October 17, 2019

Name :

Databases - Duration: 3 hours

Exercise 1:

In this exercise, we want to model and design the database. We need a diagram to represent informations about a vehicle rental company.
This company wants to set up an online website that helps them manage rentals and their fleet.

It offers several categories of vehicles for rent, for example: ‘truck’, 'car', 'minibus', 'without license'. Among these categories, there are several possible vehicle choices. The vehicles are identifiable within the company thanks to their license plate number. This plate number allows you to find information about the car, such as: the name / model of the car, the year of construction, the color and the car manufacturer.
Each car manufacturer is identified in the company by name, address and country of head office.

'Customers' are people who have already rented one or more vehicles. A customer can book a vehicle at any time and the company also wants to save the details of the order of it. She wants to know the date of purchase and which vehicle (s) the customer has rented. A customer can book several vehicles at the same time (in the same order) as long as these vehicles are available.
The company saves this customer data: the customer's name, address, phone number and email.
Customers also have a unique identifier with the company that we will call ‘client_ref’.

From this data, you need to model the DB and design a EA diagram.
You must:

- Determine the entities (tables) present.
- Identify all the attributes of each table.
- Identify the relationships between the different tables.
- Identify the cardinalities of these relationships.

Exercise 2:

The 'SPOTIFY' database contains the following tables:

- USERS (ref_user, username, address, mail, phone)
- PLAYLISTS (id_playlist, name, creation_date, #ref_user)
- ARTISTS (id_artist, name, gender, age)
- SONGS (id_song, name, release_date, #id_artist)
- PLAYLIST_CONTENT (#id_playlist, #id_song)

The primary keys are underlined and the foreign keys are preceded by an asterisk (#).

Knowing that:

- A user can search for music or artist
- A user can create one or more playlist (s) at any time.
- A playlist can consist of one or more songs.
- A piece is written by a single artist.
- A song can appear in several playlists

Write the SQL queries corresponding to the following questions:

(a) Retrieve artists under 50 years old.
(b) Collect gender ('gender') artists.
(c) Recover songs that begin with the letter 's'.
(d) Recover songs that end with the letter 's'.
(e) Recover songs that do not contain the letter 's'.
(f) Get the number of playlists, all users combined.
(g) Recover only the artists who appear on at least one playlist.
(h) For each song, count how many times it appears in a playlist.
(i) For each user, get his nickname and the number of playlists he has created.
(j) Recover users who do not have a playlist.
(k) Recover all users who have at least one music from 'Madonna' on one of their playlist.
(l) Count the number of users who have at least one 'Madonna' music on one of their playlist.
(m) Insert a new playlist with the name "rap playlist" for the user with the ID 5.
(n) Update the address of the user "jimmy_punchline" with "5 rue du manoir 14000 CAEN"
(o) Delete the user "orselan57" regardless of referential integrity (between keys).