Databases: Database design

Exercise no.1

Design a database for the management of MotoGP competitions.

- A competition is identified by the date in which it is performed. For each competition the name of the circuit and the number of circuit laps are known. Each circuit is characterized by the name, the length and the city name. A competition is performed in a single circuit, while many competitions can be performed in the same circuit.
- Each person is identified by a registration number and characterized by name, surname, date of birth, and possibly a phone number. People can be classified in riders, mechanics and designers. For designers the list of specializations (if any) is known, while for mechanics the name of the last motorcycle maker for which they worked is known. For each rider the database stores all the competitions in which he ran and the result of the competition. A rider may run in many competitions and in each competition may run many riders.
- A team is identified by the name and is characterized by the date of the team establishment and the headquarter city. Each person which works in a team stipulates with it an agreement (i.e., a contract). Each contract is identified by a unique number with respect to the team it has been agreed with. The start date, the end date, and a brief description are also known for each contract.
- Each advertising brand (mark) is identified by the brand name and it is characterized by the logo and the type of product. The database stores every period of time (start date - end date) in which an advertising brand sponsors a team. An advertising brand may sponsor many teams at the same time. The same team can be sponsored by the same advertising brand several times.

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.