Session 3-2 Transforming ERD to Relational Model 1

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Transforming EER Diagrams into Relations

- Entities
  - Regular entities
  - Weak entities
- Relationships
  - One-to-many
  - Many-to-many (Associative entity)
  - One-to-one
  - Unary
  - Binary
  - Ternary
- Supertype / subtype

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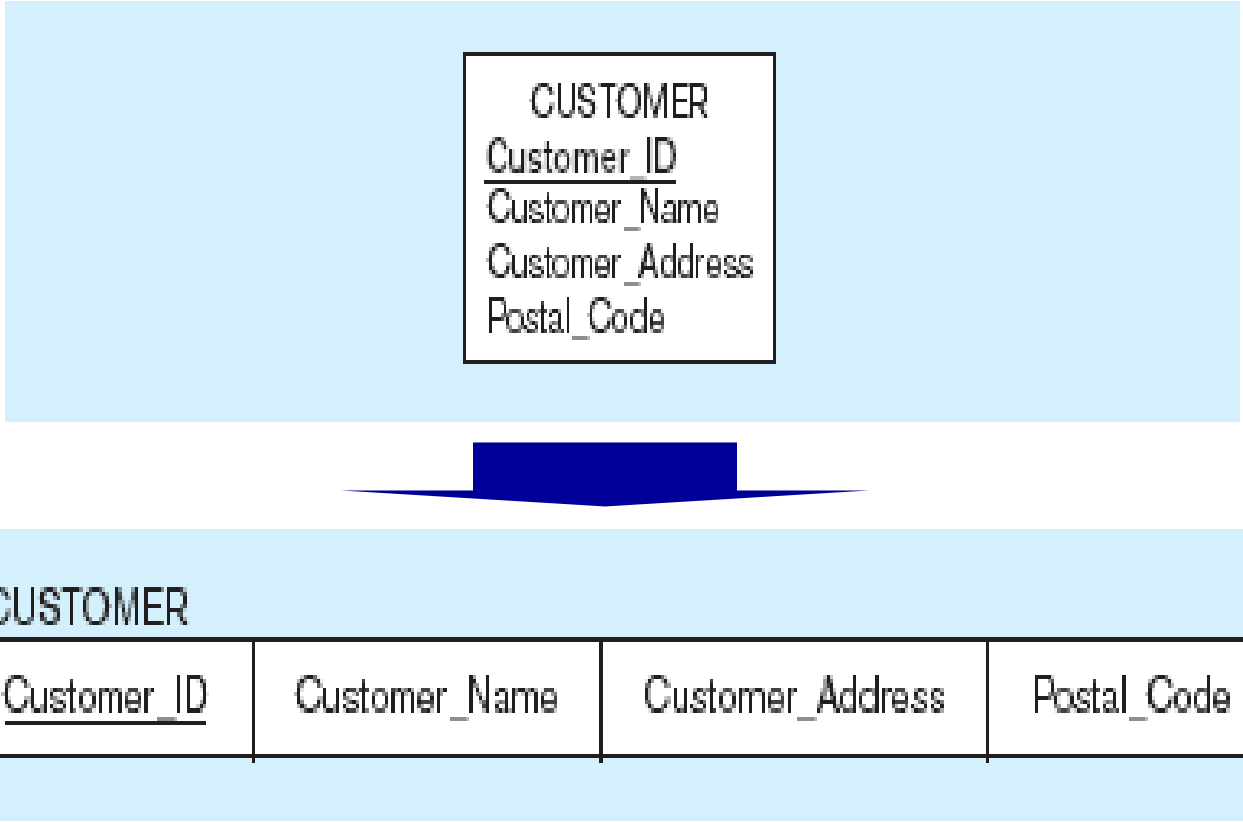
Transforming EER Diagrams into Relations – Entities

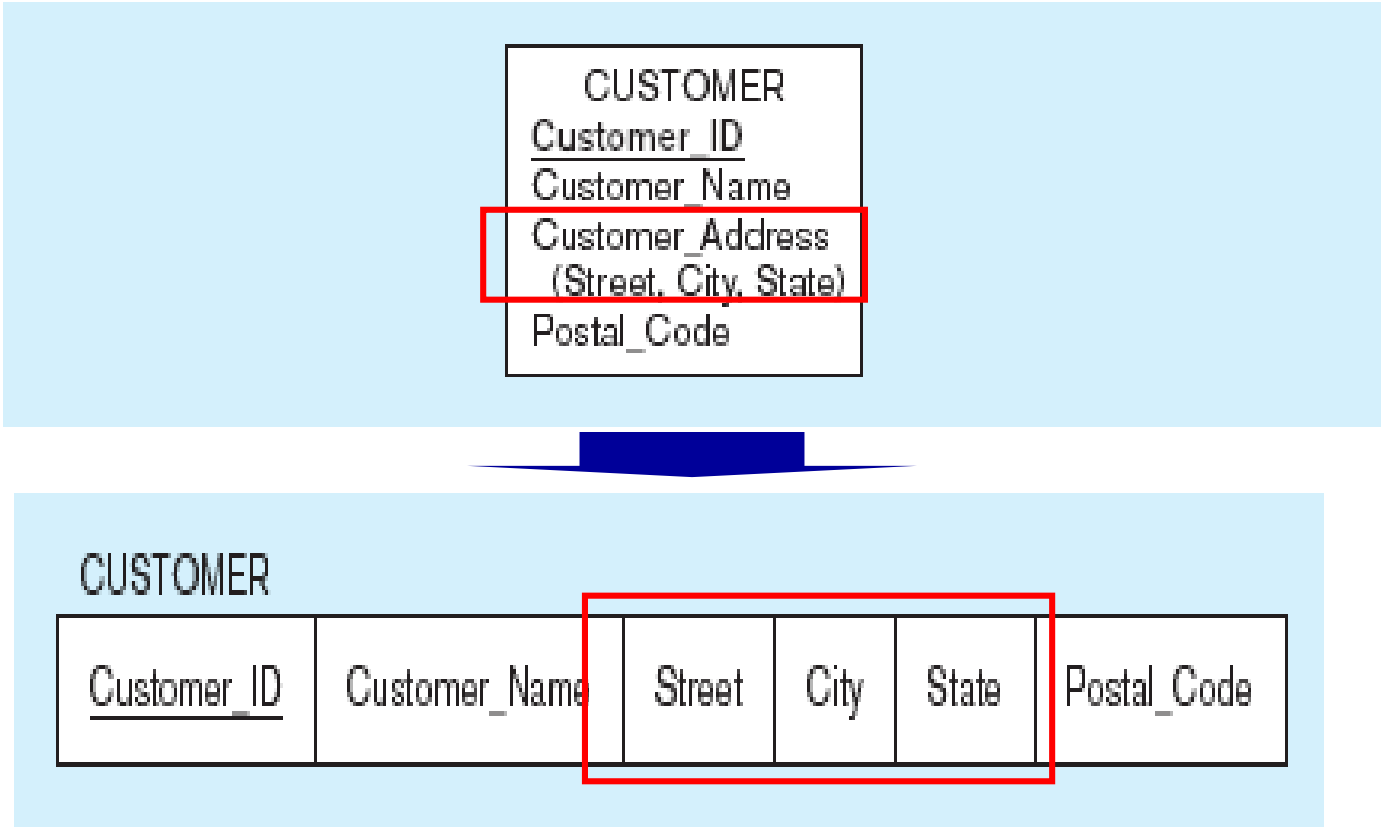
Mapping regular entities to relations

1. **Simple attributes**: E-R attributes map directly onto the relation
2. **Composite attributes**: Use only their simple, component attributes
3. **Multivalued Attribute**: becomes a separate relation with a foreign key taken from the superior entity

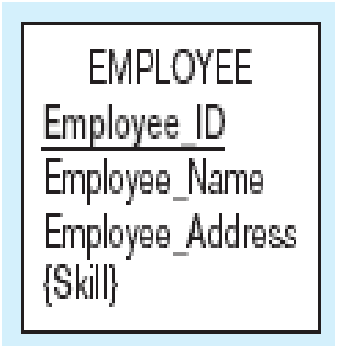
Mapping an Entity with Simple Attributes

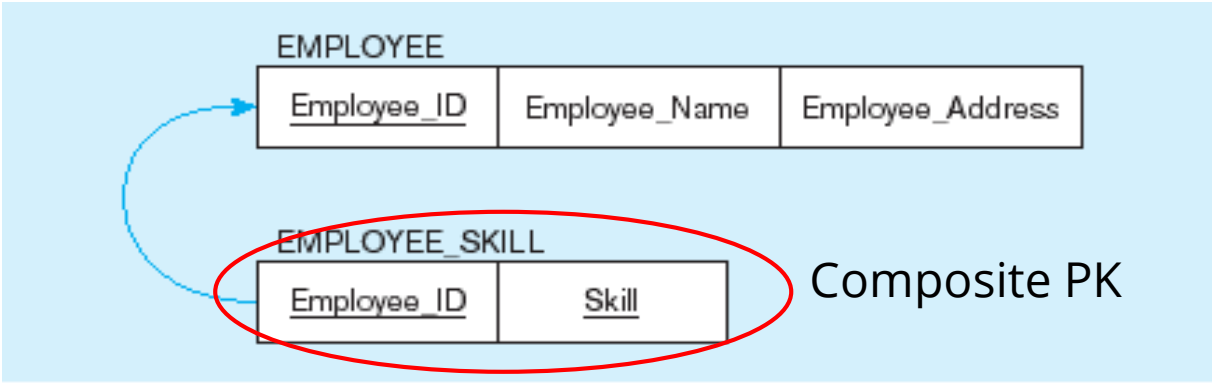


Mapping an Entity with Composite Attributes



Mapping an Entity with Multivalued Attributes





- **A multivalued attribute becomes a separate relation with foreign key**
- **One–to–many relationship between original entity and new relation**

Mapping an Entity with Multivalued Attributes

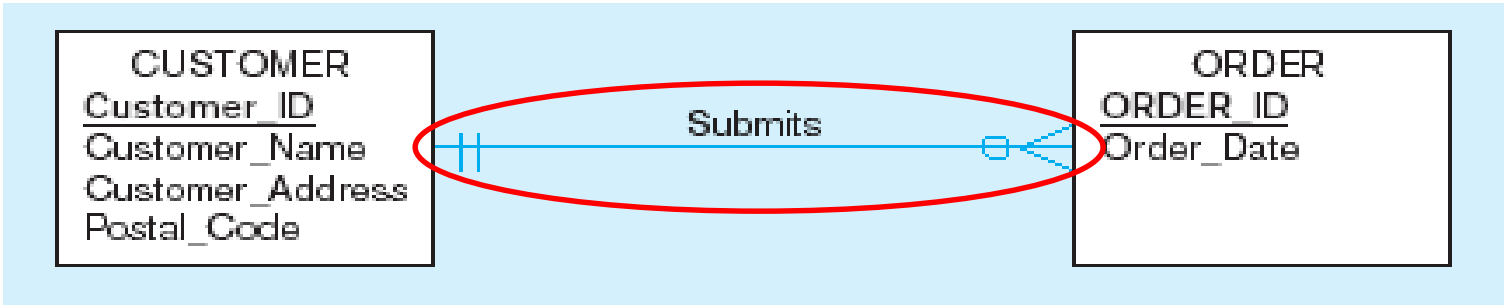
- Create a table for the multivalued attribute
- Name of table is name of the attribute
- Attributes of the table are
  - the PK of the entity set to which the attribute belongs
  - a separate column for the values of the attribute
- PK of the table is all the columns of the table (generally)

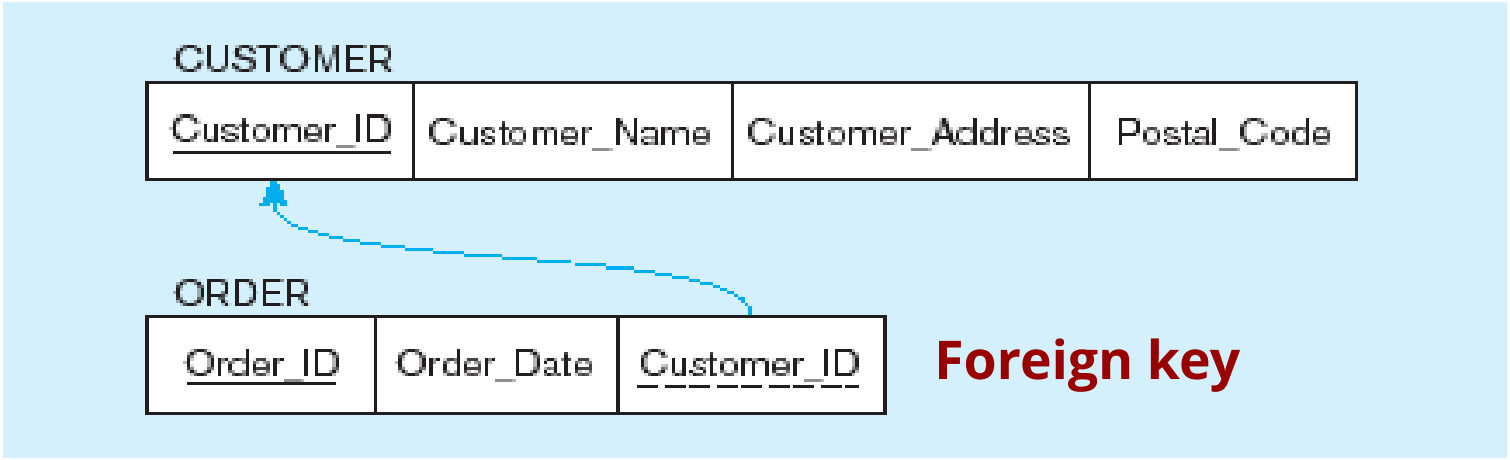
Transforming EER Diagrams into Relations - Relationships

Mapping binary relationships

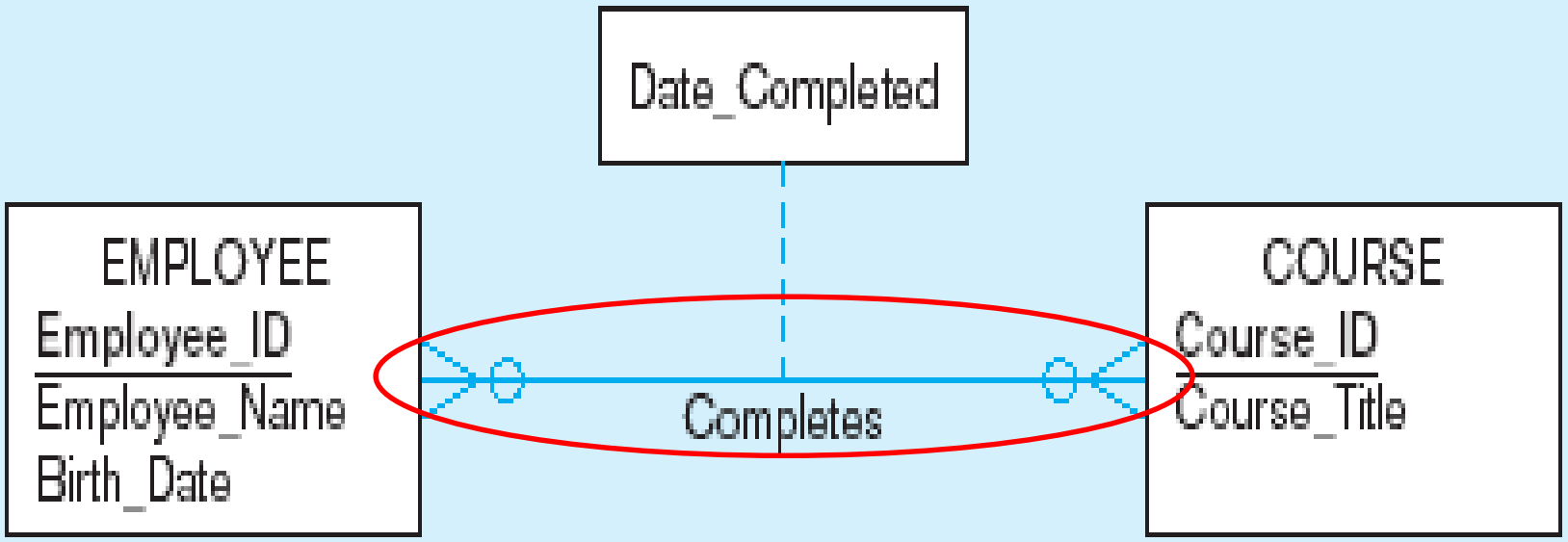
- **One-to-Many:** Primary key on the one side becomes a foreign key on the many side
- **Many-to-Many:** Create a ***new relation*** with the primary keys of the two entities as its primary key
- **One-to-One:** Primary key on the mandatory side becomes a foreign key on the optional side

Example of Mapping a 1:M Relationship



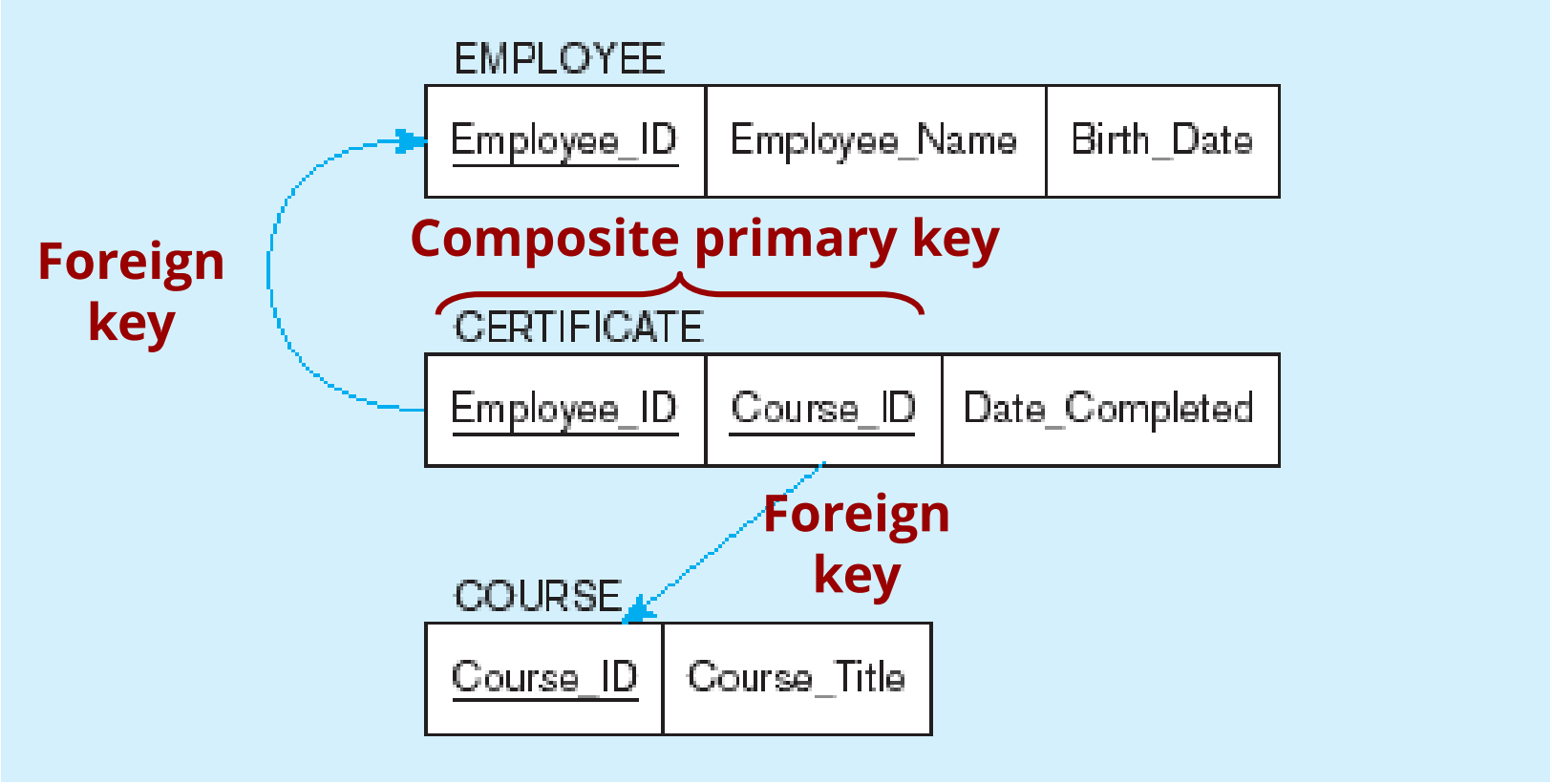


Example of mapping a M:N relationship

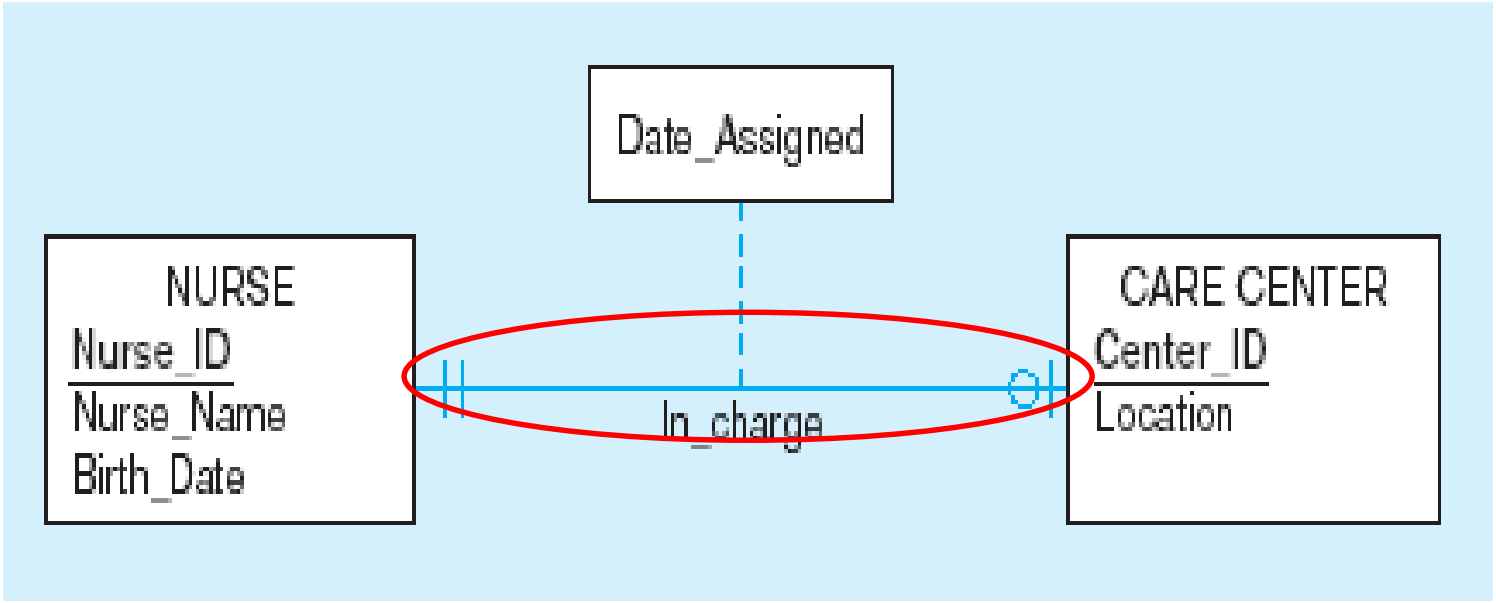


The *Completes* relationship will need to become a separate relation

Example of mapping a M:N relationship

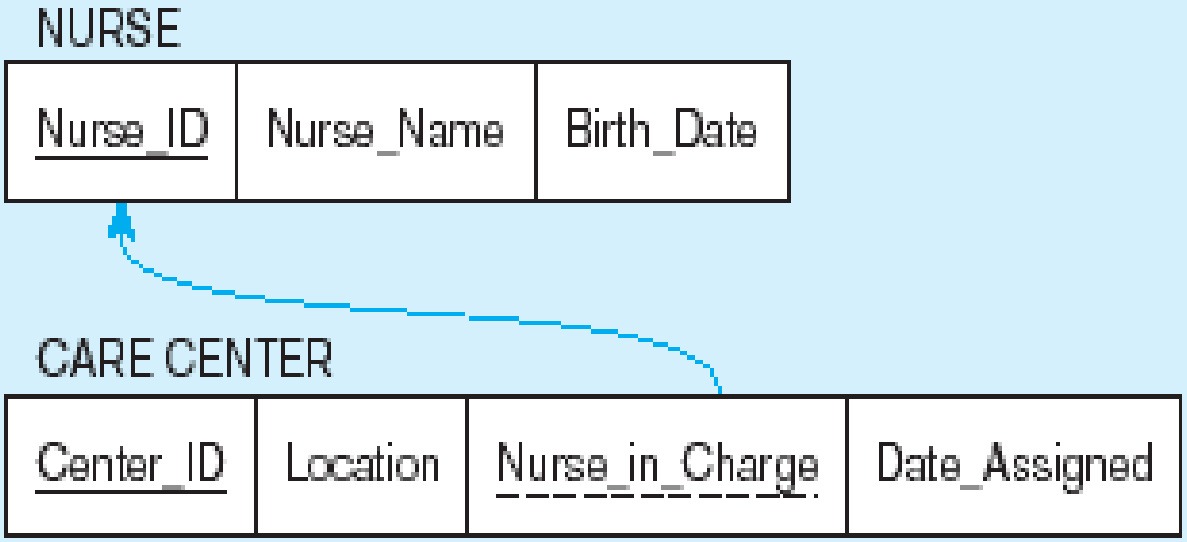


Example of mapping a 1:1 relationship



Often in 1:1 relationships, one direction is **optional**

Example of mapping a 1:1 relationship



Foreign key goes in the relation on the **optional** side, Matching the primary key on the mandatory side

Wrap-Up

- Transforming ERD into relations
  - Simple, composite, multivalued attributes
  - 1:1, 1:M, M:N relationships