CSc 134 Database Management Systems

4. Relational Database Design by ER-to-Relational Mapping

Ying Jin

Computer Science Department

California state University, Sacramento

ER to Relational Mapping

- ER is a conceptual model
- Map conceptual model to representational /implementation model

(Strong) Entity

◆ Create a relation for the entity

◆ Include all the simple attribute and simple composite attributes of a composite attribute

Weak Entity

- The primary key of an weak entity is the combination of the primary key of the owner(s) and the partial key of the weak entity.

1:1 Relationship

- Chose one entity to include the primary key of the other entity as *foreign key*.

- Include simple attributes of the relationship

- It is better to choose an entity type with total participation.

1:N Relationship

- The entity at N side includes the primary key of the entity at 1 side as foreign key.
- The entity at N side includes simple attributes of the relation

1:N Recursive Relationship

◆ The entity includes the primary key of itself as foreign key to represent the recursion

M:N Relationship

- Create a new relation for the relationship
- Include the primary keys of the two entities as foreign keys.
- The combination of two foreign keys as the primary key of the new relation.

Multivalued Attributes

- ◆ Create a new relation R for a multivalued attribute A (of entity E).
- ◆ R includes an attribute corresponding to A and the primary key of E as the foreign key.
- ◆ The combination of A and this foreign key as the primary key of R.

These slides based on the textbook:

R. Elmaseri and S. Navathe, *Fundamentals of Database Systems*, 7th Edition, Addison-Wesley.