

Project Description

The database system that you are to implement in this project is for a typical Car Renting 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 the database 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, SUV, and Truck. For each of these car types, the vehicle may be a regular gasoline car, a hybrid vehicle, or a fully electric vehicle. Each car type has different: features; hourly, daily, and weekly rates; per-kilometer-rates (charged for kilometers driven above the limit); and hourly, daily, and weekly insurance coverage. Furthermore, if a vehicle is a hybrid or a fully electric vehicle, there is an additional battery surcharge per rental – independent of the mileage driven.

SuperRent maintains a list of all their customers. When a customer first rents a vehicle, the company records the customer name, address, and cell phone number (with the area code). A customer is usually identified by their phone number. 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. A club member gains 1 point for every \$10 she/he spends. A customer can exchange 5000 points for a one-day rental of a hybrid or a fully electric vehicle.

A customer can reserve a vehicle for specific days, rent a vehicle, or return the vehicle that she/he has rented. To make a reservation, a customer provides the location, the type of the vehicle, and the day and time for which she/he 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 estimation of the cost. The customer can then proceed and make a reservation or cancel it. To make a reservation, the customer provides her/his name and phone number, and the system prints a confirmation number. To cancel a reservation, a customer must provide either the confirmation number or their phone number and the dates.

There are two options for "additional equipment" that is available for each car which is not a truck: a ski rack and/or one or more child safety seats. The additional equipment available for a truck consists of a lift gate and a car-towing equipment. There is no weekly rate for the additional equipment. The rental charges for any additional equipment are always calculated by the daily and hourly rates.

To rent a vehicle, a customer provides the same information as that required for a reservation. If a customer has already made a reservation, she/he needs only to provide the confirmation number or their phone number. The system gets the rest of the information from the

reservation record. To complete the rent 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 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 the weekly rate to whole weeks, daily rate to remaining days, and hourly rate to additional hours. It calculates the **insurance cost** in a similar manner by taking into account the insurance rates for the vehicle. In addition, if the customer is a "Road Star" (a designation given to drivers by the insurance corporation), the customer has a 50% discount off 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 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 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 and 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 user:

- Customer: can make reservations, can apply for the Club membership, and check the points she/he has accumulated.
- Clerk: a typical clerk who processes all the customer actions, 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 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 and the vehicles are grouped by category. If the branch is left out, vehicles from all branches are shown and the vehicles are 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 in 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 and can add and remove users and change their 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 any reasonable assumptions about them, but if there is any uncertainty you should discuss it with the instructors or the TAs.