Conceptual data modeling
ER schema

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Exercise 1
Italian administrative borders

Exercise 2
Archaeological Park
Italian administrative borders: conceptual schema definition

Requirements
The relations between the different Italian administrative entities (regions, provinces, towns) have to be modelled.

- Each region is characterized by: name and regional capital.
- Each province is characterized by: name, abbreviation, chief town, the region it belongs to, neighbouring provinces and foreign countries (identified by name, capital and number of inhabitants).
- Each town is characterized by: name, province and region it belongs to, altitude, geographic position, number of city dwellers.

Each town belongs to a unique region and a unique province, each province belongs to a unique region. Each region has one capital; on the contrary each province may have more than one chief town (e.g. Massa and Carrara, Pesaro and Urbino,...).
Note: in a spatial database the relations between geographic features are implicitly defined.
Archaeological Park: conceptual schema definition

Requirements

The authority of an archaeological park want to realize a database to better manage its data. The historical evidences in the park are stone engravings: these are mainly present in a valley and on a plateau dominating it.

Each engraving group (named site) has an identifier; moreover the stone lithological composition, the elevation, the path to reach it, the geographic coordinates (latitude and longitude), the owner of the estate the site belongs to.

The engravings are from different times and therefore they show different characteristics: they are classified according to their age. For each historical period the total number of engravings and their location must be stored.

Moreover the references to records (papers, books,...) related to the sites must be archived. Records are defined by:

- a code (identifier)
- the author(s)
- the publisher(s)
- the title
- the publication year.

Each site can be associated with many records and the records themselves can be describe many sites.

The sites are in private estates. For each of them it is necessary to store the cadastral identifier and the owner name, surname, address, telephone number and taxpayer code number.

Each site has one or many managers (each of them can be responsible for one or many sites). Each responsible person is characterized by: name, surname, address, telephone number and taxpayer code number. Moreover a field for generic notes has to be taken into account in the database for each manager.

The park authority suggests different tour pathways:

- Full tour (it reaches all the park sites, it lasts for six hours);
- Short tour (it winds the whole park, but the visit is limited to the much meaningful sites, it lasts for three hours);
- Family tour 1 (easy tour in the park valley, it lasts for two hours);
- Family tour 2 (easy tour on the plateau dominating the valley, it lasts for an hour and a half).

Inside the park, beside the pathways, some service points have been arranged (refreshment bars, toilets, rest areas, souvenir shops). In the database we want to store their typology and the paths they are reached.