

PROJECT DEVELOPMENT PHASE

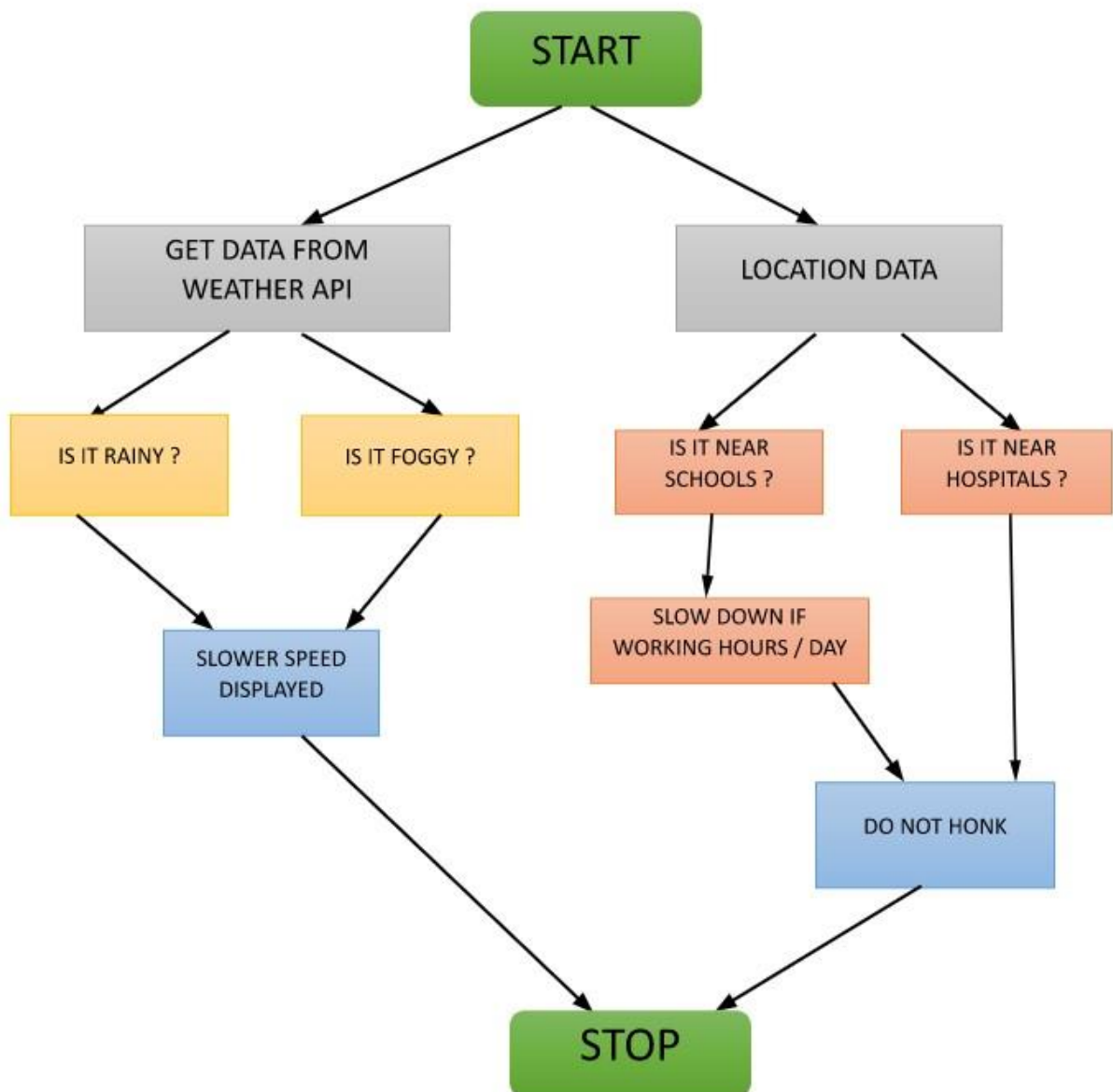
DELIVERY OF SPRINT - 1

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

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 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 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 = "Thiruvarur,IN"
```

```
APIKEY = "22aa01c42f0c7e0d38ecb57f4fc65226"
```

```
localityInfo = { "schools" : {
```

```
"schoolZone" : True,
```

```
"activeTime" : ["7:00","17:30"] # schools active from 7 AM till 5:30 PM
```

```
},
```

```
"hospitalsNearby" : False, "usualSpeedLimit" : 50 # 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 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}&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"]
```

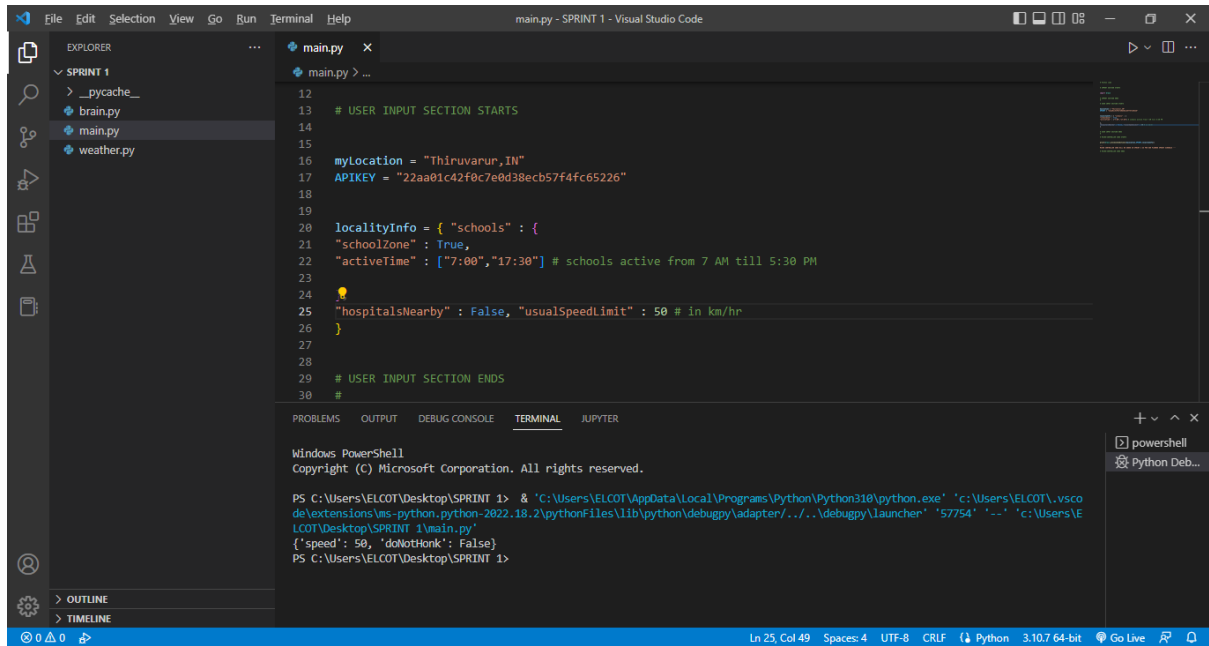
```
        ]
```

```
    return(returnObject)
```

Output:

code output

```
{'speed' : 50, 'doNotHonk' : False}
```



The screenshot shows the Visual Studio Code interface with a Python file named `main.py` open. The file contains a script that defines a location, an API key, and a dictionary for locality information. The terminal window at the bottom shows the command used to run the script and the resulting JSON output.

```
12
13 # USER INPUT SECTION STARTS
14
15
16 myLocation = "Thiruvananthapuram,IN"
17 APIKEY = "22aa01c42f0c7e0d38ecb57f4fc65226"
18
19
20 localityInfo = { "schools" : {
21   "schoolZone" : True,
22   "activeTime" : ["7:00","17:30"] # schools active from 7 AM till 5:30 PM
23 }
24
25 "hospitalsNearby" : False, "usualSpeedLimit" : 50 # in km/hr
26 }
27
28
29 # USER INPUT SECTION ENDS
30 #
```

Terminal Output:

```
Windows PowerShell
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PS C:\Users\ELCOT\Desktop\SPRINT 1> & 'C:\Users\ELCOT\AppData\Local\Programs\Python\Python310\python.exe' 'c:\Users\ELCOT\
de\extensions\ms-python.python-2022.18.2\pythonFiles\lib\python\debugpy\launcher' '57754' '--' 'c:\Users\ELCOT\Desktop\SPRINT 1\main.py'
{'speed': 50, 'doNotHonk': False}
PS C:\Users\ELCOT\Desktop\SPRINT 1>
```