Vehicle Rental Application – Specifications

The database application that you will be considering for the first few tutorials is for a typical car rental company called **SuperRent** or simply "**the company**" or "**the store**". The rest of this section provides a detailed description of the basic operations performed by the users of this system.

The main function of SuperRent is to rent cars and trucks to its customers. The company keeps a number of offices in a variety of cities and locations within each city. Each location maintains a number of cars and trucks. The car types include: Economy, Compact, Mid-size, Standard, Full-size, Premium, Luxury, SUV, and Van. Truck types include 24-foot, 15-foot, 12-foot, Box Trucks, and Cargo Vans. Each type has different features such as a different number of seats; different daily, weekly, and hourly rates; different per-kilometer-rates (charged for kilometers driven above a set limit); and different weekly, daily, and hourly insurance coverage.

SuperRent maintains a list of all its customers. When a customer first rents a vehicle, the company records the customer name, address, and email. A customer is identified by their customerID that is generated upon creation. The company also maintains a list of the SuperRent Club members. To become a SuperRent Club member, a customer needs to fill in an application with their name and address and pay the annual fee determined by the company. When a customer first joins the club, they get 500 points. After that, a club member gains 1 point for every $5 they spend. A customer can exchange 1000 points for a one-day rental of a premium or lower-ranking car, or they can exchange 1500 points for a one-day rental of a luxury car, SUV, van, or truck.

A customer can reserve a vehicle for specific days, can rent a vehicle, or return the vehicle that they have rented. To make a reservation, a customer provides the location, the type of the vehicle, and the date and time for which they would like to pick up and return the vehicle. If there is a vehicle of the requested type available in that location, the system asks the customer for any additional options and shows an estimate of the cost. The customer can then proceed and make a reservation or cancel it. To make a reservation, the customer provides their customerID, and the system prints a confirmation number. To cancel a reservation, a customer must provide either the confirmation number, or their customerID and the dates.

There are two options for "additional equipment" that is available for each car or SUV: a ski rack and a child safety seat. The additional equipment available for a truck consists of a lift gate and car-towing equipment. There is no weekly rate for the additional equipment; the rental charge for any additional equipment is always calculated by the daily and hourly rates.

To rent a vehicle, a customer provides the same information that is required for a reservation. If a customer has already made a reservation, they only need to provide the confirmation number or their customerID if a confirmation number has not been generated. The system gets the rest of the information from the reservation record. To complete the rental agreement, a customer

has to provide their driver's license number and credit card information consisting of the card number and expiry date. SuperRent accepts only American Express, MasterCard, and Visa.

When a customer returns a vehicle the clerk enters the date, the time, the odometer reading, and whether the gas tank is full. The system calculates the charges by applying weekly rates to whole weeks, daily rates to remaining days, and hourly rates to additional hours. It calculates the insurance cost in a similar manner taking into account the insurance rates for the vehicle. If the customer is a club member and has enough points, it uses the points to reduce the cost. In addition, if the customer is a "Road Star" (a designation given to drivers by the insurance corporation), then the customer pays for insurance at 50% of the regular insurance rates. To pay their bill, customers can use their credit card or cash.

SuperRent maintains a fleet of fairly new cars. Every year the managers sell a number of cars to customers or to car dealers, and they buy new cars. When they decide to sell a car, the car is removed from the list of the cars that can be rented, and the car is advertised for sale.

In addition to the transactions mentioned above, the system must be able to generate a number of reports. At the end of each day, the company wants to produce the following reports:

- Daily Rentals: This report contains information on all the vehicles rented out during the day. The entries are grouped by branch; and within each branch, the entries are grouped by vehicle category. The report also displays the number of vehicles rented per category (e.g., 5 sedan rentals, 2 SUV rentals, etc.), the number of rentals at each branch, and the total number of new rentals across the whole company.
- Daily Rentals for Branch: This is the same as the Daily Rental report, but it is for one specified branch.
- Daily Returns: The report contains information on all the vehicles returned during the day. The entries are grouped by branch, and within each branch, the entries are grouped by vehicle category. The report also shows the number of vehicles returned per category, the revenue per category, subtotals for the number of vehicles, the revenue per branch, and the grand totals for the day.
- Daily Returns for Branch: This is the same as the Daily Returns report, but it is for one specified branch.

The system you design will be used by three types of users:

- Customer: can make reservations, can apply for the Club membership, and can check the number of points that they have accumulated.
- Clerk: processes all the customer services, like renting a vehicle, returning a vehicle, etc.
- Manager: buys new vehicles, sells the old vehicles, and sets all the rates and costs.

In addition to those defined above, there are a number of simple queries that a clerk of the company should be able to ask. Clerks should be able to:

- Show the vehicles of a specified category that are available in a given location for a given set of dates (usually given as from-date and to-date).
- Show the vehicles in a specified location and category that are overdue.
- Show the vehicles in a specified location and category that are for sale and their sale prices.

If the category is not specified, vehicles in all categories are shown, grouped by category. If the branch is left out, vehicles from all branches are shown, grouped by branch.

Finally, managers must be able to perform the following tasks:

- Show the vehicles in a specified location and category that are older than a specified number of years. If the location or category is left out, all qualifying vehicles are shown grouped by category and/or location.
- Remove a number of vehicles from the for-rent list and move them to the for-sale list.
- Sell a vehicle to a customer or dealer.
- Add more vehicles.

When a user starts the system, the program asks the user for an ID and a password. Then the system starts up the appropriate menu for the current type of user. A system administrator can access all the menus, add users, remove users, and change users' passwords at any time.

Note:

The requirements stated herein are not expected to be complete. As you start analyzing these requirements, you may notice that certain details are missing. In this case, you may make reasonable assumptions about them, but if there is any uncertainty you should discuss it with the instructors or the TAs. **When in doubt, follow the Tutorial's specific specifications over what is written here.**