Project Development Phase
Project Development Delivery of Sprint 1

Date	16 September 2022
Team ID	PNT2022TMID16025
Project Name	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.

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}