

This file contains exercise assignments for us to solve in the second exercise session.  
Prepare by reading this document and at least think of how to solve the tasks.

## Exercise 2A: Yet Another Social Media App

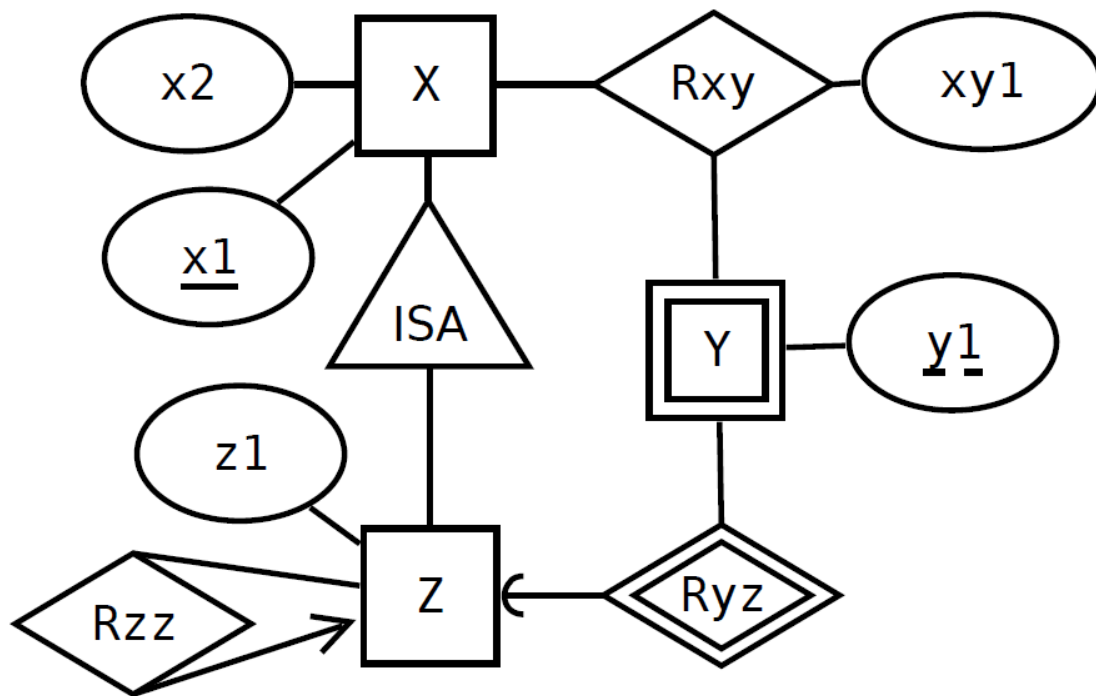
Make an ER-diagram for a web application where users can register, join interest groups, and post messages to these groups.

Users have unique usernames, and groups have unique names. Users can be members of any number of groups. The time each user joined a group should be recorded. Each group has an owner, which is a user. Each post is posted in a group by a user.

Posts contain text. Posts are identified by their timestamp and the username of the user posting it. There is also a special kind of post called a group link, these contain a link to a group in addition to the normal parts of a post.

## Exercise 2B: A somewhat tricky ER-diagram translation

Translate this (symbolic) ER-diagram into a relational Schema.



## Exercise 2C: Cooking with databases

a) Draw an ER-diagram for this domain:

You are making a database for recipes and ingredients. Every recipe consists of components, like “filling” or “glaze”. Each component has its own set of ingredients, and an amount for each such ingredient.

The next page contains an example recipe that could be built by extracting data from this database.

Additional features:

- Each recipe has its own unique name. Each component has a name that is unique for the recipe it's in.
- Each recipe has an instruction text.
- The database should store the unit of measurement of each ingredient (e.g. butter is always measured in gram so if a component contains 100 of ingredient “butter”, that means 100 grams).
- Some recipes require using an oven, for these recipes it should store temperature and time.
- Ingredients can have any number of alternate ingredients (globally for all recipes that use that ingredient). There is a conversion factor for each such alternate, e.g. 1 gram of sugar can be replaced by  $\frac{3}{4}$  gram of honey (so the factor is 0.75).

b) Translate your diagram into a schema.

An example recipe for Cinnamon buns with three components (“Main ingredients”, “Filling” and “Glaze”):

Uses an oven at 220 degrees Celsius for 6 minutes.

Main ingredients:

35 g yeast  
100 g sugar  
3 dl milk  
1 x egg  
120 g butter  
1 tsp salt  
1 tsp ground cardamom  
750 g flour

Filling:

100 g butter  
50 g sugar  
2 tsp cinnamon

Glaze:

1 x egg  
0.1 dl water  
100 g pearl sugar

Instructions: Crumble the yeast in a bowl and stir in a few tablespoons of milk ...