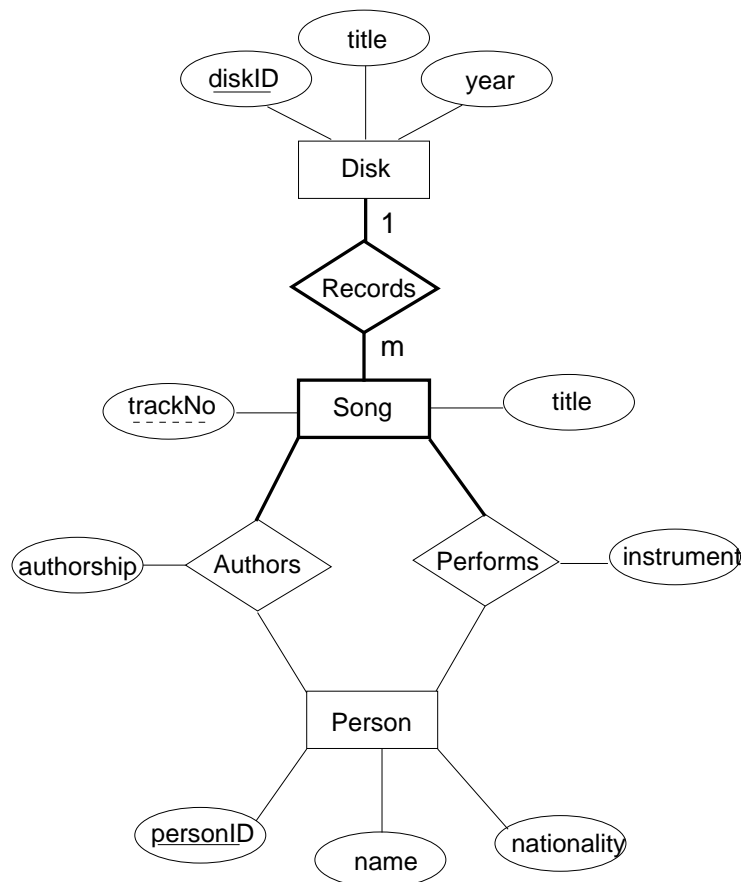


## 1. Conceptual Modeling (Sample Solutions)

### 2. Music Database

Below is an ER diagram that captures the data requirements for the music database as formulated in the exercise sheet. (Note that the requirements make a number of restrictive assumptions and are not necessarily realistic.)



**Notation:** We have replaced double lines with bold lines. For instance, double lines indicate mandatory participation, double lined boxes indicate weak entities, and double lined boxes indicate supporting relationships.

**Explanation:** A song is modeled as a weak entity that is owned by the disk on which it is recorded because it exists only because of that disk.

Both songs and discs have total participation in the relationship “Records” because on every disc some song is recorded and every song is recorded on some disk.

Also, songs have total participation in both, “Authors” and “Performs” because we assume that every song has an author is performed by somebody. These two assumptions, however, are debatable:

- a song may be a popular tune, the author of which is unknown;
- a song may have been recorded under circumstances where it was impossible to identify the performing artist.

Whether these constraints are reasonable or not can only be determined if more information about the intended application is available.

Person has no complete participation in “Authors” or “Performs”:

- some person may be an author without performing a song;
- another person may perform a song without having authored any.