**Project Development Phase**
**Project Development Delivery of Sprint 1**

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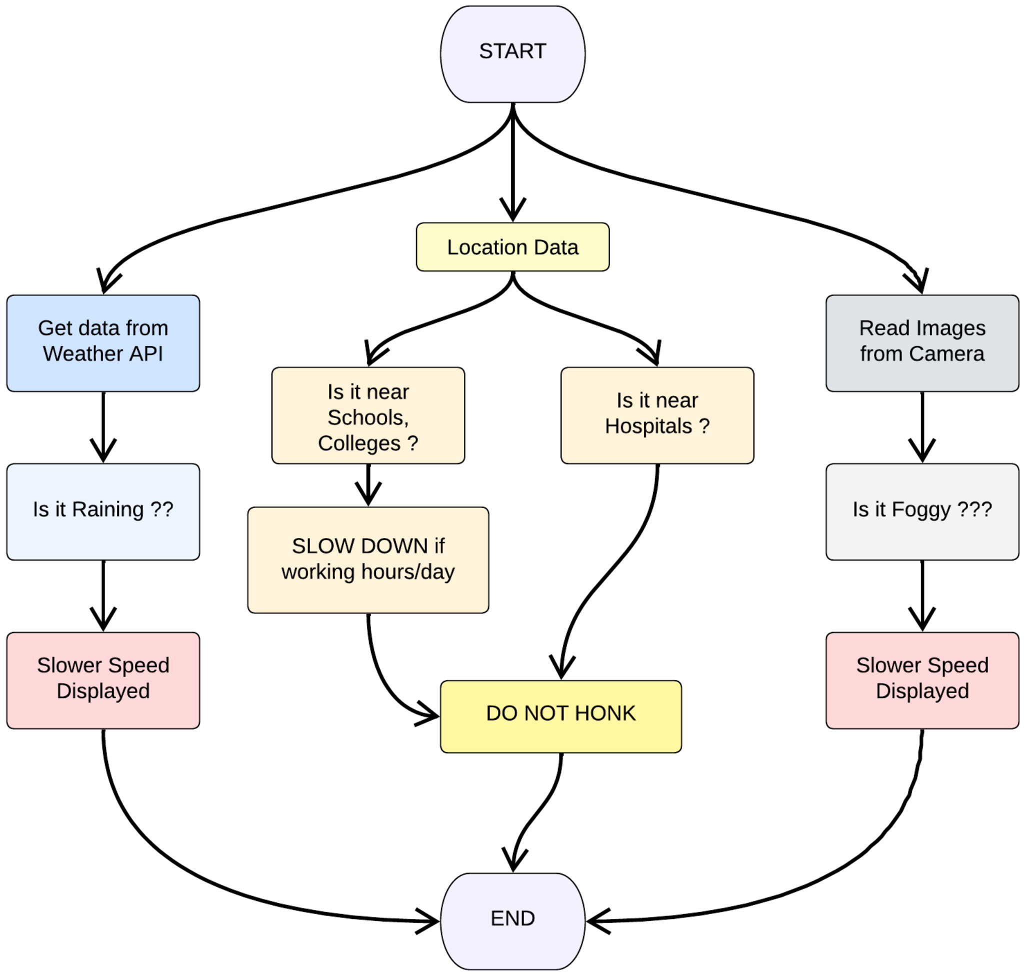
|---|---|
| Date | 07 September 2022 |
| Team ID | PNT2022TMIDI3488 |
| Project Name | Project - Signs with smart connectivity for Better road safety |
| Maximum Marks | 4 Marks |

# 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

```
# Python code
importrequestsasreqs
defget(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_inrange(len(responseJSON['weather']))],
"visibility" : responseJSON['visibility']/100, # visibility in percentage where 10km is
100% and 0km is 0%
}
if("rain"inresponseJSON):
returnObject["rain"] = [responseJSON["rain"][key] forkeyinresponseJSON["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
importweather
fromdatetimeimportdatetimeasdt
# IMPORT SECTION ENDS
# -----------------------------------------------
# UTILITY LOGIC SECTION STARTS
defprocessConditions(myLocation,APIKEY,localityInfo):
weatherData=weather.get(myLocation,APIKEY)
finalSpeed=localityInfo["usualSpeedLimit"]
if"rain"notinweatherDataelselocalityInfo["usualSpeedLimit"]/2
finalSpeed=finalSpeedifweatherData["visibility"]>35elsefinalSpeed/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_inlocalityInfo["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**

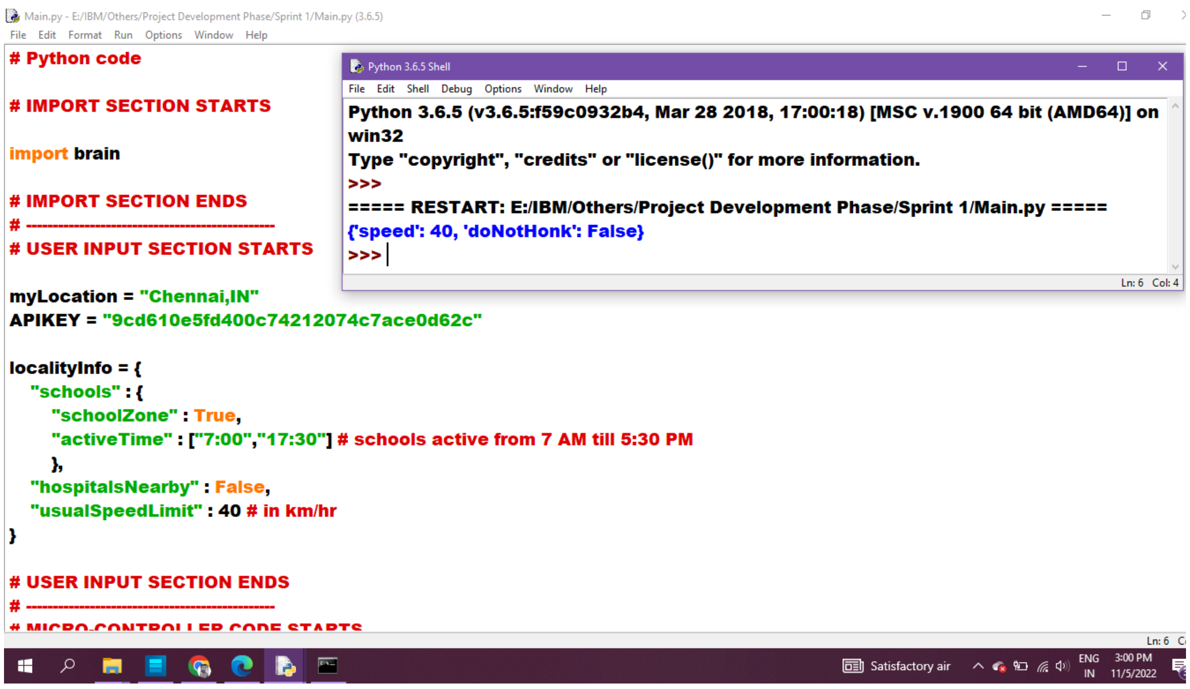
The code that runs in a forever loop in the microcontroller. This calls all the util functions from other python files and based on the return value transduces changes in the output hardware display.

```
# Python code
# IMPORT SECTION STARTS
importbrain
# IMPORT SECTION ENDS
# ---------------------------------------------
# USER INPUT SECTION STARTS
myLocation="Chennai,IN"
APIKEY="9cd610e5fd400c74212074c7ace0d62c"
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}



Main.py - E:/IBM/Others/Project Development Phase/Sprint 1/Main.py (3.6.5)
File Edit Format Run Options Window Help
Python 3.6.5 Shell
File Edit Shell Debug Options Window Help
Ln: 6 Col: 4
Satisfactory air
ENG IN
3:00 PM 11/5/2022

```
# Python code

# IMPORT SECTION STARTS

import brain

# IMPORT SECTION ENDS
# -----------------------------------------------
# USER INPUT SECTION STARTS

myLocation = "Chennai,IN"
APIKEY = "9cd610e5fd400c74212074c7ace0d62c"

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
# -----------------------------------------------
```

```
Python 3.6.5 (v3.6.5:f59c0932b4, Mar 28 2018, 17:00:18) [MSC v.1900 64 bit (AMD64)] on
win32
Type "copyright", "credits" or "license()" for more information.
>>>
===== RESTART: E:/IBM/Others/Project Development Phase/Sprint 1/Main.py =====
{'speed': 40, 'doNotHonk': False}
>>>
```