INM370 – Advanced Databases

Tutorial 2 – Object-Relational Databases

Scenario

Consider the following requirements for the database system of an insurance company:

The insurance company deals with clients who are identified by a unique code, name, age, contact phone number and address. Each client needs to have a bank account. The details of the bank account are stored in the system and includes account number, bank name, branch code, and the address of the branch. A client can have different insurance policies in the company, but each insurance policy is related to one client. The insurance policy is identified by a unique number, and contains information about the starting date, ending date, description, monthly premium payment amount, and payment format (e.g. direct debit). An insurance policy has to be of type life, health, car, or house. Each *distinct* insurance type has its own associated policy value. In addition, a car insurance policy contains information about the car model, year, car type, and market value. A house insurance policy has information about the house location, market value, purchased value, type, and size. The insurance policies of type life, car, or health can have dependents associated to them. Information about these dependents is kept in the system and comprises dependent code, name, address, and age. Each dependent can be related to different insurance policies and each insurance policy can involve many dependents.

Questions:

a) Create an ER-diagram for the above database. Your diagram should specify entities, relationships, attributes, keys, mapping cardinalities, participation constraints, and existential dependencies.

b) Translate the ER-diagram developed in (a) into a set of relations following the guidelines discussed in the lecturers[1]. Make sure that you identify all primary and foreign keys**.**

c) Using the modelling constructs from the previous items (a) and (b), build the data model, specifying necessary types and tables, for the ORDB using
   (i) The notation of the SQL:2011 standard, and
   (ii) The notation implemented by Oracle

d) Write the queries below in (i) the notation of the original SQL:2011 standard, and (ii) the notation implemented by Oracle.
   1. List all clients and their respective bank name.
   2. List all clients' names, and the numbers of their respective insurance policies.
   3. List all life insurance policies numbers and the names of the dependents in these policies.
   4. List the names of all clients whose banks are located in London.

[1] For example, please see the relevant Lecture 1 slides and refer to the other sources if needed, e.g. the textbook chapters/sections: Chapter 4, Sect. 10.6, Sect.12.1-12.6 etc.