ER Model: More on Relationships

Conceptual Data Modeling

UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

Kevin C.C. Chang, Professor

Computer Science @ Illinois

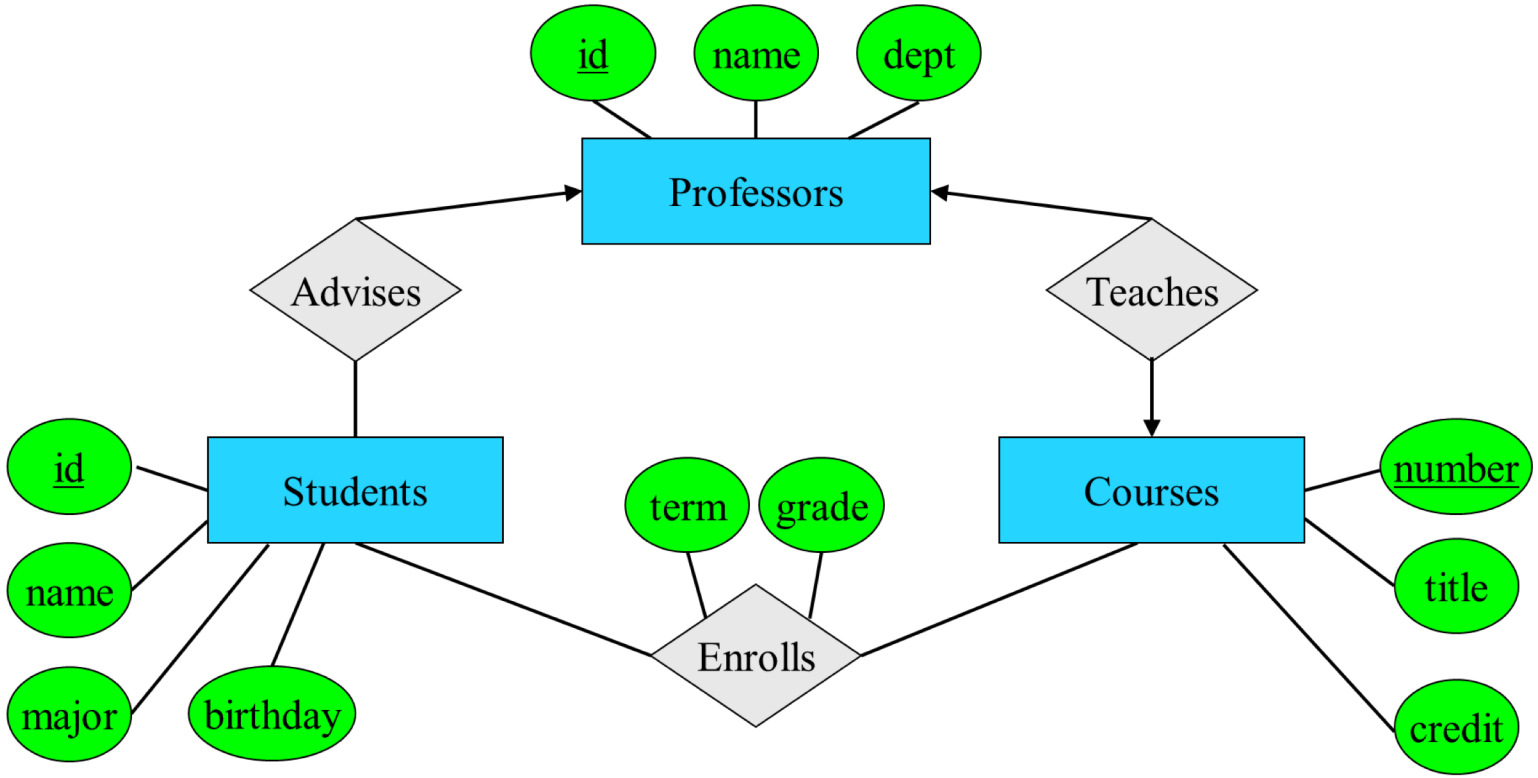
Learning Objectives

By the end of this video, you will be able to:

- Specify the multiplicity of a relationship.
- Identify the roles of the entity sets in a relationship.

Multiplicity of Binary Relationships

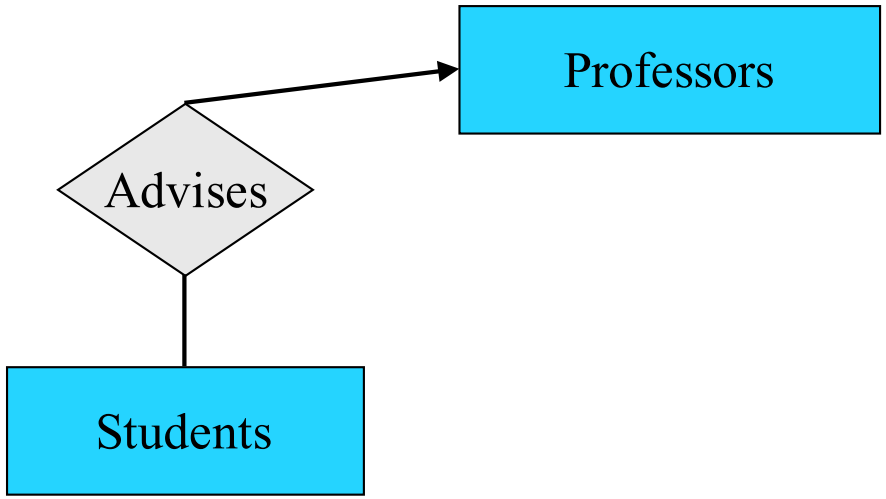
- Many-one
- One-one
- Many-many



ER diagram for example application Academic World

Many-One Relationships

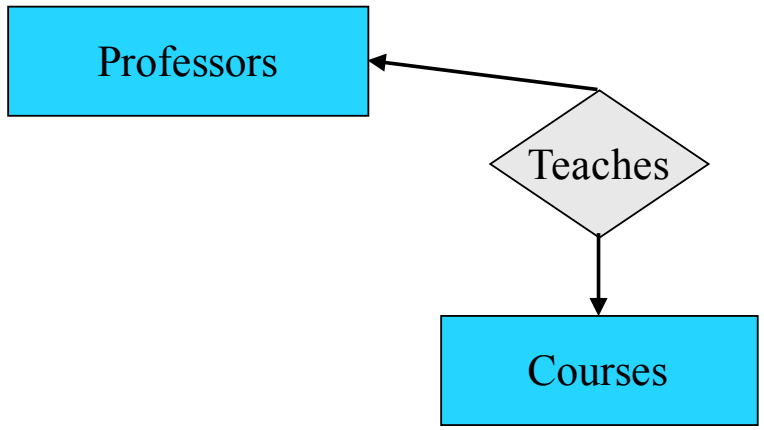
- The ONE side:
  - **Zero-or-one** entity at the “one” side can be related from an entity at the other side.
- The MANY side:
  - **Zero-or-more** entities at the “many” side can be related from an entity at the other side.



An example many-one relationship

One-One Relationships

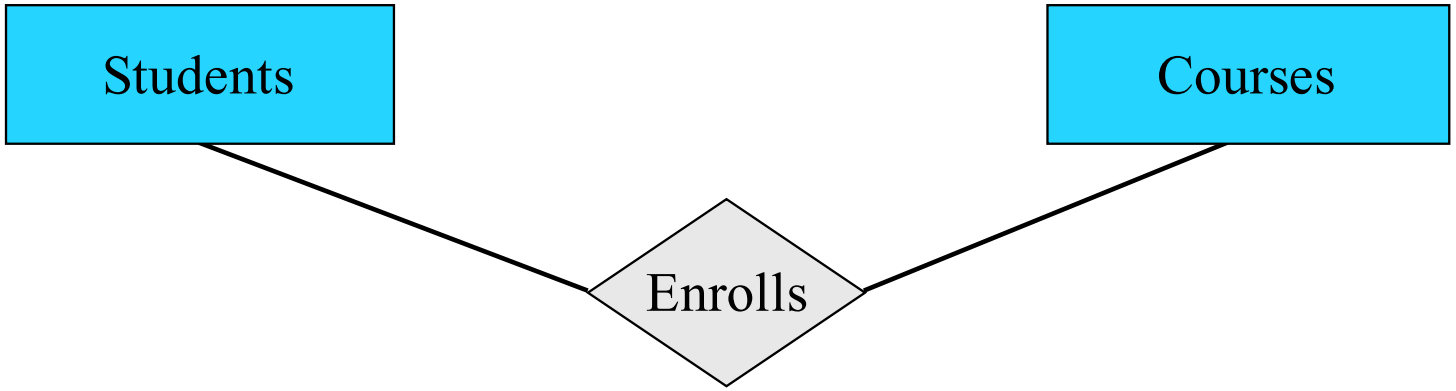
- Each entity at either side relates to **zero-or-one** entity of the other side.



An example one-one relationship

Many-Many Relationships

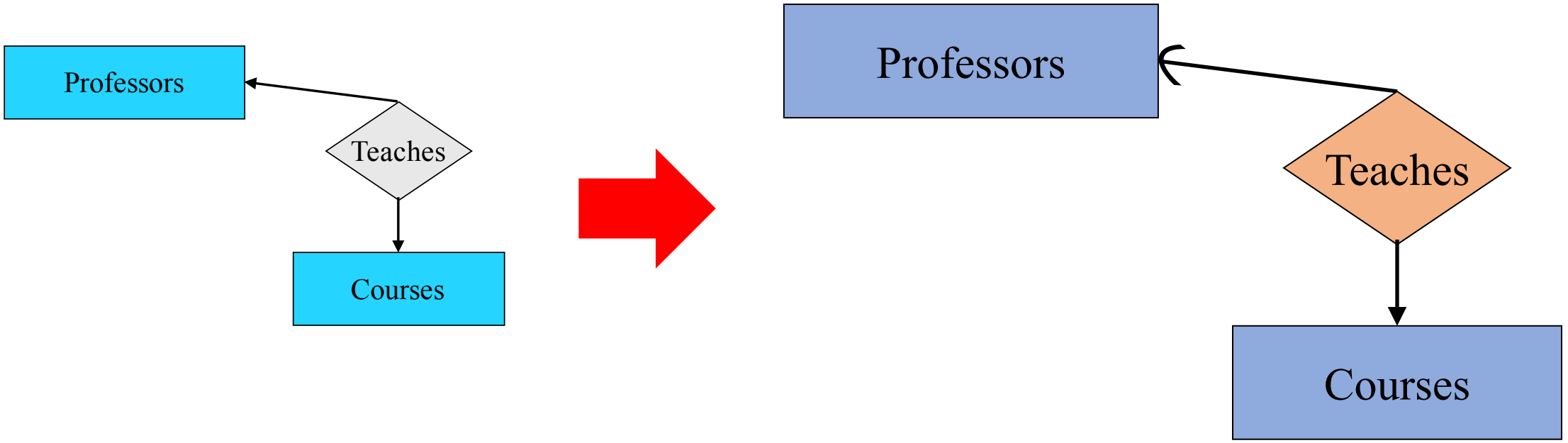
- Each entity at either side relates to **zero-or-more** entities at the other side.



An example many-many relationship

“Exactly-One” in a Relationship

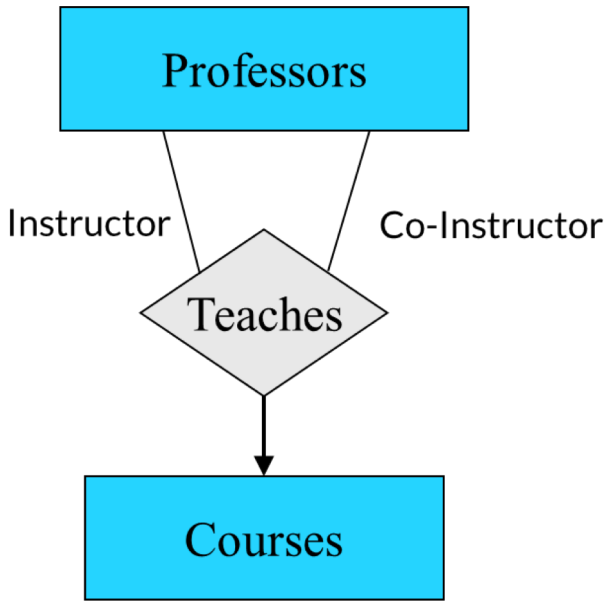
- Use a round arrow.

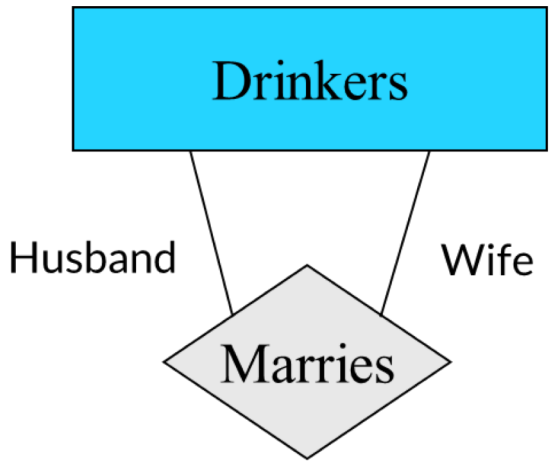


Using exactly-one in a relationship

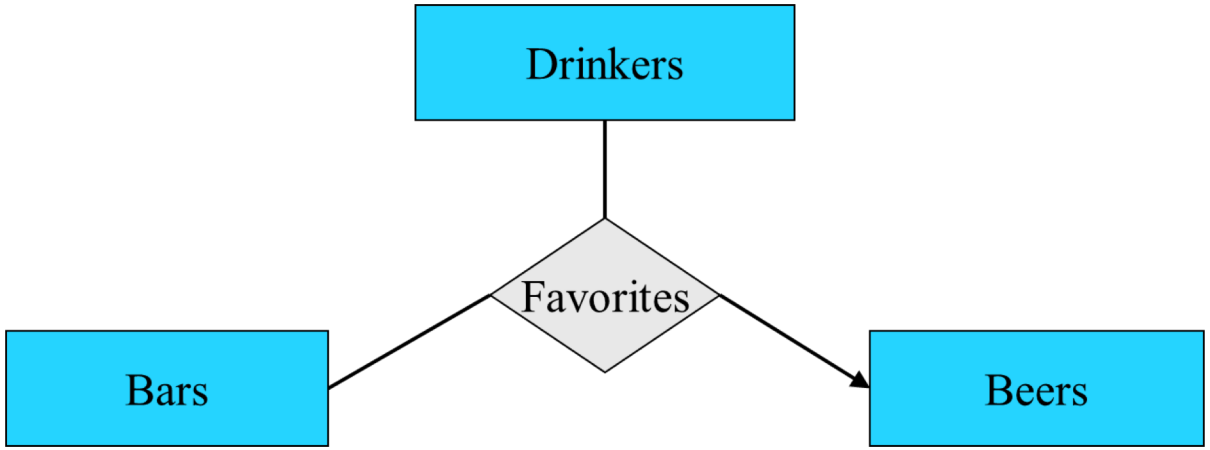
Roles in Relationships

- When an entity set is involved multiple times in a relationship.
- Label each involvement with a **role**.





Labeling roles in relationships

Food for Thought

Does "multiplicity" apply to multiway relationships?
How do you define such multiplicity, e.g., many-many-one?