Case Study 1

The database system that you are to implement in this project is for a typical Car Rental Company called **SuperRent.** 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, different daily, weekly and hourly rates, and different per-kilometer-rates (charged for kilometers driven above the limit), and different weekly. daily and hourly insurance coverage.

SuperRent maintains a list of all their customers. When a customer first rents a vehicle, the company records the customer name, address, 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. When a customer first joins the club, she/he gets 500 points. After that, a club member gains 1 point for every $5 she/he spends. A customer can exchange 1000 points for a one- day rent of a premium or lower-ranking car, or they can use 1500 points for a one-day rent 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 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 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.

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. The customer need to decide whether to buy insurance for the car. Insurance coverage is either for the entire period of the rental, or none of the days i.e., there is no partial insurance coverage. 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 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 rate to remaining days and hourly rate to additional hours. 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 used cars to customers. A car is flagged to be "used" and eligible for sale, if its mileage exceeds

80,000 Kms. Once a car is flagged, it is removed from the rental pool. Sale of used cars does not apply to trucks. Each used car is given an initial asking price of 50% of the original purchase price. A club member can use every 2,000 club points in exchange of $100 towards the purchase of a used car. The database also keeps track of the date the car was added to the used car list, the date the car was sold, the final sale price, whether club points were used in the purchase, and the agent who sold the car.

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: The report contains 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 shows the number of vehicles rented from each category, the subtotal for each branch and the grand total for the day.
- Daily Rentals for Branch: This is the same as the Daily Rental report by it is for one specified branch
- Daily Returns: The report contains 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 shows the number of vehicles rented from each category and the amount of money paid by the customers, the subtotals of the number of vehicles and amount for each branch and the grand totals for the day.
- Inventory of used cars for sale: The report shows all the vehicles that were sold during the day, all the vehicles that were added to the used car list during the day, and all the vehicles that have been on the used car list for longer than 3 months.

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 services, like renting a vehicle, returning a vehicle, etc.
- **manager**: sells the used 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

1. 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).
2. Show the vehicles in a specified location and category that are overdue.
3. 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:

1. Show the vehicles in a specified location and category that are older than a specifies number of year. If the location or category is left out all qualifying vehicles are shown grouped by category and/or location.
2. Sell a vehicle to a customer or dealer.
3. 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 about some requirements you should discuss it with the instructor or the TA.