

## Databases: Database design

### Exercise no.3

Design a database for the management of some activities for a cooking school.

- Cooking teachers work for the school. For each teacher the SSN, name, surname, name of the school where he/she graduated, e-mail address and phone numbers must be recorded.
  - Kitchen tools are identified by a code and characterized by the material type and a brief description. Kitchen tools are classified in pots, knives, robot, and kitchen units. Cooking type and size are known for pots, while blade length and breadth are known for knives.
  - Several cooking courses are given at the school. A cooking course is uniquely identified by a code and the level (e.g., beginner, intermediate, advanced). Many editions of the same cooking course can be given. For each edition, the starting date, end date, cost, and kitchen in which the course is given have to be stored. The same course can be given more times in the same year and in several, possibly different, kitchens. For each kitchen, the room number, floor, and number of cooking desks must be recorded.
  - Cooking courses consists of lessons. Every lesson is identified by a code, that is unique among the lessons of that course, and is characterized by its starting time and its duration. For each lesson, the teacher and the list of exploited kitchen tools are also known. The same kitchen tool can be exploited in different lessons, and many kitchens tools can be exploited in a given lesson.
  - People enrolled at the school are identified by their SSN. For each person, the name, surname, date of birth, address, telephone number and e-mail address (if available) are known. For each person, the list of cooking course lessons he/she attends is also known. A person can attend different cooking course lessons, and a cooking course lesson can be attended by many people.
  - Several recipes can be presented during a cooking course lesson. Each recipe is characterized by a unique code, the level, a description, and preparation and cooking times. For each recipe, the list of required ingredients and the corresponding quantity must be stored. Recipes can be classified in dough and pastry, hors d'oeuvre, fish and meat, vegetables, and dessert. For dessert recipes, the type (e.g., cookies, cake) and the pastry used to make it are also known.
1. Describe the conceptual schema of a database for the above application by means of an ER diagram.
  2. Derive a normalized relational logical schema for the same database.
  3. Define referential integrity constraints for 3 relations of your choice among those defined in the conceptual schema.