FACULDADE DE ENGENHARIA DA UNIVERSIDADE DO PORTO
Integrated Master in Informatics and Computing Engineering

Database Technology

Lab assignment nº 2

OBJECT RELATIONAL ASSIGNMENT

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 assignment must be executed by teams of one or two elements.

SUBJECT

Consider the following model fragment relative to the HR system about the management of human resources in a multinational company. The company is organized in departments, each one based in a local, belonging to a country in a region of the world. A department has a manager that 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 salaries. There is an 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 is running since the day after the end of the last historic 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.

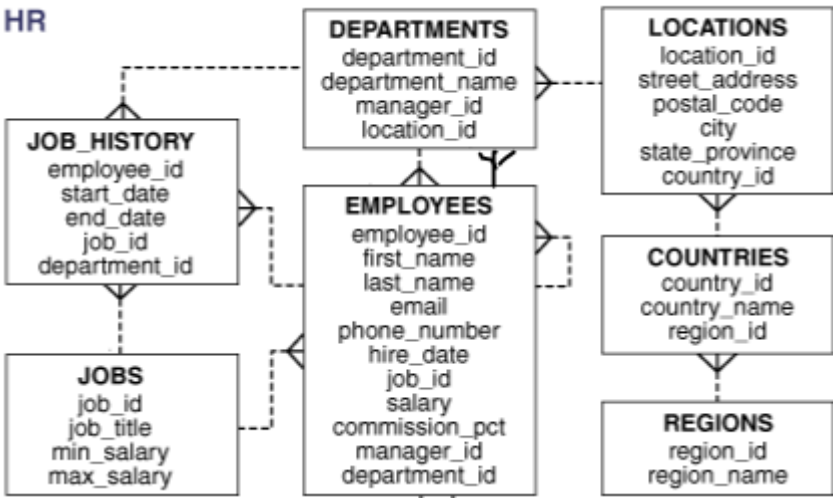

Figure 1: Relational schema for the HR system.

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.