

Project 2 - A Demo of Map Navigation System

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Overview

To better understand some important algorithms based on graphs, this project requires you to implement a demo of map navigation system.

Requirements

Implementation

1. Implement a map navigation system using GUI. You should use the specified map. The map is provided in folder "data". See "README.txt" for detailed explanation.
2. Important locations are marked in "tagged.png". You can consider them as vertices of the graph.
3. The map contains different kinds of paths, including walk and vehicle. For vehicle paths, both two way streets and one way streets exist. A one way street is a street facilitating one way traffic, which is a traffic that moves in a single direction. This kind of paths is also provided in the file.
4. Your system should contain **three modes**:
(1) Walking (2) Driving (3) Bus
And the following **three methods** in each mode:
(1) Given two locations, show the shortest path from one to the other on the map and its length.
(2) Given one location, show the length of the shortest path to this location from every other location in a text file.
(3) Just show the length of shortest path from every two locations in a text file.
Note: In bus mode, the shortest path means the path that costs the least time.
5. Since the scale of the map in this demo is unlikely to be very large, performance is not a very important factor. It is okay as long as your algorithms is not too slow.
6. **Other effective implementations or useful functions may be considered in bonus. You can refer to real-world navigation software features. (e.g. calculating the return route, collecting route)**

Documentation

After finishing coding, you should write a documentation describing how you finish this project. The document should contain at least the following things:

1. Tell how to use the system.
2. Show that which algorithm is used in each function and why.

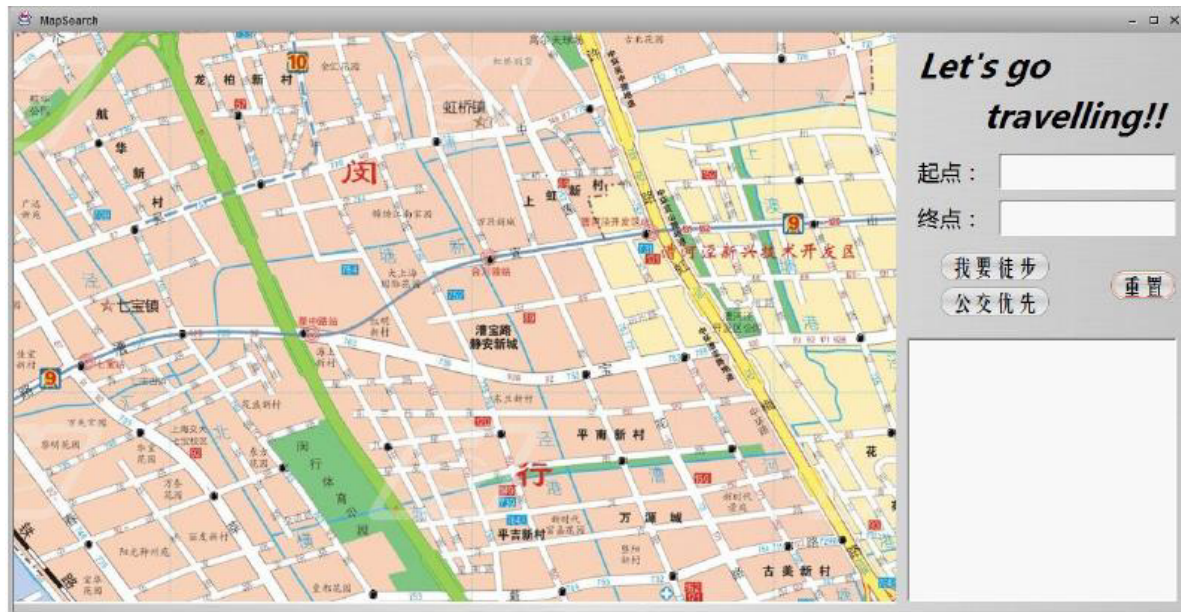
If you have other things like creative thoughts, you are welcome to write them in the document.

Design

The GUI should contain two parts, one for the map and the other for operations. The important locations should be marked with red points on the map. Users can choose walk, drive or bus in the operation part. When the shortest path is found, it should be marked with green lines.

If you can choose a point by clicking the map, it will be considered in bonus.

A GUI example is provided as follows. (You should change the map part with the given map)



Submission

Please put all your source codes, required documents, and an executable file into a zip file with file name **StudentID-Name.zip** and upload it to FTP server before **2019/12/1 23:59 (GMT+08:00)**. Besides, a face-to-face interview is also required to grade your project, so please remember to make an appointment for your interview after finishing. The deadline for interview is **2019/12/4**.

Grading

Content	Points
General implementation	20
Method 1	15
Method 2	15
Method 3	15
Graphical User Interface	10
Document	20
Coding Style	5
Bonus	10 extra