

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

The situation is about data on the municipal budgets over several years. The amount of expenses and revenues for each year is classified according to several headings, of type expense (“D”) or revenue (“R”). The headings are structured in parent-children hierarchies. The expenses and revenues are recorded for specific periods, quarters or years. In this assignment only the annual expenses (AExpenses) and revenues (ARevenues) are relevant.

Each municipality has a code and belongs to a NUT III, which belongs to a NUT II, which belongs to a NUT I, which belongs to a country. The GeoLevel states the aggregation level. The area and the population are also recorded for the various levels of geographic aggregation. Notice that the sum of the areas of the geographic entities that are part of a higher level entity do not always add exactly to the total area, due to rounding errors. The ruling party on the municipality on the each period is recorded in table Leaderships. The parties and coalitions have been broadly grouped in the attribute partyName, so aggregations by party should use the partyName and not the party acronym.

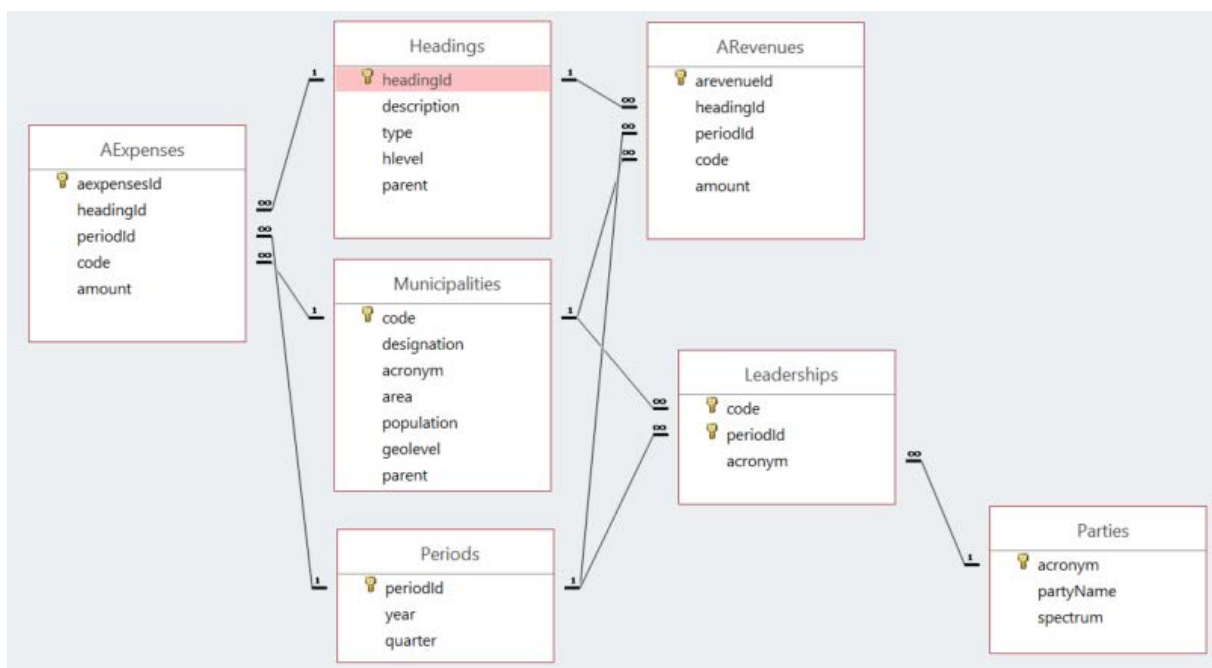


Figure 1 – Relational model for the case Municipal Budgets.

- 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 expenses by period and by heading of the municipalities of each region. Order municipalities by decreasing population.
 - b) Check whether the higher level headings values are consistent with the corresponding lower values.
 - c) Which the average expense by thousand inhabitants on each heading for each party?
 - d) Which is the party with more investment per square km on each year?
 - e) Which is the party with more salaries per thousand inhabitants on each year?
 - f) Add a query that illustrates the use of OR extensions.