PROJECT DEVELOPMENT PHASE

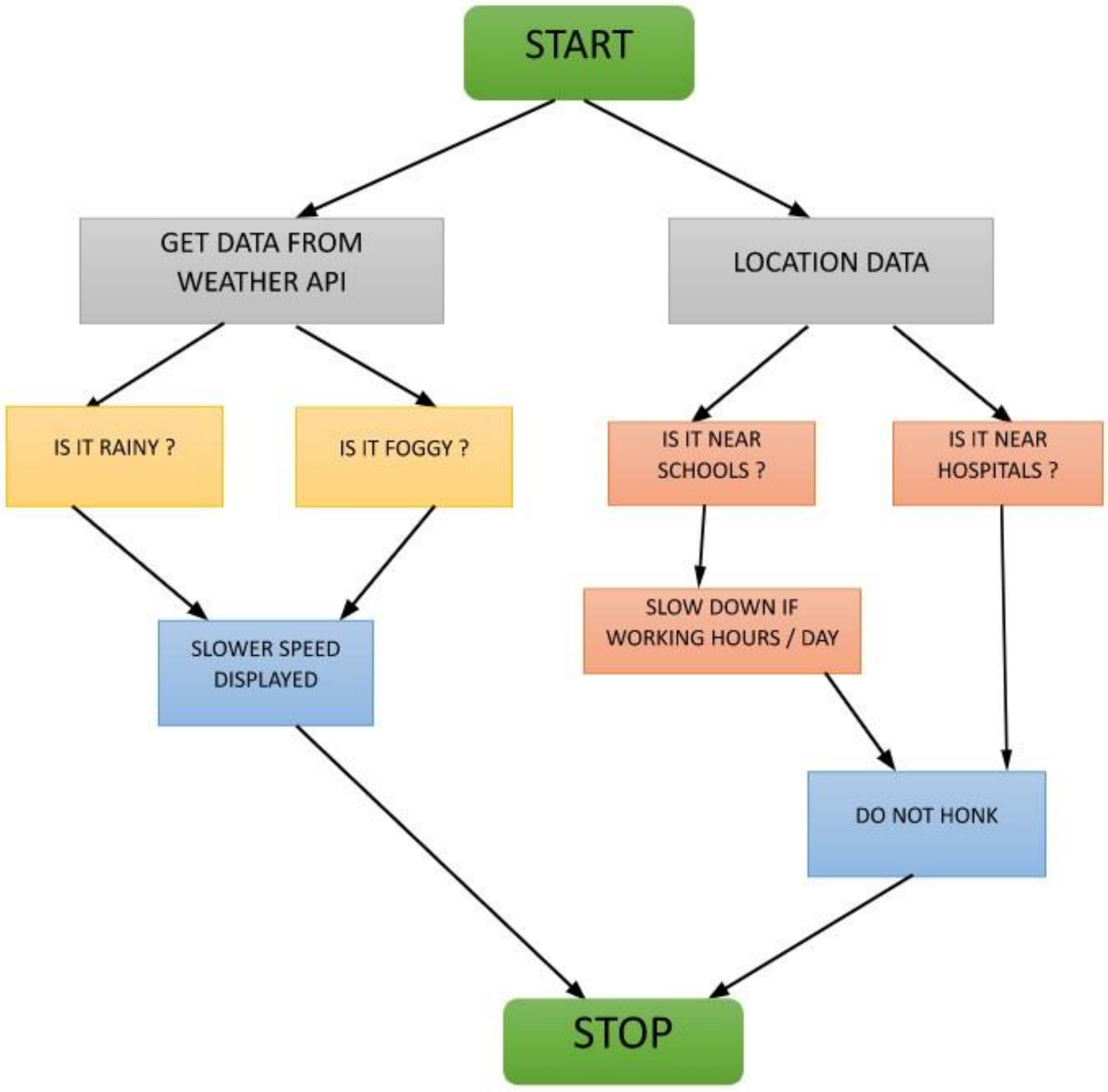
DELIVERY OF SPRINT - 1

Date	13 November 2022
Project Name	Signs with Smart Connectivity for Better Road Safety
Team ID	PNT2022TMID32979

Sprint Goals:

1. Create and initialize accounts in various public APIs like Open Weather API.
2. Write a Python program that outputs results given the inputs like weather and location.

Code Flow:



> brain.py

This file is a utility function that returns only essential information to be displayed at the hardwareside 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]
andactiveTime[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 micro-controller. 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
```

> weather.py

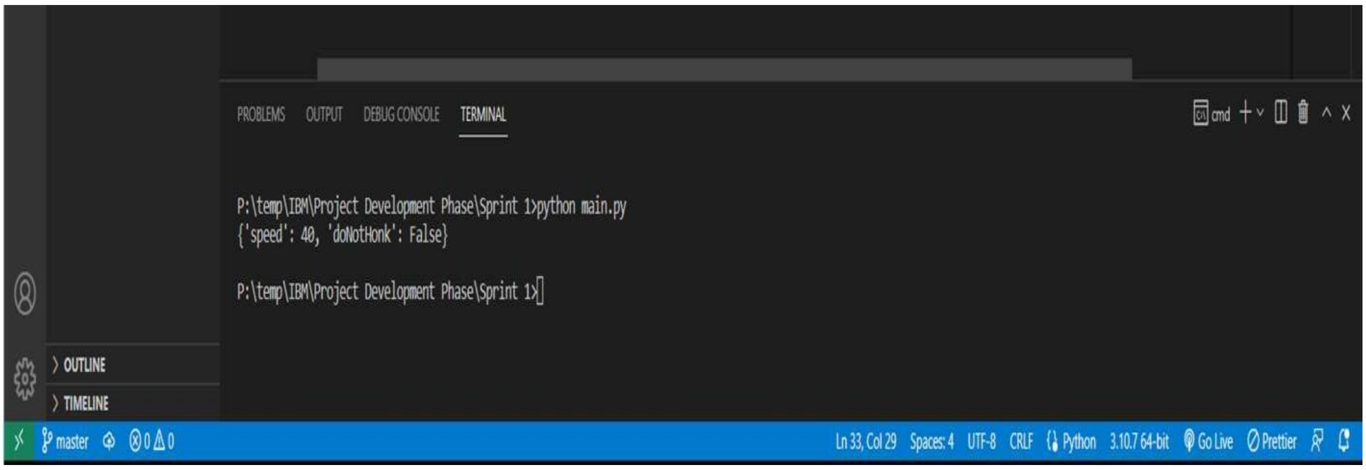
This file is a utility function that fetches the weather from OpenWeatherAPI. It returns only certainrequired parameters of the API response.

```
# Python code

import requests as reqs



def get(myLocation,APIKEY):

  apiURL =
f"https://api.openweathermap.org/data/2.5/weather?q={myLocation}&appid={APIKEY}"

  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)
```

Output:

# Code Output

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



```
P:\temp\IBM\Project Development Phase\Sprint 1>python main.py
{'speed': 40, 'doNotHonk': False}

P:\temp\IBM\Project Development Phase\Sprint 1>
```