



| | routeRequestHandler | | MapLoader | laneletMap | | routePlanner | pathGenerator | |
|---|---------------------|-----------------|-----------|------------|---------------------|--------------|----------------|----------------|
| | getUserInput() | validateInput() | | loadMap() | getNearestLanelet() | | computeRoute() | generatePath() |
| 1 | | | Yes | | | | | |
| 2 | | | Yes | | | | | |
| 3 | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| 4 | | | | Yes | | Yes | Yes | Yes |
| 5 | | | | Yes | Yes | | | |
| 6 | Yes | Yes | | | | | | |

Senior Design Single Responsibility and Open/Closed Principle

RouteRequestHandler class

Its single responsibility is to handle user input for route requests. One reason to change it so we have predefined pick-up and drop-off locations. To extend this class, we can change the input method so that it comes from another class.

MapLoader class

Its single responsibility is to load and parse map data from an OSM file. One reason to change is if the file type/map changes. To extend this class, we can add a subclass that loads maps from other formats.

LaneletMap class

Its single responsibility is to handle lanelet data like getting each lanelet and finding the nearest lanelet for pathfinding in another class. One reason to change is if the map data changes. To extend this class, we can add new functions that add new query features and analyze the data.

RoutePlanner class

Its single responsibility is to handle computing routes between two lanelets based on traffic rules. One reason to change is if the routing algorithm changes. To extend this class we can define different rule sets by subclassing.

PathFinder class

Its single responsibility is to extract the coordinates from a computer route. It doesn't plan or validate it just converts route into usable path points. One reason to change is if the format or structure of the output needs to change. To extend this class we can add a new method to export the path differently or add processing options.