Tecnologias de Base de Dados
Assignment #2 | Object Relational

Delivery Week: 13

ASSIGNMENT GOALS

Think about the possibilities open by the object-relational schema, with respect to the relational schema, namely the use of user defined types, with objects combining data structures and the functions to manipulate them, inheritance, nested tables and vectors, object references and comparison and sorting methods. Develop a small illustrative database.

TEAM

The work should be done by teams of two.

SUBJECT

Consider the following model fragment relative to the HR system for managing a multinational company's human resources. The company is organised into departments, each based in a local belonging to a country in a region of the world. A department has a manager who is an employee.

Each employee has the personal data and a hire date, is assigned to a department, has a direct manager and executes a job, with a given salary and commission percentage. A job is associated to a range (minimum and maximum) of possible wages. There is a historic record of jobs for the employees that already had more than one, with the start and end dates, the job and the department where it has been performed. The current job has been running since the day after the end of the last historical record or since the hire_date if there is no record in the history for that employee.

There are primary key restrictions on the first attribute of each table, except in the case of the job history, where the primary key is constituted by the employee's id and the start date.

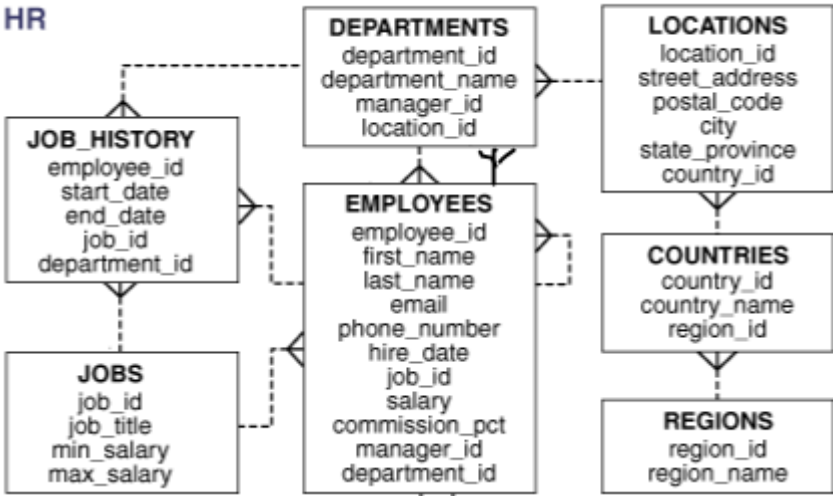

Figure 1: Relational schema for the HR system.

1) Design an object-relational data model for this situation, exploiting the SQL3 extensions. The model may be drawn schematically and then in actual DDL and implemented.

2) Populate the object-relational model with the data in the relational database.
3) Add some methods that may be useful for some common SQL queries.
4) Execute some queries on the OR DB.
    a) Calculate the total number of employees that each department has got.
    b) In each department, how many employees are there for each job title?
    c) Indicate the best paid employee in each department.
    d) Check whether the job history has time gaps for each employee. Sort the employees by job duration on the current day.
    e) Compare the average salary by country?
    f) Add a query that illustrates the use of OR extensions.