

DataBases TUTORIAL # 3

Relational Schema

Exercise 1: Jewelry store

In a large jewelry store, the locations of the jewelry are called sections and are numbered sequentially (1, 2, 3,...). The jewelry has a reference and a weight and is stored in an individual or a collective section.

A saleswoman is responsible for a certain number of sections. A piece of jewelry is handled by the saleswoman responsible for a section (Each piece of jewelry is stored in a section and is under the responsibility of a saleswoman).

The saleswomen have a social security number, a name, a telephone number, and an address. They are classified into different staff categories.

Each saleswoman is part of a category. A category has a code and a label and can represent a group of saleswomen.

Each piece of jewelry belongs to a family of jewelry (sets, rings, necklaces, ...). Different families of jewelry can be stored in a section.

Occasionally, cleaning treatments are applied to jewelry. A piece of jewelry may have undergone several treatments in order to maintain its quality. A treatment is characterized by a designation and is carried out on a certain date.

Questions:

- Establish the relational schema that models this case study.

Exercise 2 :

Consider the following Library database schema:

Student (StdNum,StdName,SdtFirstName,StdAddress)

Book (BookNum, BookTitle, AuthorNum, PublisherNum, ThemeNum, YearEdition)

Author (AuthorNum, AuthorName, AuthorAddress)

Publisher (PublisherNum, PublisherName, PublisherAddress)

Theme (ThemeNum, ThemeTitle)

Loan (StdNum, BookNum,DateLoan,DateReturn)

A student can borrow several books at a time. Each time a book is returned, the return date is updated. Otherwise its value remains null. For statistical reasons, we keep all the tuples of the returned books in the Loan table. A book can not be borrowed on the same day when it has been returned.

Question:

- 1- Give the keys of these relations. Justify.
- 2- Give all the referential integrity constraints that appear in this schema.

Additional Exercise 3:

- Propose a relational schema for the context described in the exercise 1 of the Tutorial sheet # 2 (DBMS Models).

Additional Exercise 4: Travel Agency

A travel agency has computerized the management of the trips. It offers itineraries, visited monuments, reservations, etc.. The database was built from the following description:

A circuit is identified by a number, it is described by a departure city, an arrival city and a sequence of stages. A stage takes place over a given number of days, in a given city. During each stage, all the monuments of the City, where there are any, are visited. The departure and arrival cities are not considered as stages, their monuments are not visited.

The same circuit never passes through the same stage stopover several times, but it may happen that a departure (or arrival) of a circuit is also one of the stopover cities of this circuit. This makes it possible to take into account situations where the cities of departure and/or arrival are the subject of a visit.

Cities are identified by name.

The monuments are identified by their name and the city where are located. Each monument has a visit price. A circuit can be scheduled several times, on different dates. Each of these programs is associated with a number of places. Two programs of the same circuit can have different numbers of places. On the other hand, the price of a circuit is fixed, always the same whatever its programming. A circuit lasts a number of days equal to the sum of the durations of each of its stages.

A reservation, identified by a number, is made on behalf of a customer (identified by name) and concerns the programming of a circuit. The date on which the client booked is considered to be the departure date of the tour. Several places for the same programming of the same circuit can be reserved.

A reservation for a given circuit program is possible if and only if the number of seats to be reserved is less than or equal to the number of available seats for the program; if scheduling is possible, the number of places available is then reduced by the number of reserved places.

Questions:

- Propose a relational schema for this system.