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Database Technology

Exercise 4: ER Model

4.1. ER diagram tool

One possible tool is UMLet. You can download it from http://www.umlet.com/changes.htm .
Best use the most recent stand-alone version. If you want, you can copy the file "DatabaseTechnology.uxf" from Ilias to the directory "palettes" which is contained in the downloaded ZIP file. With that file you will have most of the entities we will need.

Try to get familiar with the tool by visualizing the diagrams of lecture slide 29, 32 and 53.

4.2. Insurance database

Construct an ER diagram for a car insurance company whose customers own one or more cars each. Each car has associated with it zero to any number of recorded accidents. Each insurance policy covers one or more cars, and has one or more premium payments associated with it. Each payment is for a particular period of time, and has an associated due date, and the date when the payment was received.

4.3. Sports team

Design an ER diagram for keeping track of the exploits of your favorite sports team. You should store the matches played, the scores in each match, the players in each match, and individual player statistics for each match. Summary statistics should be modeled as derived attributes.

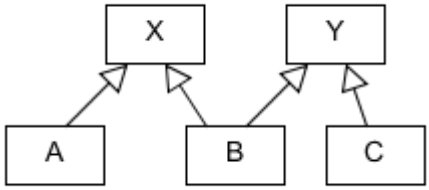
4.4. Student marks

Consider a database used to record the marks that students get in different exams of different course offerings (sections).

a. Construct an ER diagram that models exams as entities, and uses a ternary relationship, for the database.
b. Construct an alternative ER diagram that uses only a binary relationship between student and section. Make sure that only one relationship exists between a particular student and section pair, yet you can represent the marks that a student gets in different exams.

4.5. ABC

Following ER diagram shows a lattice structure of generalization and specialization (attributes not shown). For entity sets A, B and C, explain how attributes are inherited from the higher-level entity sets X and Y. Discuss how to handle a case where an attribute of X has the same name as some attribute of Y.



4.6. Relation schemas

Construct appropriate relation schemas for exercise 4.2 and 4.3.