SPRINT 01

SIGNS WITH SMART CONNECTIVITY FOR BETTER ROAD SAFETY

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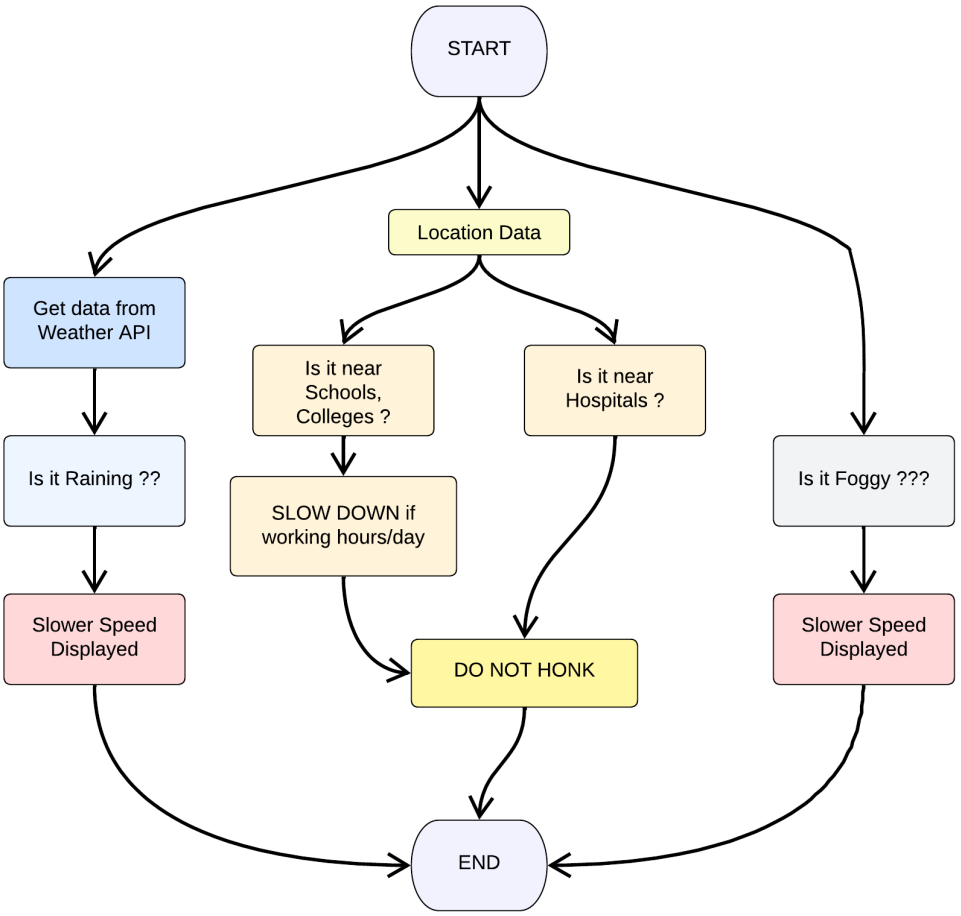
Sprint Goals:

1. Create and initialise 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 :

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

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
   }
```

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
```

OUTPUT:

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

IMAGES: