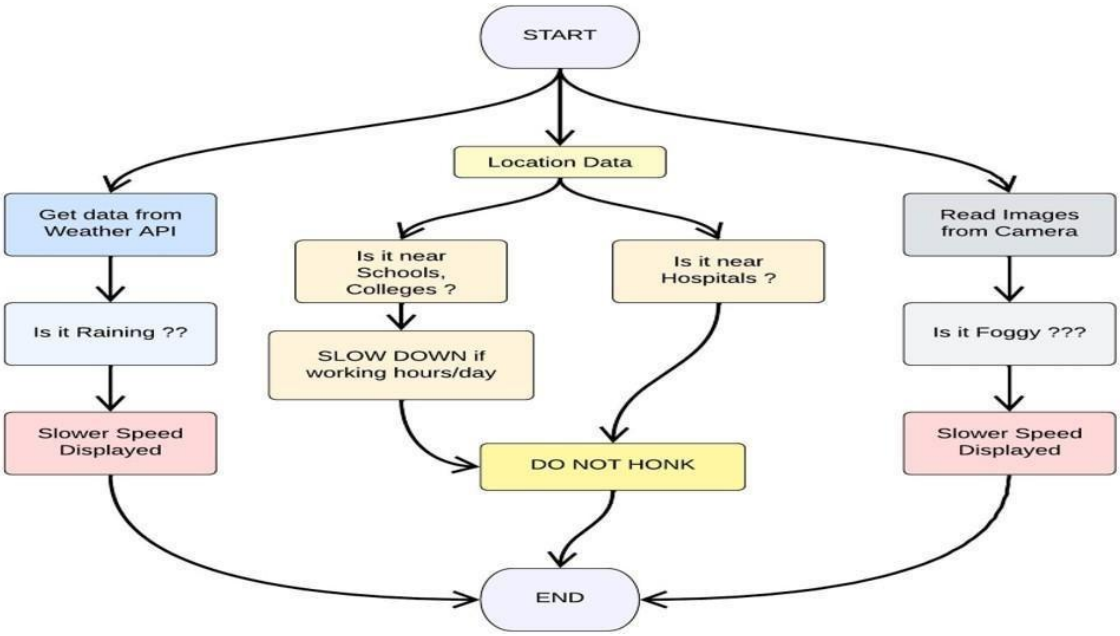
SPRINT 01

Date	10th november 2022
Team ID	PNT2022TMID13679
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,APIK
  E 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 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: