Project Definition Phase I

Project Objectives (Phase I)

1. To gain experience with the design and development of a relatively larger software project
2. To gain practical experience in OOP design and development, interacting with a data base and GUI implementation.
3. To gain the experience of real-world data analysis.
4. To use engineering tools (python packages) to design and analysing engineering problems

Phase I (GUI and DataBase)

The purpose of the first phase of the project is to get familiar with the python Graphic User Interface (GUI) and use a database for keeping required data.

In the first phase, you will write a GUI application that manages traffic information from Calgary city. The required data is available on Calgary city website (https://data.calgary.ca/browse?sortBy=newest).

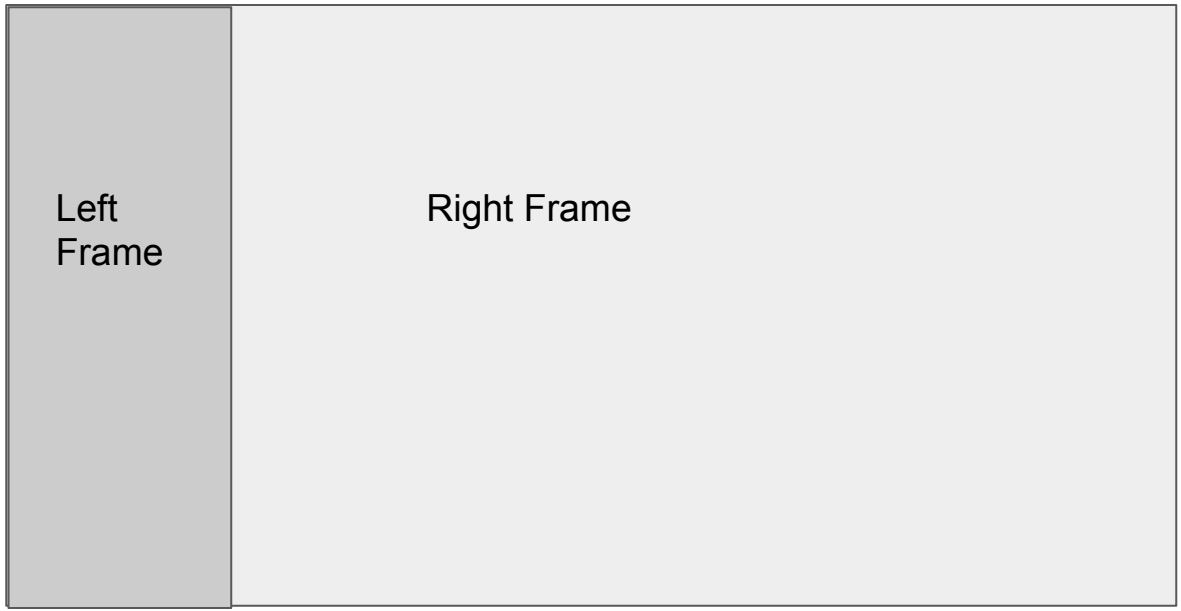
GUI

The python GUI that you are developing must have the following functionalities:

- It should be able to read and write the traffic information from/to database and keep it in the right data structure
- It should be able to display the traffic records information on the computer screen.
- The user should be able to select type of information and corresponding year for doing analysis.
- You should be able to load the calgary city map and you should be able to show the maximum traffic volume or accident based on the year on the map.

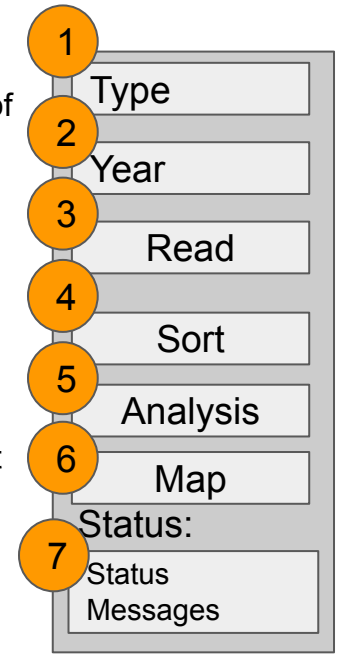
System Design

The GUI must have two frames: the left frame is control frame which includes buttons and gets input from user, the right frame is for drawing the table of information and the statistics that we need to visualize.

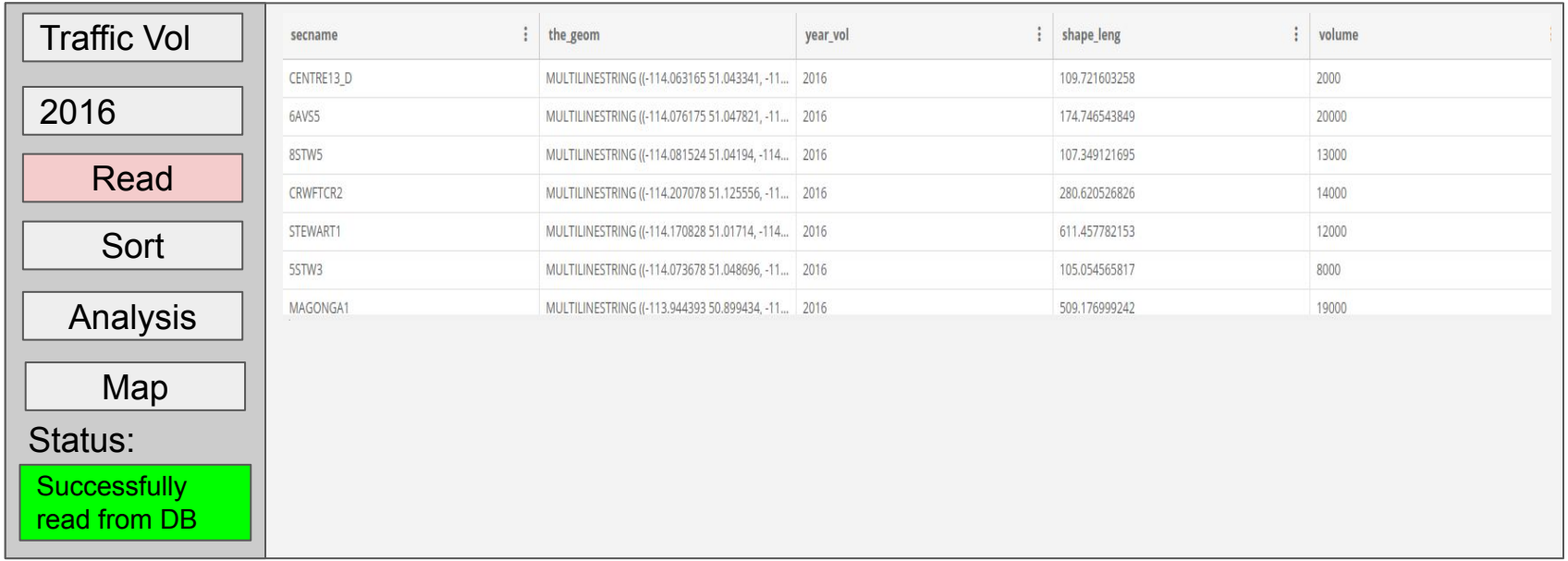


System Design (Left Frame Functionality)

1. It must include two rows: accident and Traffic Volume (Type Combobox)
2. It must keep the information of the years that we have accident and traffic data (Type Combobox (2016, 2017, 2018))
3. According to type and year, it must read the corresponding data and print a table of rows in right_frame (Type Button)
4. It must sort data based on the maximum traffic volume or maximum accident. (Type Button)
5. It must draw a chart in right frame which draws the maximum number of accidents and traffic volume according to the year (Type Button)
6. Map should write the map of Calgary in map.html file and marks the section that has the maximum accident or traffic volume. (Type Button)
7. It should show the status of system any error in reading database or drawing chart should be printed in this message bar. (Type Label)

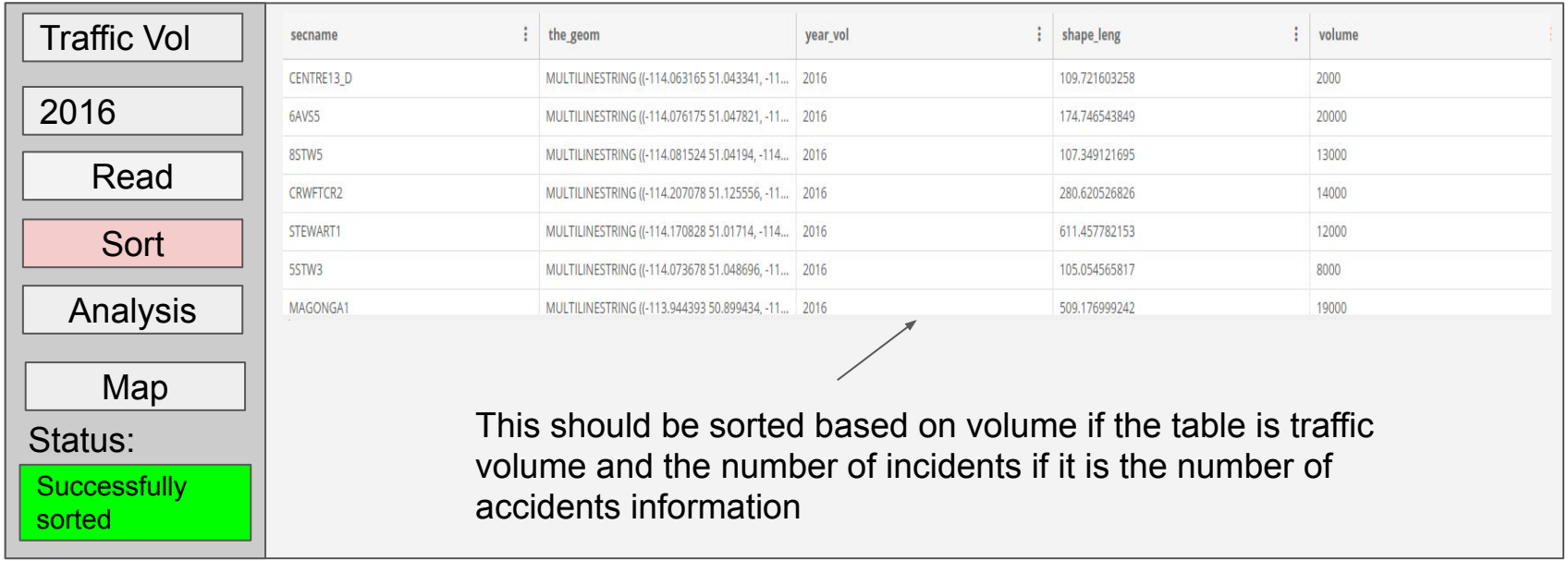


Example Setting for left frame and right frame data display (Read Button)

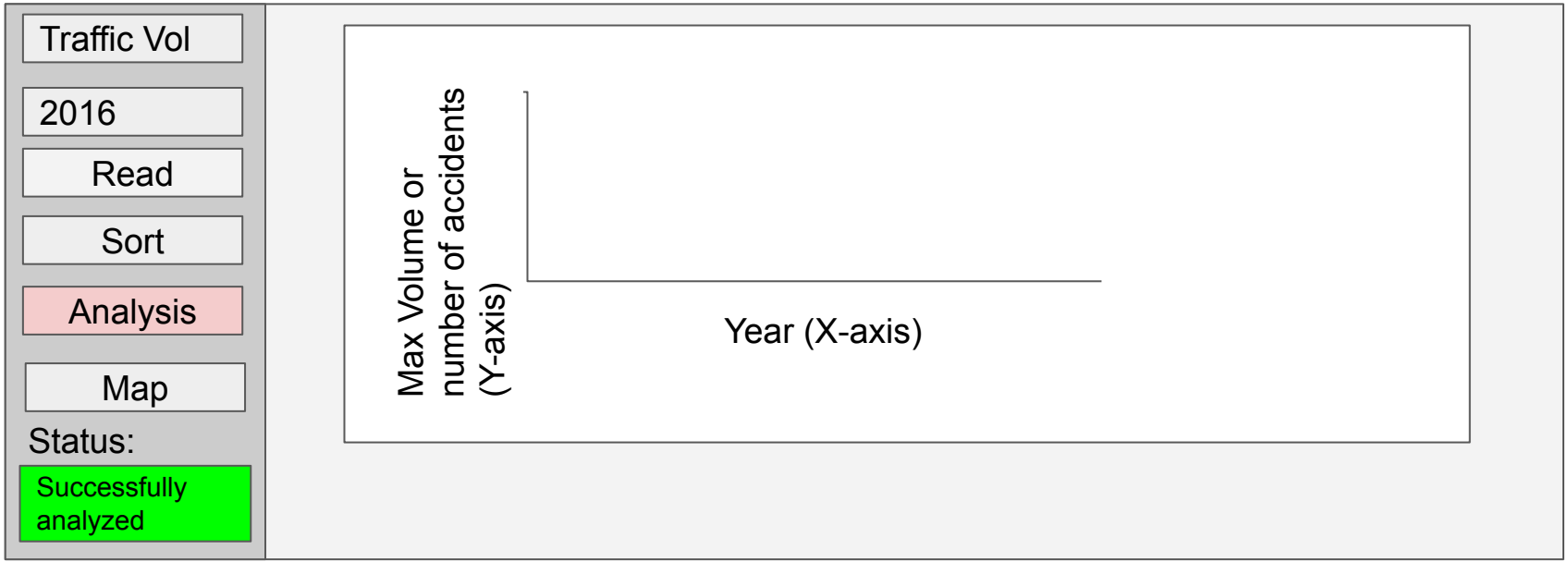


secname	the_geom	year_vol	shape_leng	volume
CENTRE13_D	MULTILINESTRING ((-114.063165 51.043341, -11...	2016	109.721603258	2000
6AVS5	MULTILINESTRING ((-114.076175 51.047821, -11...	2016	174.746543849	20000
8STW5	MULTILINESTRING ((-114.081524 51.04194, -114...	2016	107.349121695	13000
CRWFTCR2	MULTILINESTRING ((-114.207078 51.125556, -11...	2016	280.620526826	14000
STEWART1	MULTILINESTRING ((-114.170828 51.01714, -114...	2016	611.457782153	12000
5STW3	MULTILINESTRING ((-114.073678 51.048696, -11...	2016	105.054565817	8000
MAGONGA1	MULTILINESTRING ((-113.944393 50.899434, -11...	2016	509.176999242	19000

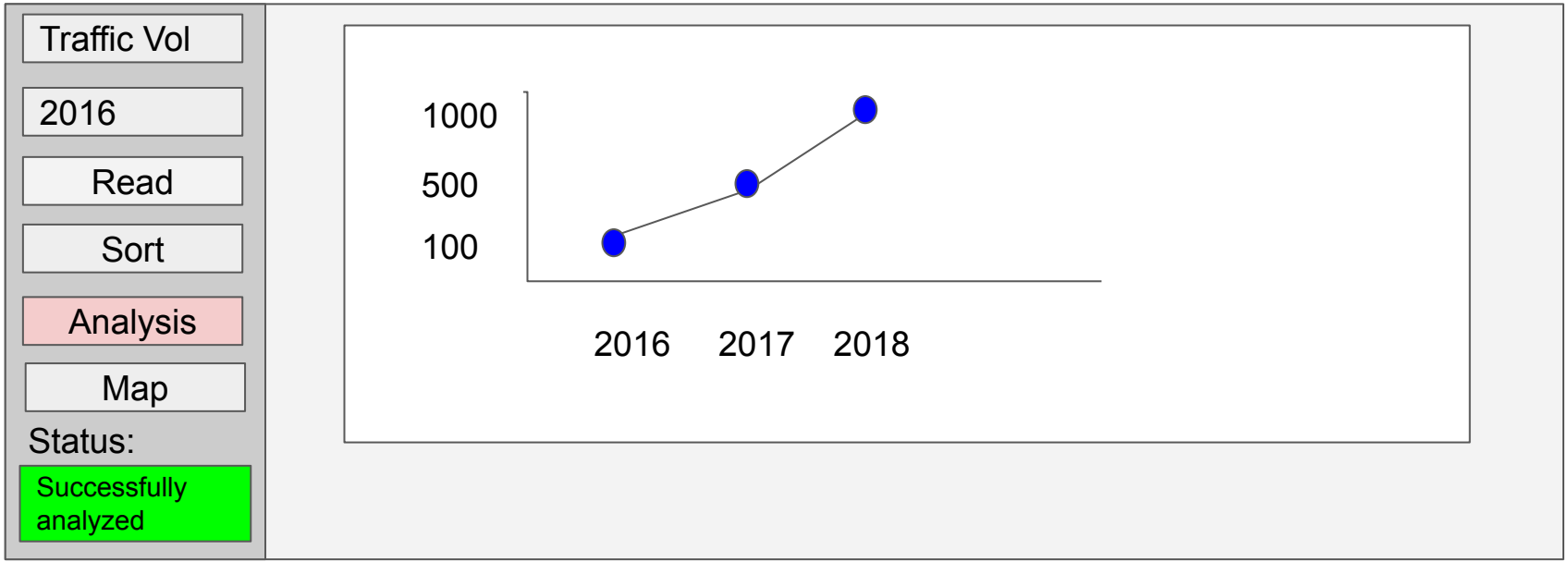
Example Setting for left frame and right frame data display (Sort Button)



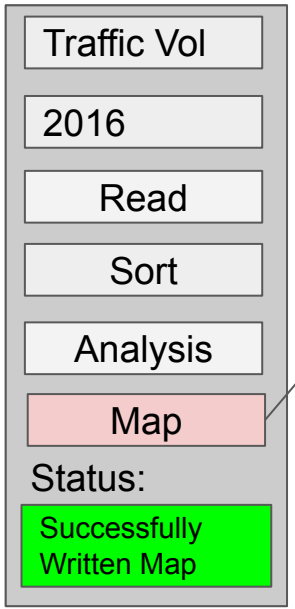
Example Setting for left frame and right frame data display (Analysis Button)

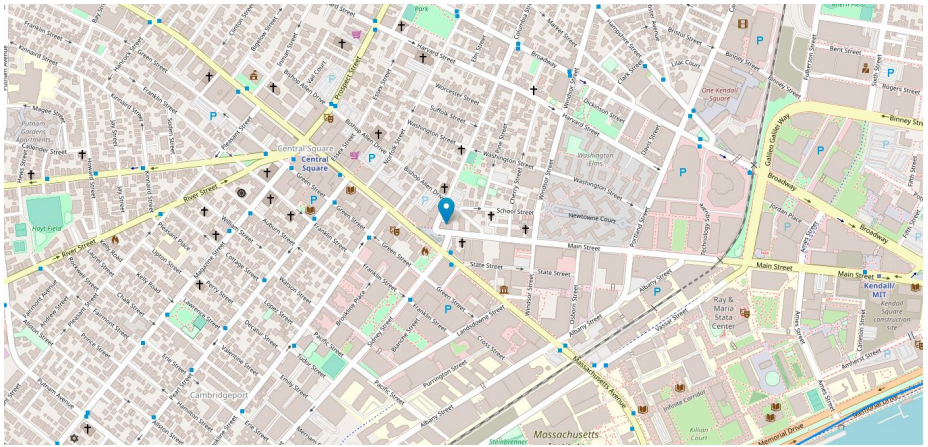


Example Setting for left frame and right frame data display (Analysis Button)



Example Setting for left frame and right frame data display (Analysis Button)





Must write an html file called map.html which includes the map of calgary city and the location that have the maximum accident or traffic

Packages

Here is the suggestion of some packages you can use for the project:

- Database: Mongodb
- GUI: tkinter
- Drawing map: folium

You are free to use any other types of packages and modules for database, gui, and drawing map.

Marking

- Read and write to the database: 5 Marks
- Sort the data and find the max value: 5 Marks
- Analyzing data and drawing chart: 5 Marks
- Map drawing and writing the map.html: 5 Marks
- Project Demo: 5 Marks
- Total Mark: 25 Marks
- **Due date: 23 July-2020**