

Documentation for Traffic Management System

Overview

The Traffic Management System is a Java program designed to manage traffic operations involving multiple roles: Owner, Admin, and Traffic Officer. The system allows these roles to interact with traffic data, record violations, view violations, and manage traffic lights.

Classes and Their Responsibilities

- **Main Class:**
 - Initializes vehicles and reads data from files.
 - Provides a menu for the user to select their role (Owner, Admin, Traffic Officer).
 - Routes user input to the appropriate actions based on their role.
- **Vehicle Class:**
 - Represents a vehicle with properties like ID, type, and other details.
 - Methods to read and save vehicle data from/to files.
- **Admin Class:**
 - Provides functionalities for the admin to add, update, delete traffic lights, view violations, and generate traffic reports.
 - Methods to read and save traffic light data from/to files.
- **TrafficOfficer Class:**
 - Allows the traffic officer to record and view violations.
 - Methods to read and save violation data from/to files.
- **Owner Class:**
 - Allows the owner to log in, view violations, pay for violations, and check certain conditions.
- **Notification Class:**
 - Handles sending notifications (Implementation not provided in the original code).
- **Notification System Class:**
 - Managing notifications related to traffic violations. It facilitates creating, sending, saving, and loading notifications and integrates with other components like `TrafficOfficer`, `Owner`, and `Vehicle`.

Key Methods and Functionalities

- **readTrafficLightsFromFile(String filePath):** Reads traffic light data from a specified file.
- **readViolationsFromFile(String filePath):** Reads violation data from a specified file.
- **readVehiclesFromFile(String filePath):** Reads vehicle data from a specified file.
- **readOwnersFromFile(String filePath):** Reads Owners account data from a file
- **loadNotificationsFromFile(String fileName):** Reads Notifications data from a file
- **saveTrafficLightsToFile(ArrayList list, String filePath):** Saves traffic light data to a specified file.
- **saveViolationsToFile(ArrayList list, String filePath):** Saves violation data to a specified file.
- **saveVehiclesToFile(ArrayList list, String filePath):** Saves vehicle data to a specified file.
- **saveOwnersToFile(String filePath):** Saves Owners accounts to a file
- **saveNotificationsToFile(String fileName, ArrayList notifications):** Saves Notifications data to a file
- **login():** Allows the owner to log in.
- **viewViolations():** Allows viewing of violations.
- **payViolation():** Allows the owner to pay for a violation.
- **check():** Checks specific conditions (Details not provided).
- **addTrafficLight():** Admin can add a new traffic light.
- **updateTraffic():** Admin can update an existing traffic light.
- **delete():** Admin can delete a traffic light.
- **generateReport():** Admin can generate traffic reports.
- **record():** Traffic Officer can record a violation.

UML Diagram

