

Introduction to File and Database Management

CMPT 291

Spring Term 2024

Requirements Specification for the Database Programming Project

Introduction

In this project, you will design and implement a relational database system to support the operations of a car rental agency. You will use C# or VB.Net for the user interface. You can use an SQL or MySQL server for the database server. If you own a PC, you are encouraged to develop as much code as possible on your PC. You are to work in teams of four.

Getting Started

The system you are to develop should be able to be used by any car rental agency that has different branches in Canada.

- Each branch maintains a queue of all existing cars and car types.
- The car rental agency maintains a list of all their customers.
- Reservations can be done at any branch. Each customer can rent a car and return it to the same branch or any other branch in Canada for an additional fee.
- Car rental can be done daily, weekly or monthly. Each rental category has its pricing based on the car type.

Project Description:

The basic idea behind your car rental system is that it will allow agents to process rental reservations. Apply different SQL queries to check for available cars on specific dates. In this regard, it is a lot like an online car rental website. Visit these sites to understand what your system should look like. Your database system must be based on the specifications and requirements you will define and should be approved by the course instructor.

I will also place a tutorial on m  schan  s on how to connect to Access using C#.Net and develop the UI (User Interface) for your car rental course project.

System Users

There are two types of users. The first type is the customer, who can navigate to check available cars with their rental cost and locations. The second is the car rental employees who will process the rental and return transactions. They will also be able to execute any custom-built reports. It would be best if you assumed that the computer knowledge of the users is limited, and thus, your system must be easy to access and operate.

Required Data

The data items required for the car rental database can be classified into six categories: customers, cars, branches, car types, employees, and rental transactions. This classification does not imply any particular table arrangement. You are responsible for arranging the data items into tables, determining the relationships among tables and identifying the key attributes. Finally, you should specify and enforce integrity constraints on the data, including referential integrity constraints.

User Interface

The proposed system and its successors provide facilities for creating pop-up and pull-down menus, value lists, input/output forms, labels and customized reports. You should make use of all of these capabilities and, in the process, come up with a system that caters to users with only limited computer knowledge. The information you provide to customers should look professional and inviting.

Documentation

You must submit your completed database implementation with a design document containing information concerning your design criteria and decisions. The following is a list of some of the information you should include:

- Entity-relationship (E-R) Diagram of the complete database scheme
- Lucid description of the relational database scheme for your System, including a discussion of the reasoning behind your design decisions. Make clear how your design supports efficient query processing.
- Description of integrity constraints, including referential integrity

Grading

While working on this project, you will be given two assignments and different lab tasks (to be determined later):

- Produce an E-R and relational model of your system; Assignment 2. Group Work. 5% of your course, Mark. Deadline May 24th, 2024
- Generate all needed relational tables for your system; Assignment 3. Group Work. 3% of your course, Mark. Deadline May 28th, 2024
- Implement (VB.Net or C#) the final interactive system to support your system. To evaluate your final system, you will be asked to present your work in 2 milestones.

Milestone 1 (week of June 10th): Demo for Application screens (all needed User interfaces) and one screen connected to the database.

1. Car Screen connected to the database. In this screen, users should be able to add/modify/delete and search cars.
2. Rental transaction screen. In this screen, users should be able to rent/book a car on specific dates from a specific branch. Only available cars should be rented. (Milestone 1, only the user interface)

3. A screen that can execute five reports. These should be more complex reports. I am expecting to see nested queries and groups by usage. (Milestone 1, only the user interface)

Milestone 2: Demo for the final Project week of June 17th