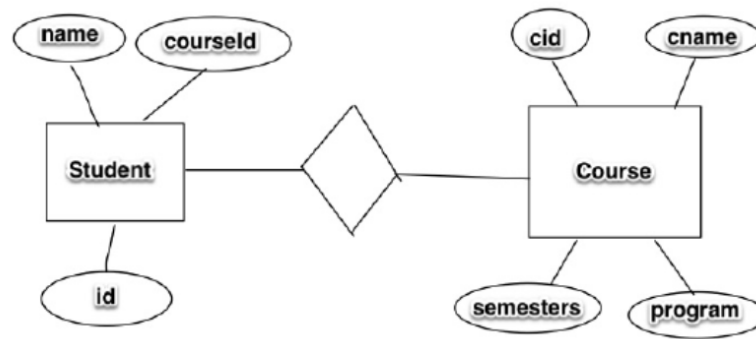


# Introduction to Database Design, Fall 2013

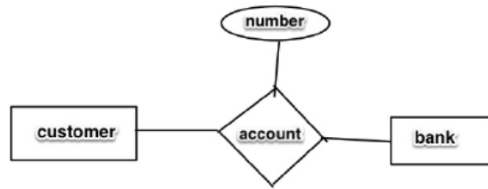
1. september 2013

## Exercises on E-R modeling

1. **Typical E-R modeling mistakes, part 1.** Identify three different problems in the following E-R model for a simple course database. All problems that you are supposed to find lead to mistakes in the corresponding relational model when following the method for translating an E-R model into relation schemas, key constraints, and foreign key constraints.



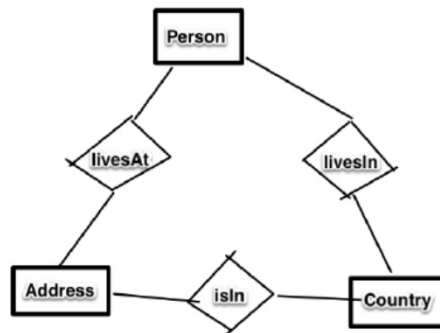
2. **Typical E-R modeling mistakes, part 2.** Identify a problem in the following E-R model for a database of banks and their customers (attributes omitted for simplicity). Again, the problem should be one that results in a bad data model (in particular, one that is too restrictive in the data it allows).



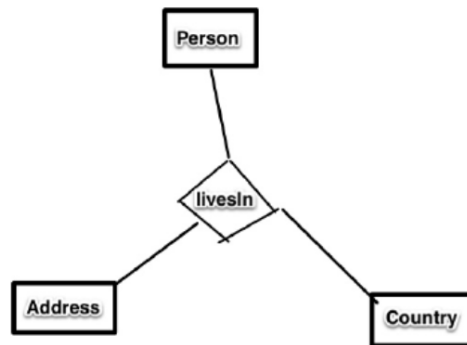
3. BDLF exam, January 2009, problem 1 (page 27 of exam collection).
4. Consider to what extent SQL DDL can be used to make a DBMS maintain the following types of constraints from an E-R model (when translated to relations): General cardinality constraints  $a..b$ ? Participation constraints? Disjoint Isa?
 

The answer can depend on how the translation is performed. If you happen to know about triggers, you should *not* use them here. If you don't know about triggers you should also not try to use them. As a side remark, this holds also for firearms.
5. **Typical E-R modeling mistakes, part 3.** Identify problems in the following E-R models for people and their addresses (attributes omitted for simplicity). This time, the problems have to do with redundancy, i.e., that the data model will record the same facts several times.

a)



b)



Suggest a better E-R model without redundancy.

6. IDB exam, January 2004, problem 1 (page 65 of exam collection).