SPRINT 02

SIGNS WITH SMART CONNECTIVITY FOR BETTER ROAD SAFETY

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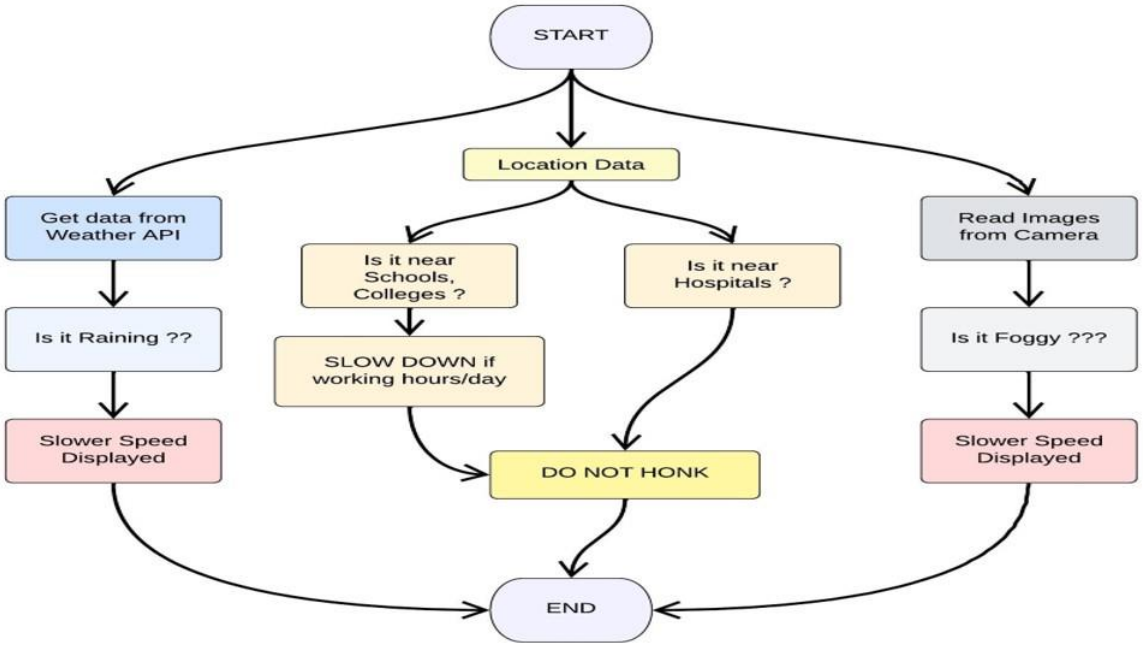
SPRINT GOALS:

1. Push data from local code to cloud.

CODE FLOW:



PROGRAM CODE:

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={AP
I KEY}"

   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)
```

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
from publishData import logData2Cloud as log2cloud

# IMPORT SECTION ENDS
# -----------------------------------------------
# UTILITY LOGIC SECTION STARTS def
processConditions(myLocation,APIKEY,localityInfo):
    weatherData = weather.get(myLocation,APIKEY)
  log2cloud(myLocation,weatherData["temperature"],weatherData["visibility"])

   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
```

PUBLISHDATA.PY:

THIS SECTION PUSHES THE DATA TO THE CLOUD AND LOGS THE DATA.

```
# Python code


# IMPORT SECTION STARTS


import wiotp.sdk.device # python -m pip install wiotp
import time
```

```
# IMPORT SECTION ENDS

# -----------------------------------------------

# API CONFIG SECTION STARTS


myConfig = {
    "identity" : {
        "orgId" : "f59trs",
        "typeId" : "testdevice",
        "deviceId" : "device1"
    },
    "auth" : {
        "token" : "Jrwa7c8Os2Zpq)WW18"
    }
}


# API CONFIG SECTION ENDS

# -----------------------------------------------

# FUNCTIONS SECTION STARTS
```

```
def myCommandCallback(cmd):
    print("recieved cmd : ",cmd)



def logData2Cloud(location,temperature,visibility):
    client = wiotp.sdk.device.DeviceClient(config=myConfig,logHandlers=None)
    client.connect()
    client.publishEvent(eventId="status",msgFormat="json",data={
        "temperature" : temperature,
        "visibility" : visibility,
        "location" : location
    },qos=0,onPublish=None)
    client.commandCallback = myCommandCallback
    client.disconnect()
    time.sleep(1)


# FUNCTIONS 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


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 3 AS PER OUR PLANNED SPRINT SCHEDULE

'''


# MICRO-CONTROLLER CODE ENDS
```

OUTPUT:

```
# Code Output

# Code Output

22022-11-08 22:57:43,506   wiotp.sdk.device.client.DeviceClient  INFO    Connected successfully: d:f59trs:testdevice:device1

2022-11-08 22:57:43,574   wiotp.sdk.device.client.DeviceClient  INFO    Disconnected from the IBM Watson IoT Platform

2022-11-08 22:57:43,580   wiotp.sdk.device.client.DeviceClient  INFO    Closed connection to the IBM Watson IoT Platform

{'speed': 20.0, 'doNotHonk': False}

.
```

.

.

... repeats every 1 sec

IMAGES:

pycode.py - C:\Users\god\AppData\Local\Programs\Python\Python311\pycode.py (3.11.0)

File Edit Format Run Options Window Help

```
# 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
#while True:
print(brain.processConditions(myLocation,APIKEY,localityInfo))

'''
MICRO CONTROLLER CODE WILL BE ADDED IN SPRINT 3 AS PER OUR PLANNED SPRINT SCHEDULE
'''

# MICRO-CONTROLLER CODE ENDS
```

```
2022-11-08 22:50:03,725   wiotp.sdk.device.client.DeviceClient  INFO    Connected successful
ly: d:f59trs:testdevice:device1
2022-11-08 22:50:03,741   wiotp.sdk.device.client.DeviceClient  INFO    Disconnected from th
e IBM Watson IoT Platform
2022-11-08 22:50:03,741   wiotp.sdk.device.client.DeviceClient  INFO    Closed connection to
the IBM Watson IoT Platform
{'speed': 20.0, 'doNotHonk': False}
>>>
```