

## Exercise on database design: STEP Programme

The Students of Technology Exchange Programme (STEP) wishes to design a database to manage its activities.

- The universities participating in the STEP programme are characterized by a unique alphanumeric code, the name, the address, the city, and the country.
  - A number of services (e.g., Wi-Fi access, tourist information office) are available free of charge at each university for the students enrolled in the STEP programme. Each service is uniquely identified by a numeric code within the university where it is provided, and it is characterized by its name and a short description. For each service, the database stores opening and closing times on each day of the week (e.g., Monday 9:00am–6:00pm). Please consider that, on a given day, each service is open in at most one time slot.
  - Different committees (e.g., housing committee, sporting committee) are appointed within the STEP programme to perform various tasks. Each committee is identified by its name, and it is characterized by its web page address (if any) and the list of tasks for which it is responsible (e.g., finding accommodation, selecting sponsors, organizing sporting events).
  - The events organized within the STEP programme are identified by their name and the date on which they are held. For each event, the time, the place, and the maximum number of participants (if any) are known. In addition, the committees that organize the event are stored.
  - The students enrolled in the STEP programme are identified by their social security number (SSN), and characterized by their name, age, list of email address, and the university in which they are enrolled. Students are divided into organizers and guests. Organizers are characterized by their main field of expertise (e.g., sports or accounting) and the committee of which they are members, together with the date on which they have joined the committee. Guests are characterized by a description of their specific dietary requirements (if any).
- (a) Describe the conceptual schema of a database for the above application by means of an ER diagram.
- (b) Derive a normalized relational logical schema for the same database.