

Database design and programming

The soccer World Cup 2014 is a database that has¹ data about the national teams that competed, their players, games and more.

Each team has a name (the name of its country, which is unique) and a set of players. Each player belongs to only one team and the database needs to know his age, first name and last name. A game happens on a date and has two competing teams. The database also keeps track of the goals scored in each game. In particular, for every goal the database needs to know the player who scored it and the minute in which it was scored.

Do not model aggregate measures, which can be derived from other data, into the E/R or the schema. For example, the score of a game can be derived by aggregating the goals of each team in that game. Therefore, the score should not be stored.

1. Create an E/R design for the above. Take a look at the queries before you decide on a design. Some E/R designs and schemas will make querying easier than others.
2. Create a relational schema, by providing the CREATE TABLE commands. Include UNIQUE constraints whenever applicable. Ignore CHECK and NOT NULL constraints.
Hint: Do not use country names or player names as primary keys and foreign keys of the respective tables.
3. Write a query that displays all the games of USA, along with the date of the game and the opponent. Neglect the score of the game.
4. Write a query that computes the total number of goals scored by each player of USA and displays the first and last name of the player and the total number of goals he scored. Do not assume that the score is explicitly stored in the database.

¹ To be precise, “will have data” since the Cup starts in 6 weeks.