OOD1 Exercise

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This is the GitHub link for all the codes:

https://github.com/feedme007/Software-Engineering-UPC-Codas/tree/main/Assignment-3(OOD-1)

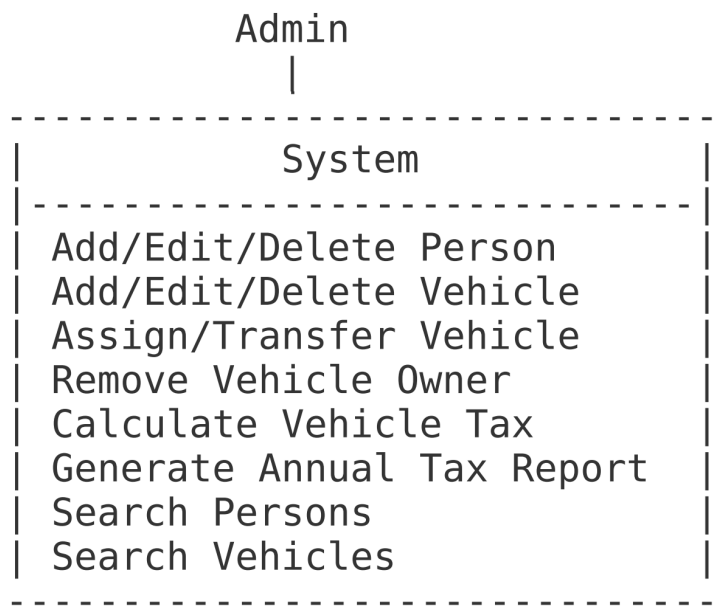
1) Use cases

- **Add Person**
  Actor: Admin
  Goal: Store a new person with license number, name, surname, address.
  Main flow: Admin enters data -> system saves if license is unique.
- **Edit Person**
  Actor: Admin
  Goal: Update name/surname/address of an existing person.
  Main flow: Admin selects person by license -> edits fields -> system saves.
- **Delete Person**
  Actor: Admin
  Goal: Remove a person.
  Main flow: Admin selects person -> system deletes and clears ownership on any vehicle they owned.
- **Add Vehicle**
  Actor: Admin
  Goal: Store a new vehicle (car or motorcycle) with plate, maker, model, and technical data.
  Main flow: Admin enters data -> system saves if plate is unique.
- **Edit Vehicle**
  Actor: Admin
  Goal: Update maker/model and the specific data (displacement or CO_2/fuel).
  Main flow: Admin selects vehicle by plate -> edits fields -> system saves.
- **Delete Vehicle**
  Actor: Admin
  Goal: Remove a vehicle from the system.
  Main flow: Admin selects vehicle by plate -> system deletes.
- **Assign/Transfer Vehicle**
  Actor: Admin
  Goal: Set or change the owner of a vehicle.
  Main flow: Admin selects plate and target license -> system sets owner (can be null to remove owner).
- **Calculate Vehicle Tax**
  Actor: System (on request)
  Goal: Compute the annual tax for a single vehicle.
  Rules:

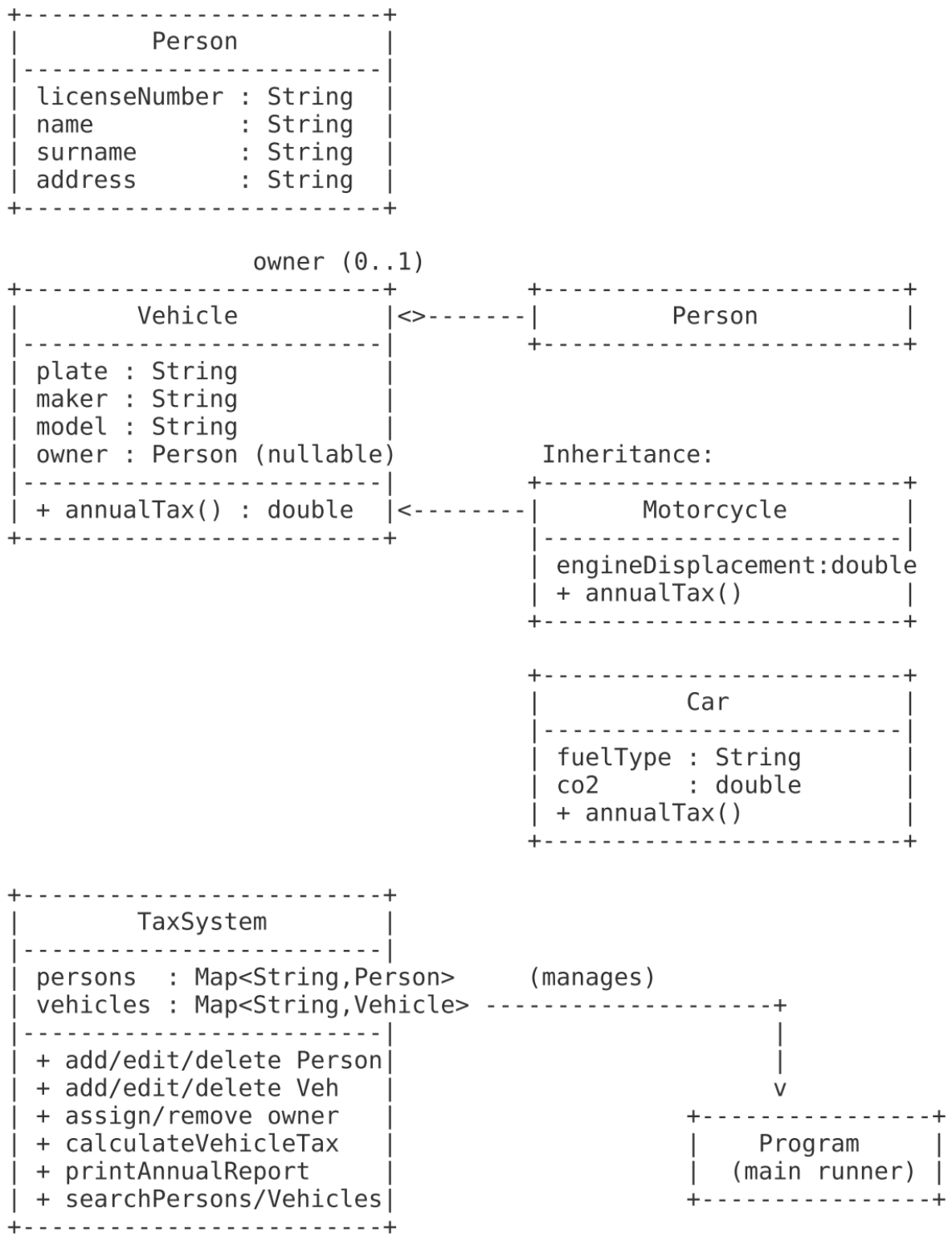
Motorcycle -> 0.10 × displacement
Petrol car -> 1.4 × CO_2
Diesel car -> 1.8 × CO_2
Hybrid car -> 1.2 × CO_2

- **Generate Annual Taxes Report**
  Actor: Admin
  Goal: List each owner, their vehicles, per-vehicle tax, total per owner, plus vehicles without owner.
- **Search Persons / Search Vehicles**
  Actor: Admin
  Goal: Keyword search on persons (license/name/surname/address) and vehicles (plate/maker/model).

1) Use cases Diagram



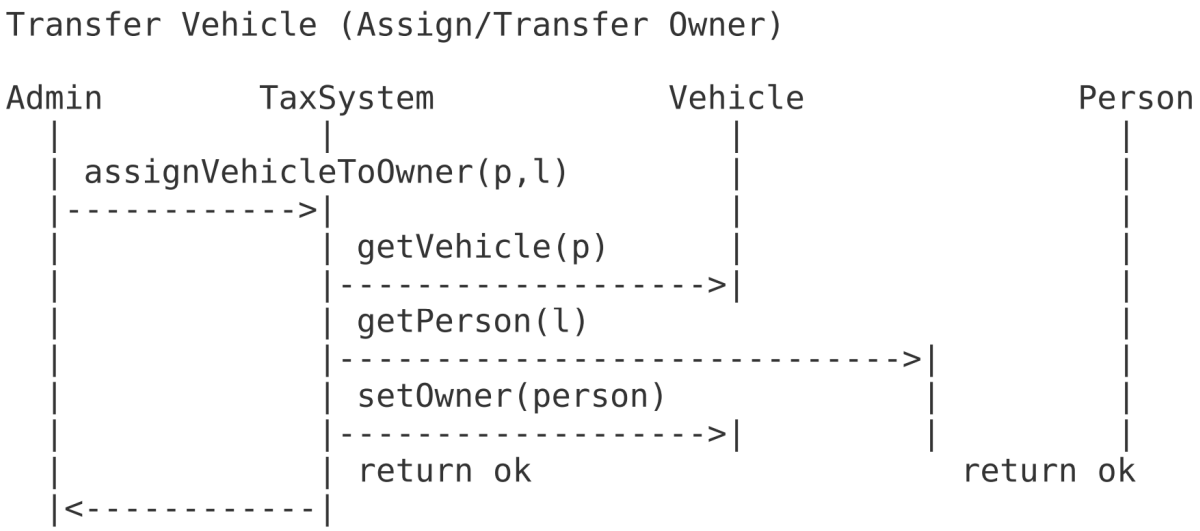
2) Class Diagram



- Vehicle is abstract;
- Car and Motorcycle override annualTax()
- owner can be null

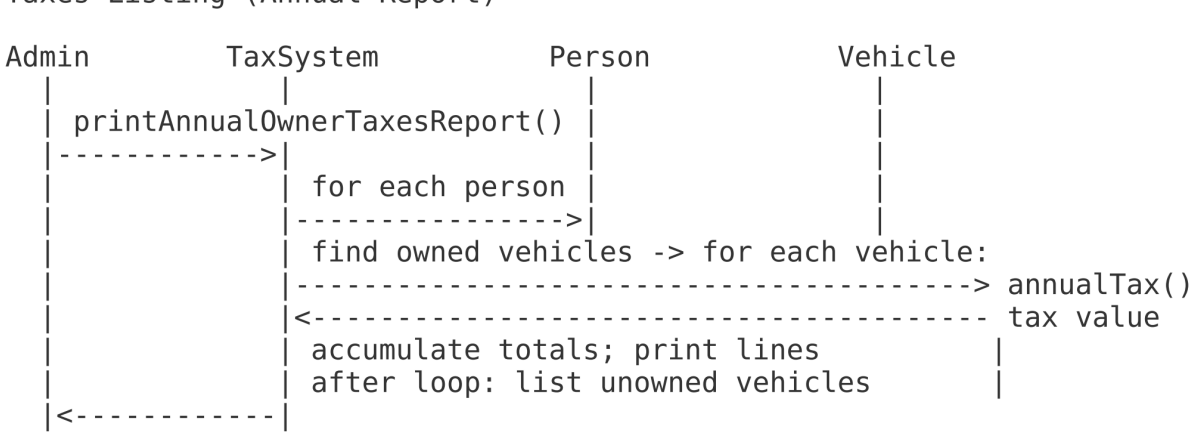
3) Sequence Diagram

a) Transfer Vehicle (assign/transfer owner)



Vehicle's owner points to the selected person (or null if removing).

b) Taxes listing (annual report)



Per-owner vehicle list with tax per vehicle, total per owner, then vehicles without owner.

4) Implementation in Java

The following files contain the full implementation, and they are attached in this repository: https://github.com/feedme007/Software-Engineering-UPC-Codas/tree/main/Assignment-3(OOD-1)

- Person.java
- Vehicle.java
- Motorcycle.java
- Car.java
- TaxSystem.java
- Program.java