Translating Entity-Relationship to Relational Tables

M. Tamer Özsu

David R. Cheriton School of Computer Science University of Waterloo

CS 348 Introduction to Database Management Fall 2012

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E-R Diagram to Relational Schema

Main ideas:

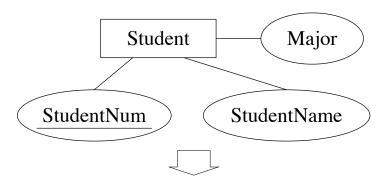
- Each entity set maps to a new table
- Each attribute maps to a new table column
- Each relationship set maps to either new table columns or to a new table

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Representing Strong Entity Sets

Entity set E with attributes a_1, \ldots, a_n translates to table E with attributes a_1, \ldots, a_n

Entity of type $E \leftrightarrow \text{row}$ in table EPrimary key of entity set \to primary key of table Example:



Student

dentName Major	StudentNum
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Representing Weak Entity Sets

Weak entity set E translates to table E

Columns of table E should include

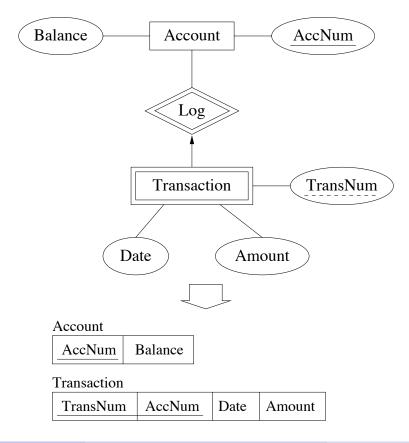
- Attributes of the weak entity set
- Attributes of the identifying relationship set
- Primary key attributes of entity set for dominating entities

Primary key of weak entity set → primary key of table

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Representing Weak Entity Sets (cont.)

Example:



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Representing Relationship Sets

- If the relationship set is an identifying relationship set for a weak entity set then no action needed
- If we can deduce the general cardinality constraint (1,1) for a component entity set E then add following columns to table E
 - Attributes of the relationship set
 - Primary key attributes of remaining component entity sets
- Otherwise: relationship set R o table R

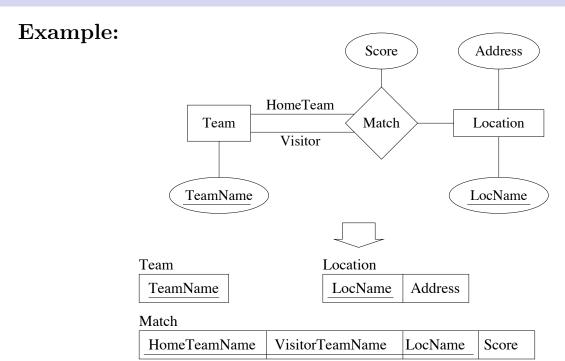
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Representing Relationship Sets (cont.)

- Columns of table R should include
 - Attributes of the relationship set
 - Primary key attributes of each component entity set
- Primary key of table R determined as follows
 - If we can deduce the general cardinality constraint (0,1) for a component entity set E, then take the primary key attributes for E
 - Otherwise, choose primary key attributes of each component entity

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Representing Relationship Sets (cont.)



Note that the role name of a component entity set should be prepended to its primary key attributes, if supplied.

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Representing Aggregation

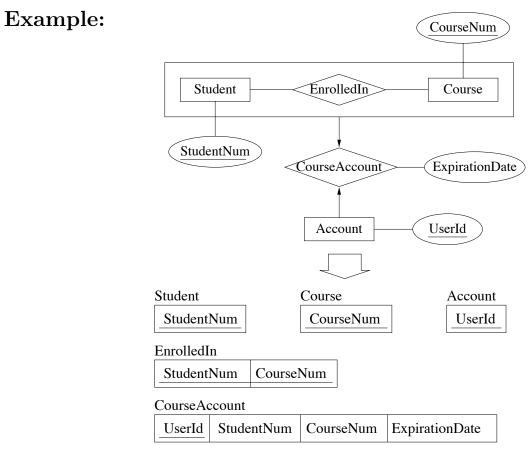
Tabular representation of aggregation of R

= tabular representation for relationship set R

To represent relationship set involving aggregation of R, treat the aggregation like an entity set whose primary key is the **primary key** of the table for R

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Representing Aggregation (cont.)

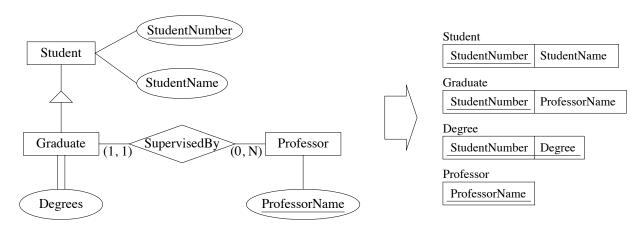


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Representing Specialization

Create table for higher-level entity set, and treat specialized entity subsets like weak entity sets (without discriminators)

Example:



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Representing Generalization (Approach #1)

Create a table for each lower-level entity set only

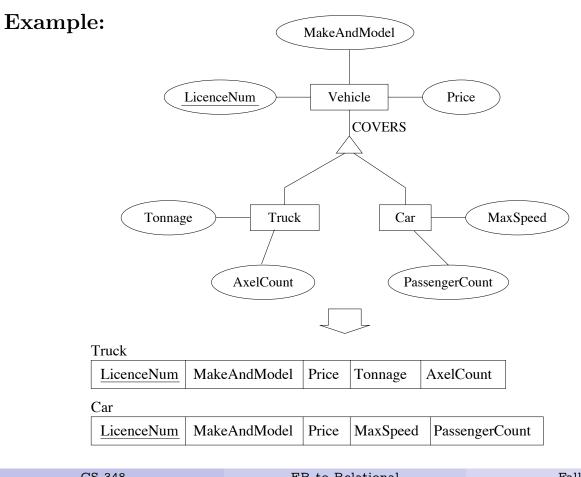
Columns of new tables should include

- Attributes of lower level entity set
- Attributes of the superset

The higher-level entity set can be defined as a view on the tables for the lower-level entity sets

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Representing Generalization (Approach #1)

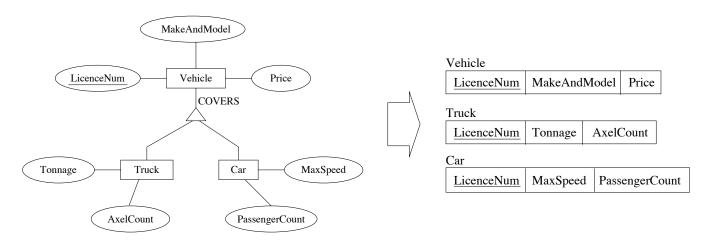


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Representing Generalization (Approach #2)

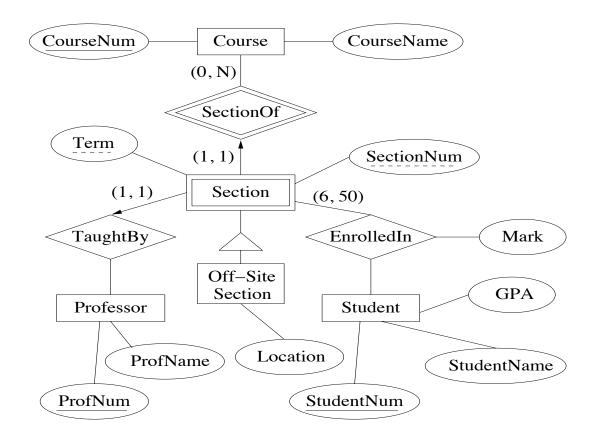
Treat generalization the same as specialization.

Example:



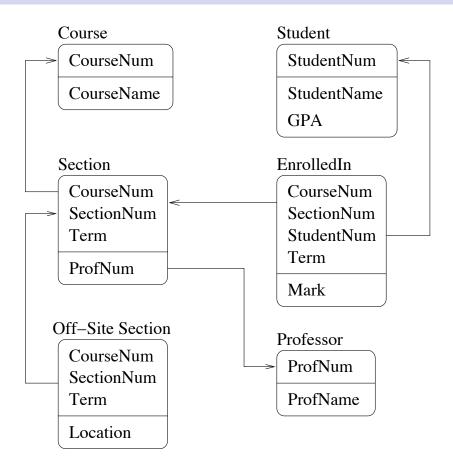
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Example Translation: ER Diagram



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Example Translation: Relational Diagram



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