

## Database design exercises

Conceptual design:

1. Design an ER diagram to model a system that facilitates a chatroom system.

Some of the pieces of data that will be needed: Spaces, which have one admin/creator as well as a set of moderators, and which consist of a set of channels presented in a particular order; channels, which have a name and consist of a list of messages; users who belong to spaces and post messages in channels, and have various settings such as display name and channels they have joined or muted; messages, which have a creator, a date/time, and a body text.

Some channels such as the “mod announcements” channel allow people to view but only allow moderators to post. Some channels such as the “moderator discussion” channel are only viewable by people with certain roles.

Logical design:

1. For the following table, identify the functional dependencies:  
LibraryRental (transactionID, renterID, renterName, rentalDate, dueDate, loanItemID, loanItemMedia, homeLibrary)
2. Come up with an example of a UNF schema and an update anomaly that can occur in that schema, which cannot occur in 1NF.
3. Come up with an example of a 1NF schema and an update anomaly that can occur in that schema, which cannot occur in 2NF.
4. Come up with an example of a 2NF schema and an update anomaly that can occur in that schema, which cannot occur in 3NF.
5. Come up with an example of a 3NF schema and an update anomaly that can occur in that schema, which cannot occur in BCNF.