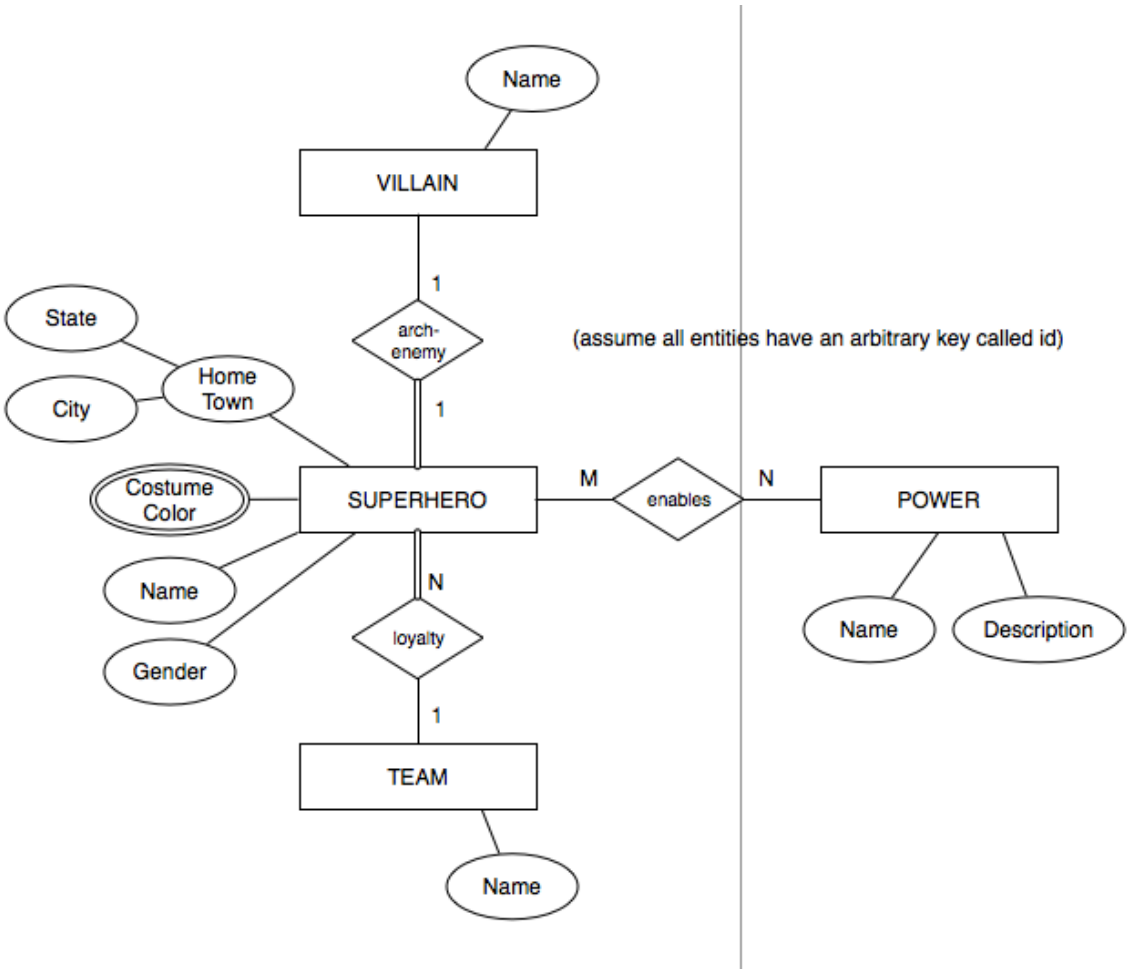
Homework 6

Database Design

This exercise enables you to practice designing a relational database schema given an ERD. You will need to think about cardinality, degree of participation, foreign keys, indexes, constraints and normalization.

Example ERD

Given the ERD below, follow the "ERD-to-Relational" design steps and draw a relational schema. Do not write DDL statements, simply draw the tables as we imagine them, with their attributes.



Questions

Given the picture of the relational schema that you have, answer the following questions.

1. Is your schema in 0NF? Explain.
2. Is your schema in 1NF? Explain.
3. Is your schema in 2NF? Explain.
4. Is your schema in 3NF? Explain.
5. What constraints must be used regarding villains?
6. What constraint must be used to ensure that no single superhero is associate with a particular color? In other words, what constraint must exist to prevent Bunny Man from being associated with Blue, Blue and Blue three times?
7. What are the foreign keys in this database schema? Name the table and column.
8. What general constraints should be used on the foreign keys?
9. What foreign key *constraints* should exist in this database schema?
10. What indexes should exist when we know that the schema will be used for the following queries?
    A. Finding a villain by name.
    B. Finding all the female (or male) superheroes.
    C. Finding all the superheroes in a particular state.
    D. Finding all of the superheroes on a particular team, given the team name.
    E. Listing all of the superhero names that have a power, given the power name.
    F. Listing all of the power names a superhero has, given the superhero name.