Homework 1: Relational database design

Artworks and the exhibitions in a museum

A renowned museum wants to design a database for managing the art works and the exhibitions located in its spaces.

- The museum consists of different buildings. Each building is identified by a code and is characterized by its name, address, and size (i.e., its volume in m^3). The address is composed by street, number and city. Each building has many rooms. Each room is identified by a code, unique within the building where the room is located, and is characterized by the number of seats and by the maximum number of standing people allowed.
- The museum employees are divided into operational workers and restorers. Each employee is characterized by the Social Security Number (SSN), name, family name, and number of years of experience in the museum. For each operational worker, their role is known, whereas for the restorers, the information on where they come from (i.e., city and country) and a list of specializations is given.
- The museum organizes various exhibitions. Each exhibition is identified by an alphanumeric code and it is characterized by a title, a description, and the list of rooms where the exhibition is held. For each exhibition, the opening and closing dates are known, as well as the weekly opening hours of each exhibition (e.g., Monday from 9 a.m. to 12 noon and 3 p.m. to 6 p.m., Tuesday from 9 a.m. to 12 noon and 5 p.m. to 6 p.m., etc.). For each exhibition the list of exhibited artworks is known as well as the operational worker who is in charge of supervising the exhibition. Artworks available in the museum are identified by a unique code and are characterized by their title and author.
- The museum wants to keep track of the artwork restorations. Each restoration is identified by the target artwork, the reference restorer and the start date of the activity. Each restoration is then characterized by the end time of the activity (if available) and the cost. Notice that each restorer could be involved in multiple restorations. Moreover, the same artwork can have multiple restorations in different time periods, by the same restore or by different restorers.

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.