

The Enhanced E-R Model and Business Rules

EERD

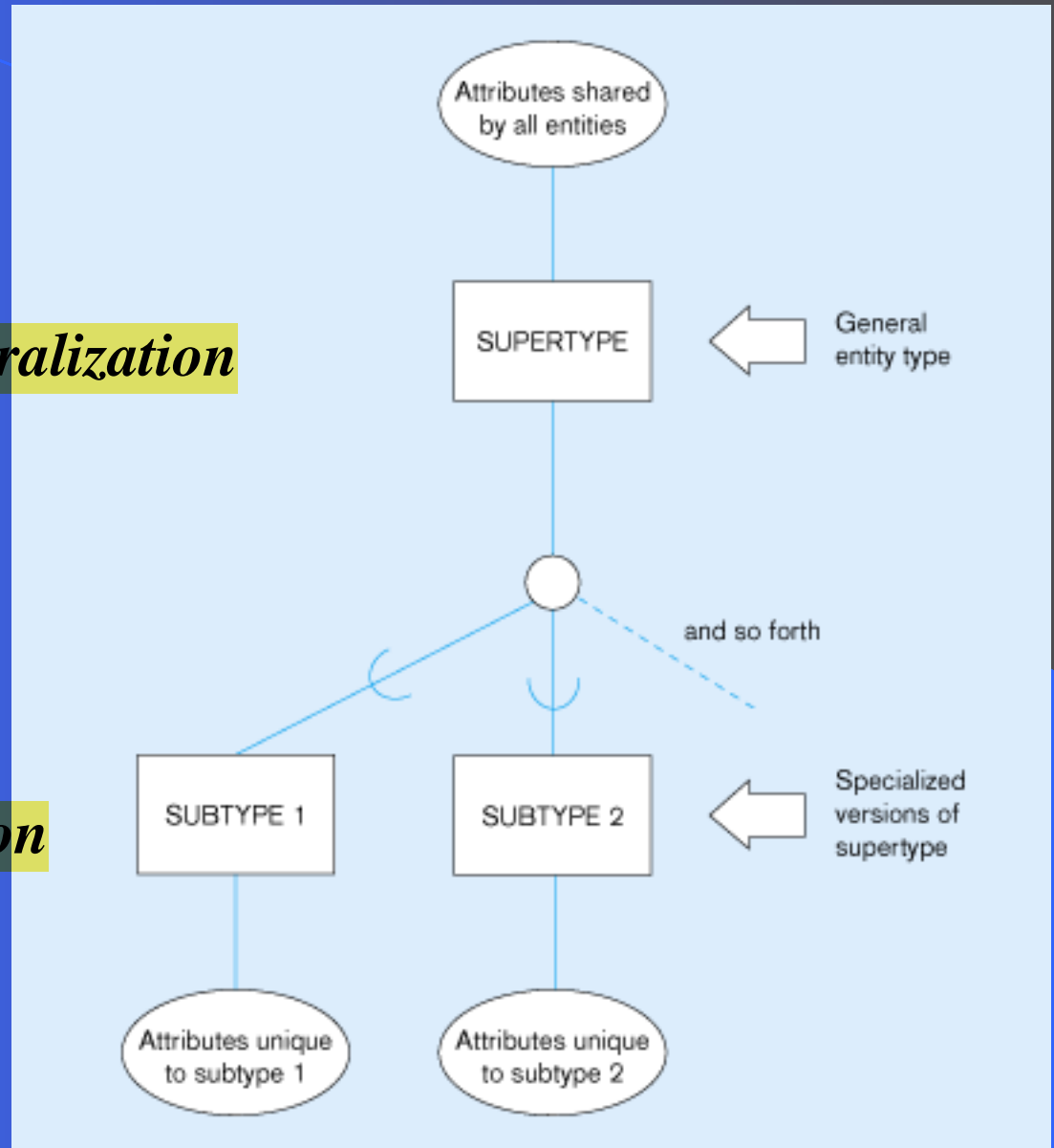
✓ Supertypes and Subtypes

- **Subtype:** A subgrouping of the entities in an entity type which has attributes that are distinct from those in other subgroupings
- **Supertype:** An generic entity type that has a relationship with one or more subtypes
- **Inheritance:**
 - Subtype entities inherit values of all attributes of the supertype
 - An instance of a subtype is also an instance of the supertype

Basic notation for supertype/subtype relationships

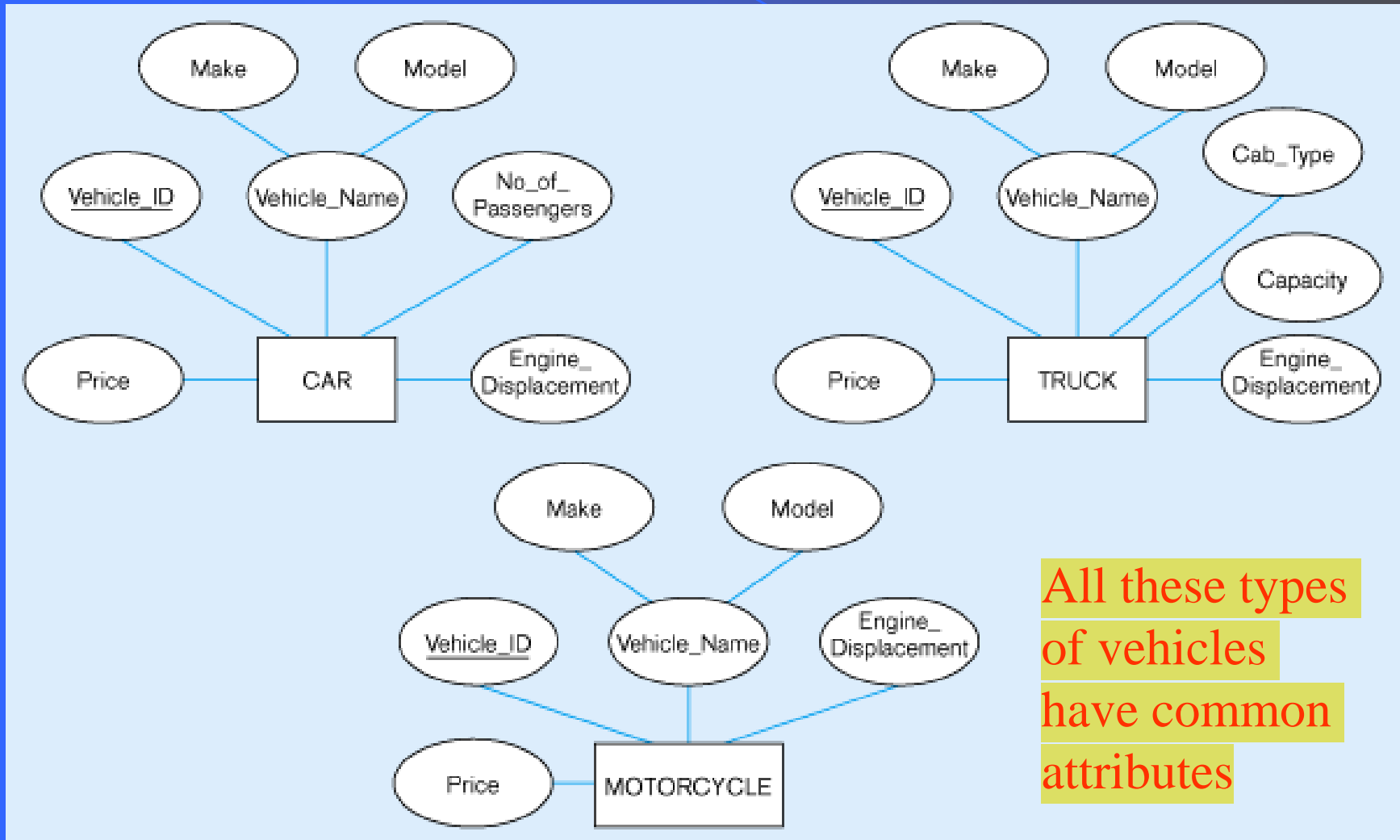
Generalization

Specialization

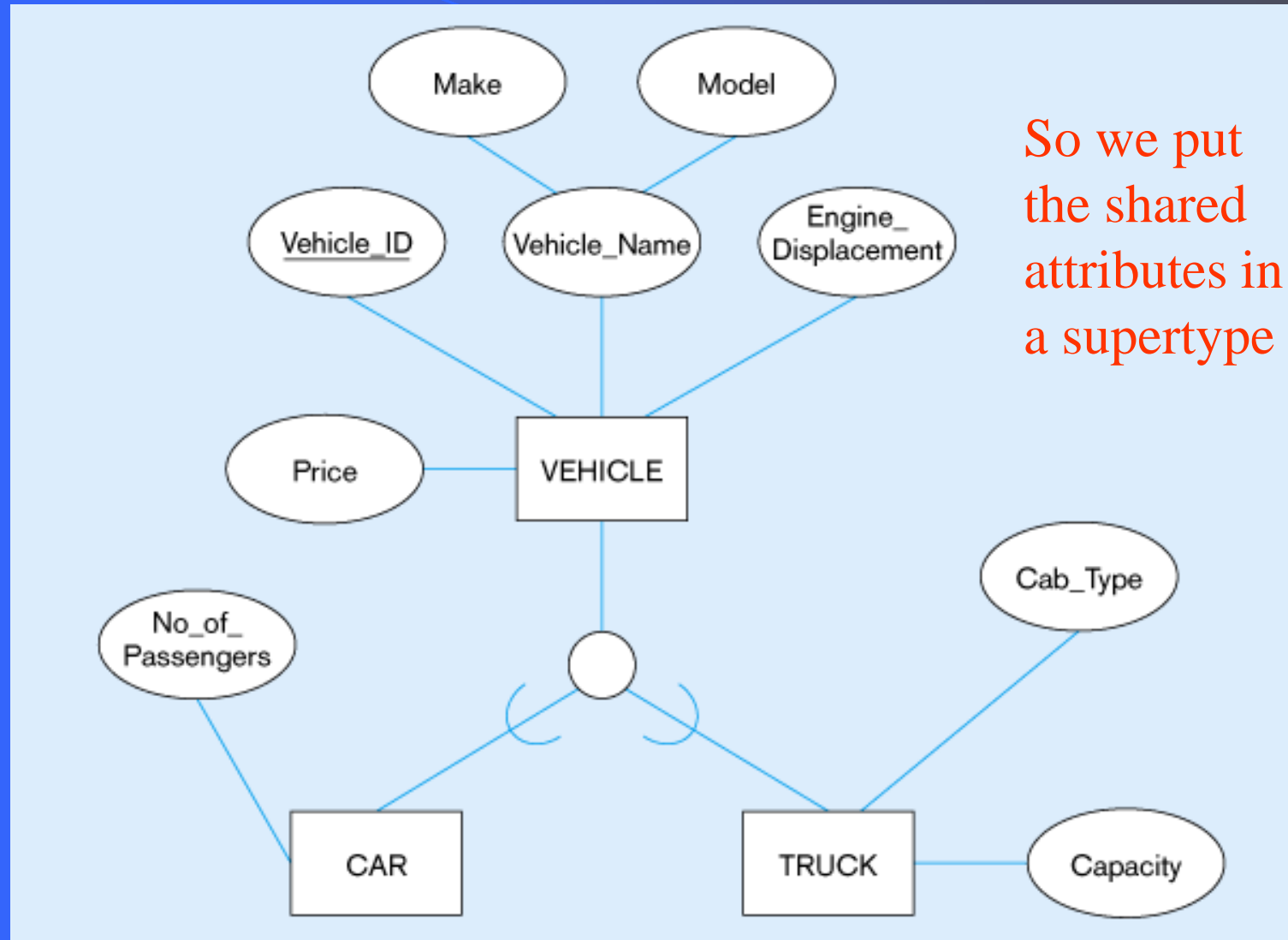


Example of generalization

(a) Three entity types: CAR, TRUCK, and MOTORCYCLE

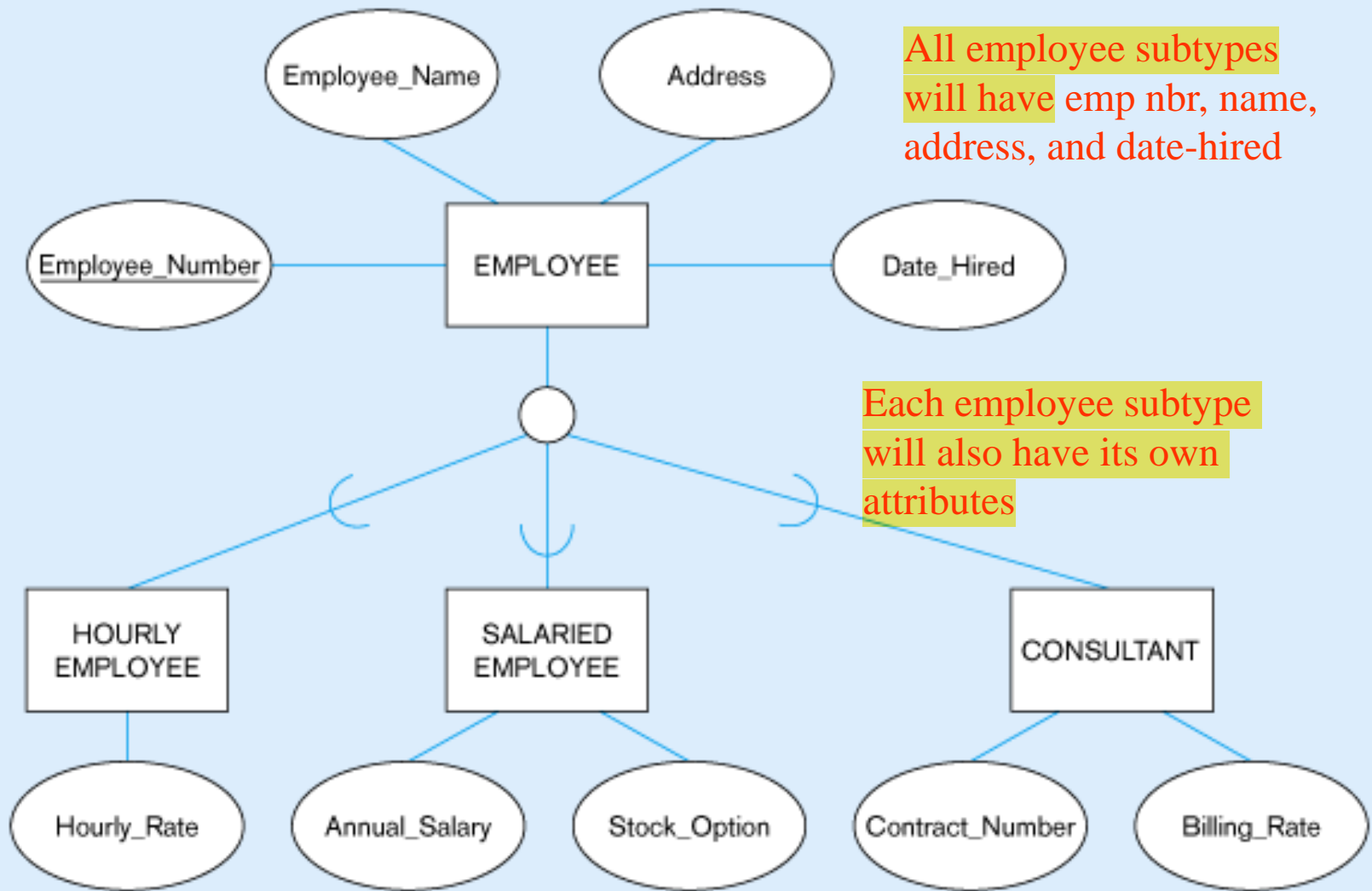


Generalization to VEHICLE supertype



Note: no subtype for motorcycle, since it has no unique attributes

Employee supertype with three subtypes



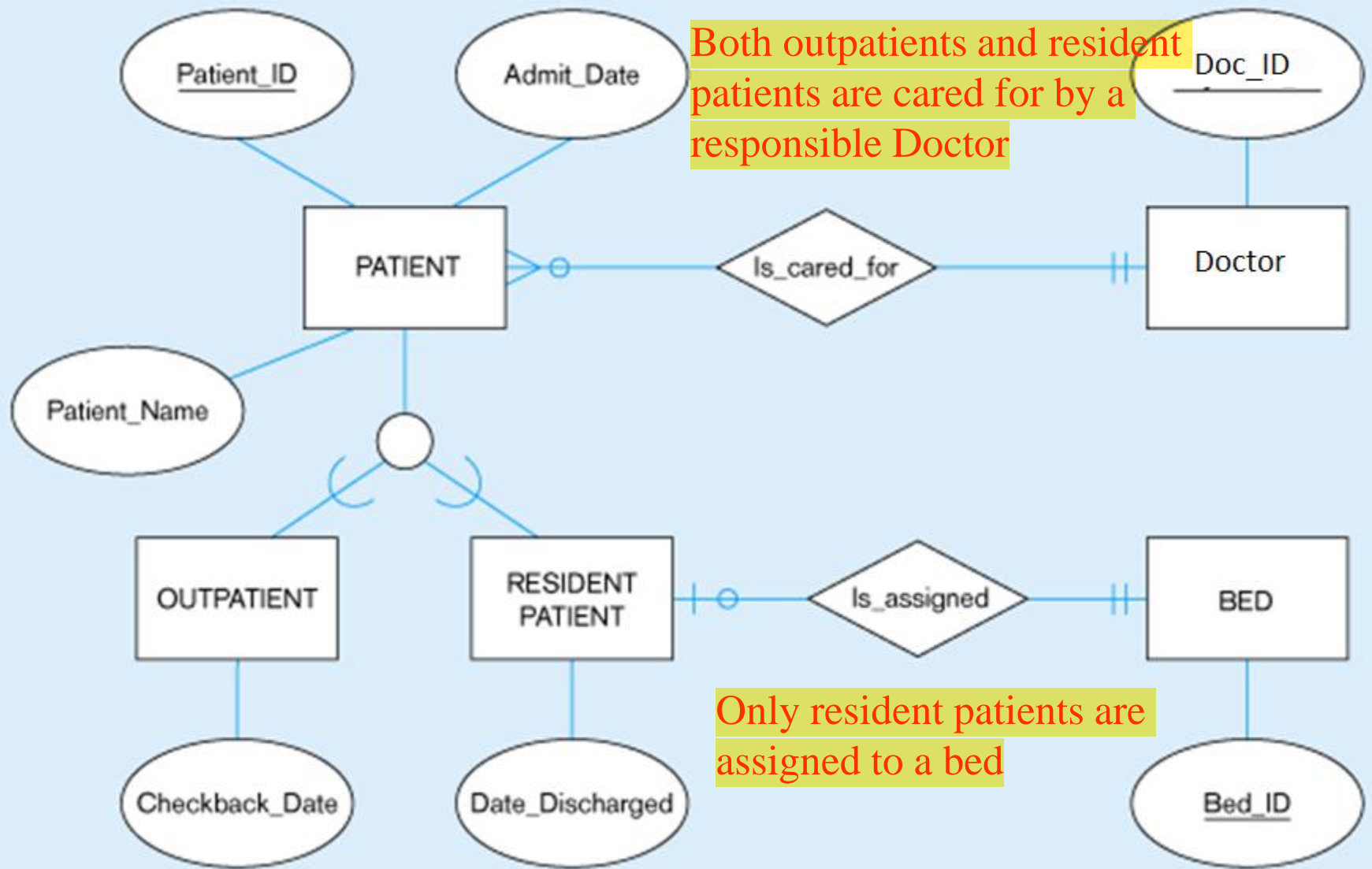


Relationships and Subtypes

Relationships at the *supertype* level indicate that all subtypes will participate in the relationship

The instances of a *subtype* may participate in a relationship unique to that subtype. In this situation, the relationship is shown at the subtype level

Supertype/subtype relationships in a hospital



Constraints in Supertype

Completeness Constraints:

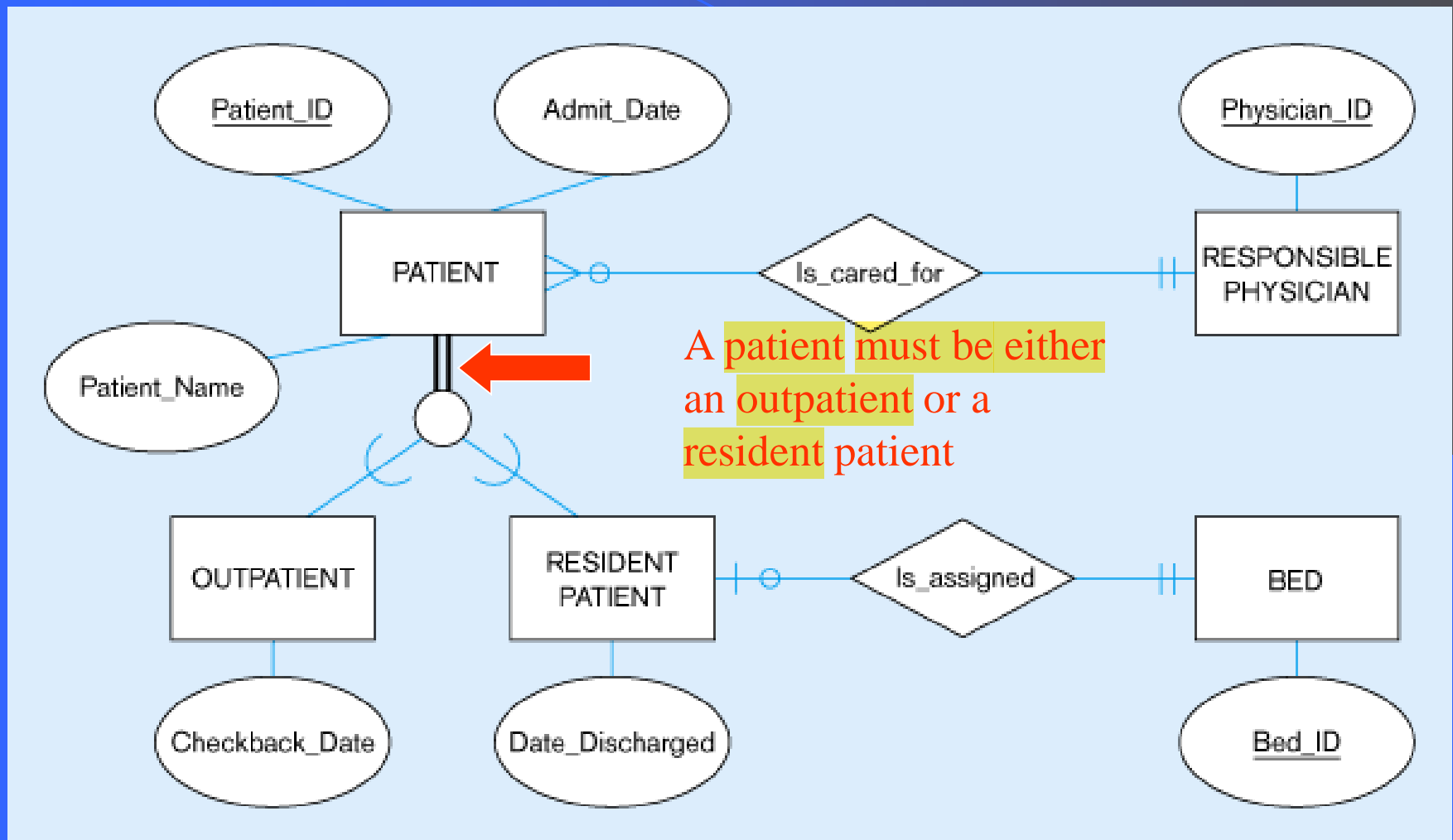
- Total Specialization Rule: Yes (double line)
- Partial Specialization Rule: No (single line)

Disjointness Constraints:

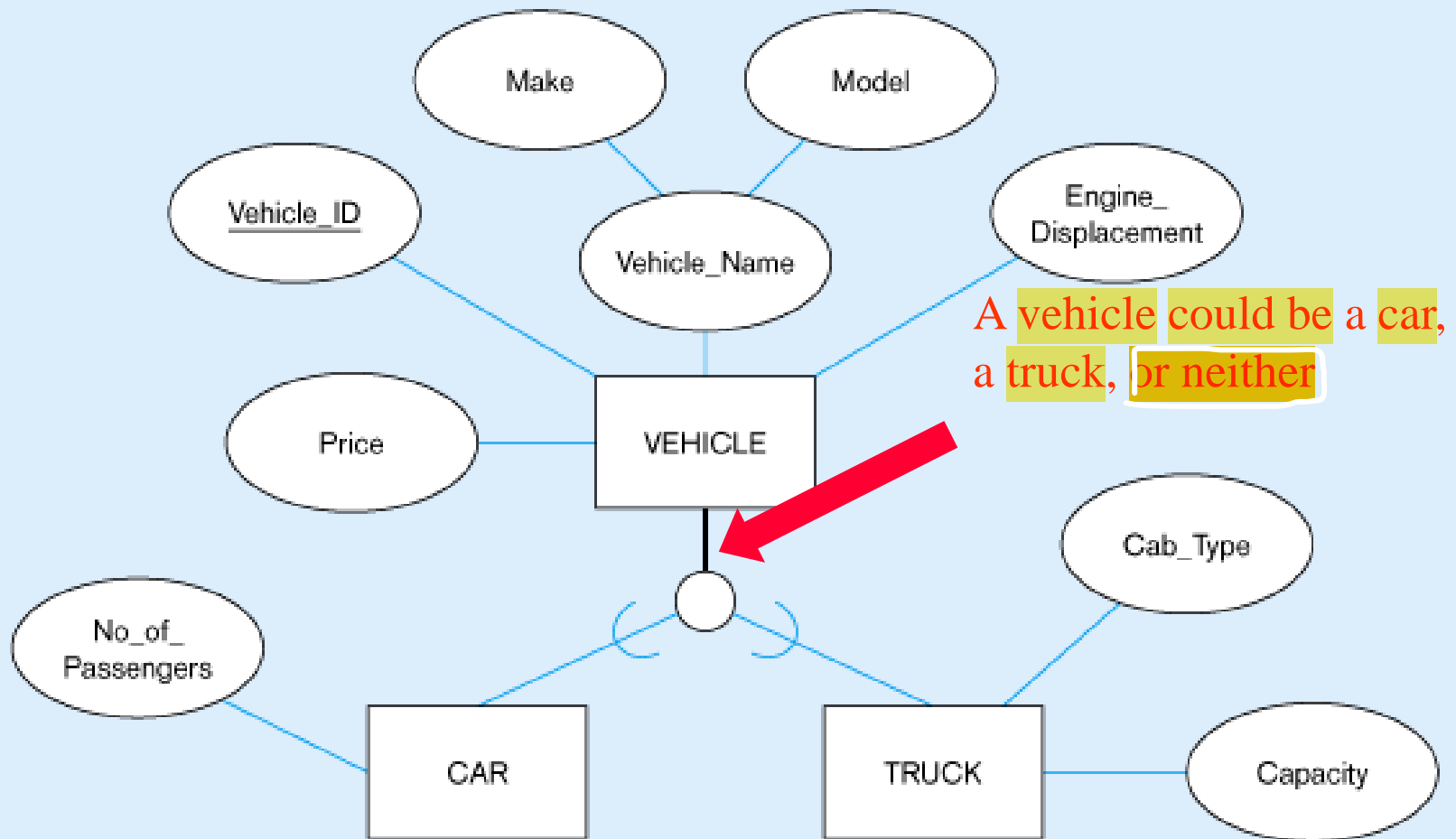
- Total Disjoint (d)
- Overlap Rule (o)

Examples of completeness constraints

Total specialization rule

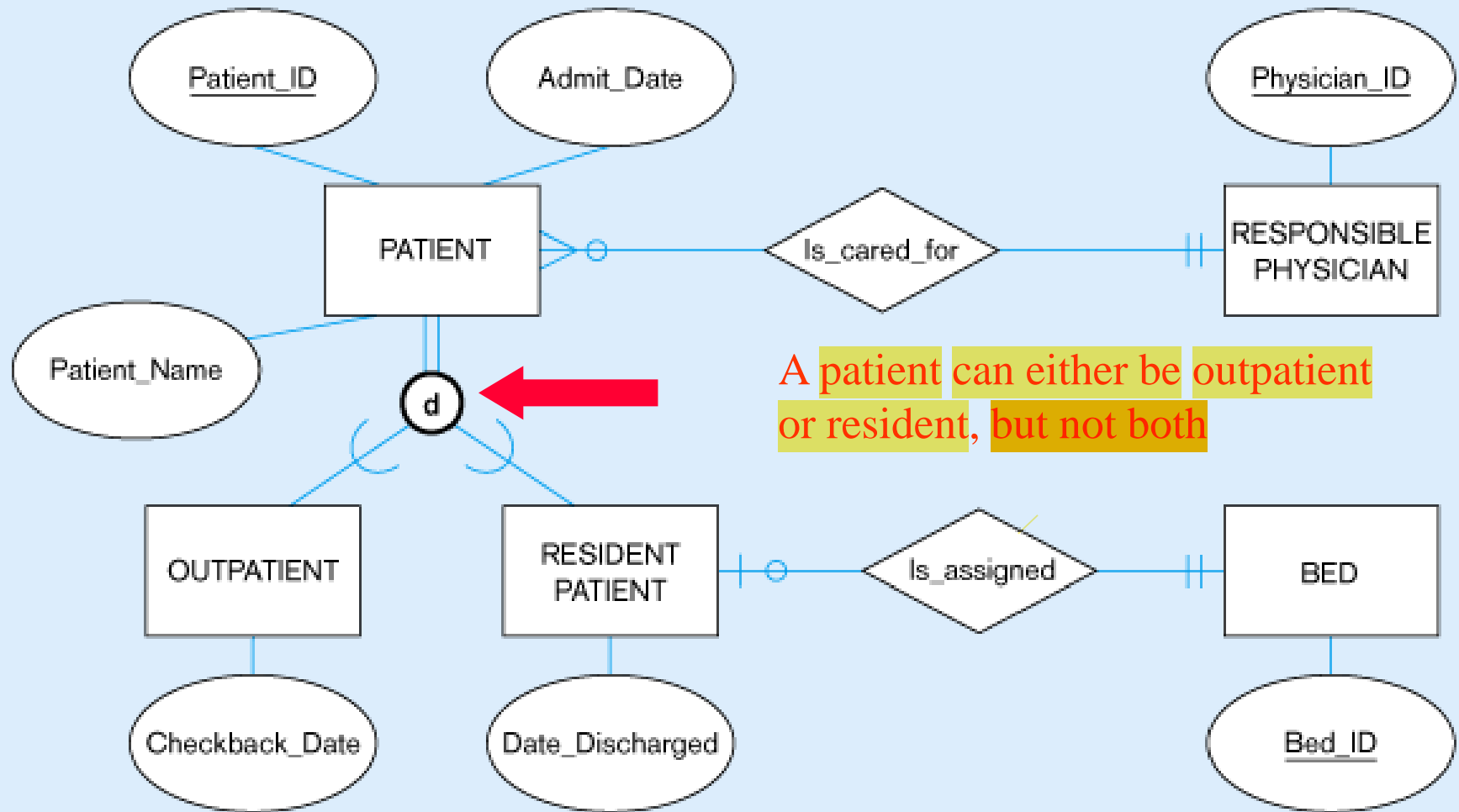


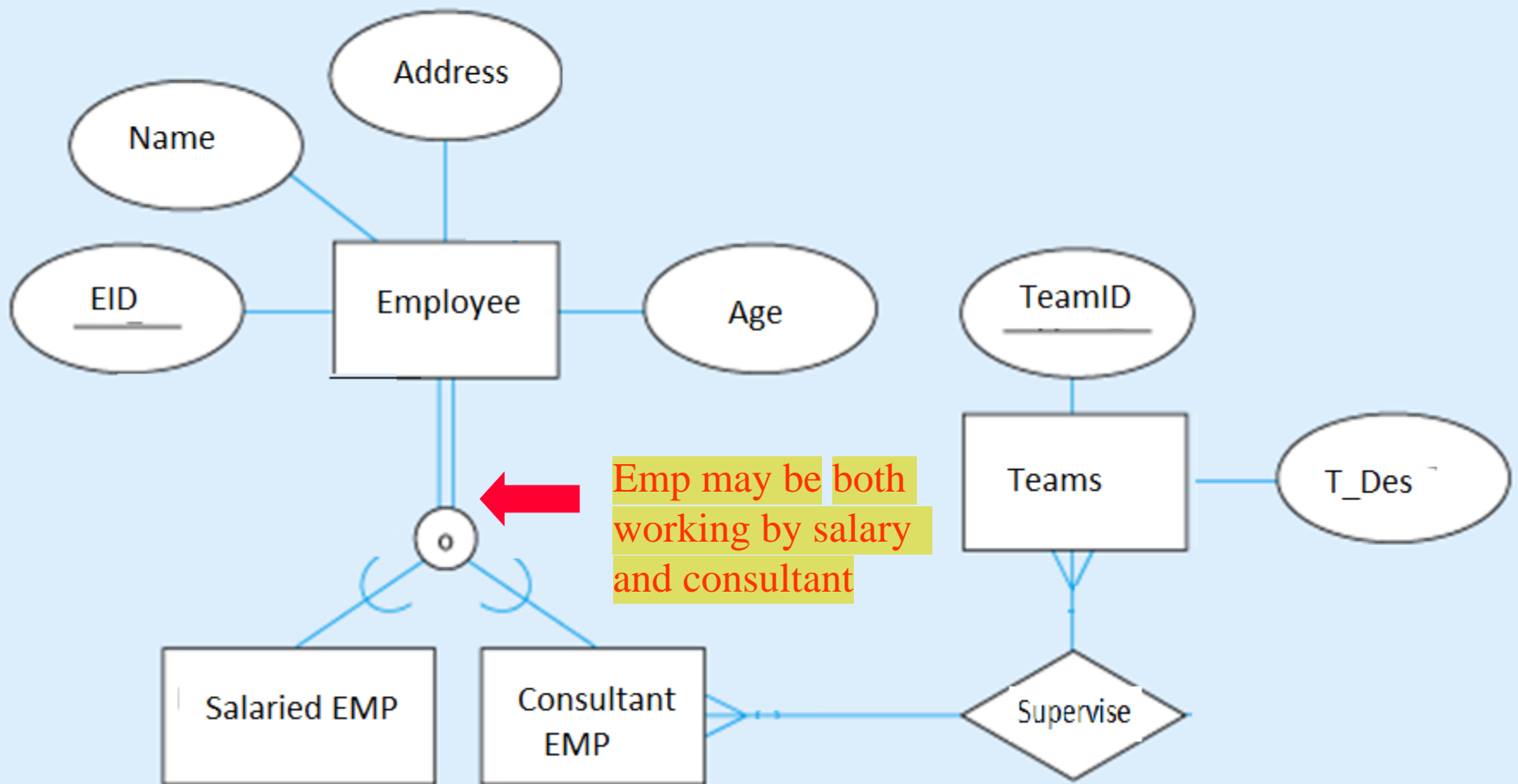
Partial specialization rule



Examples of disjointness constraints

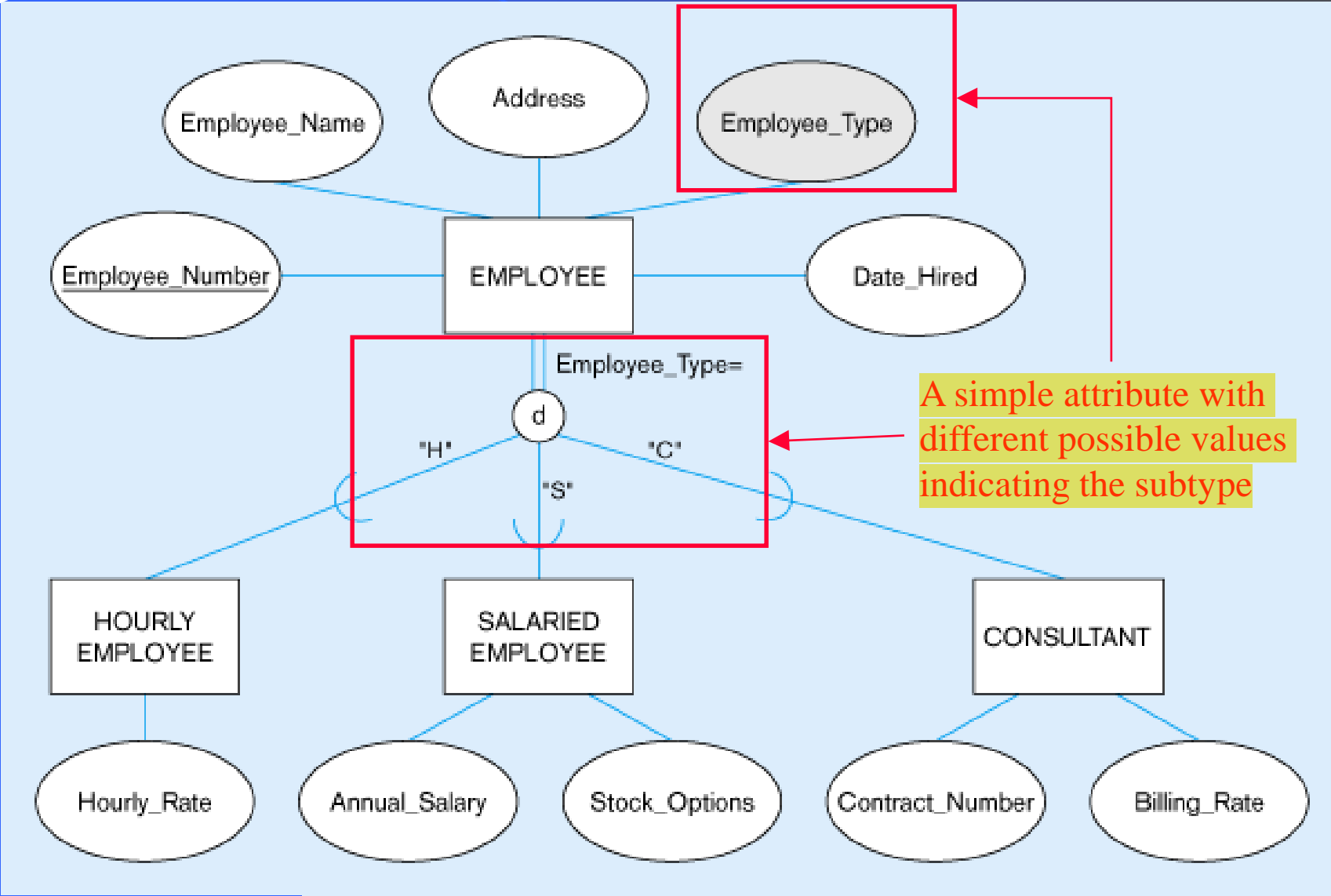
Disjoint rule



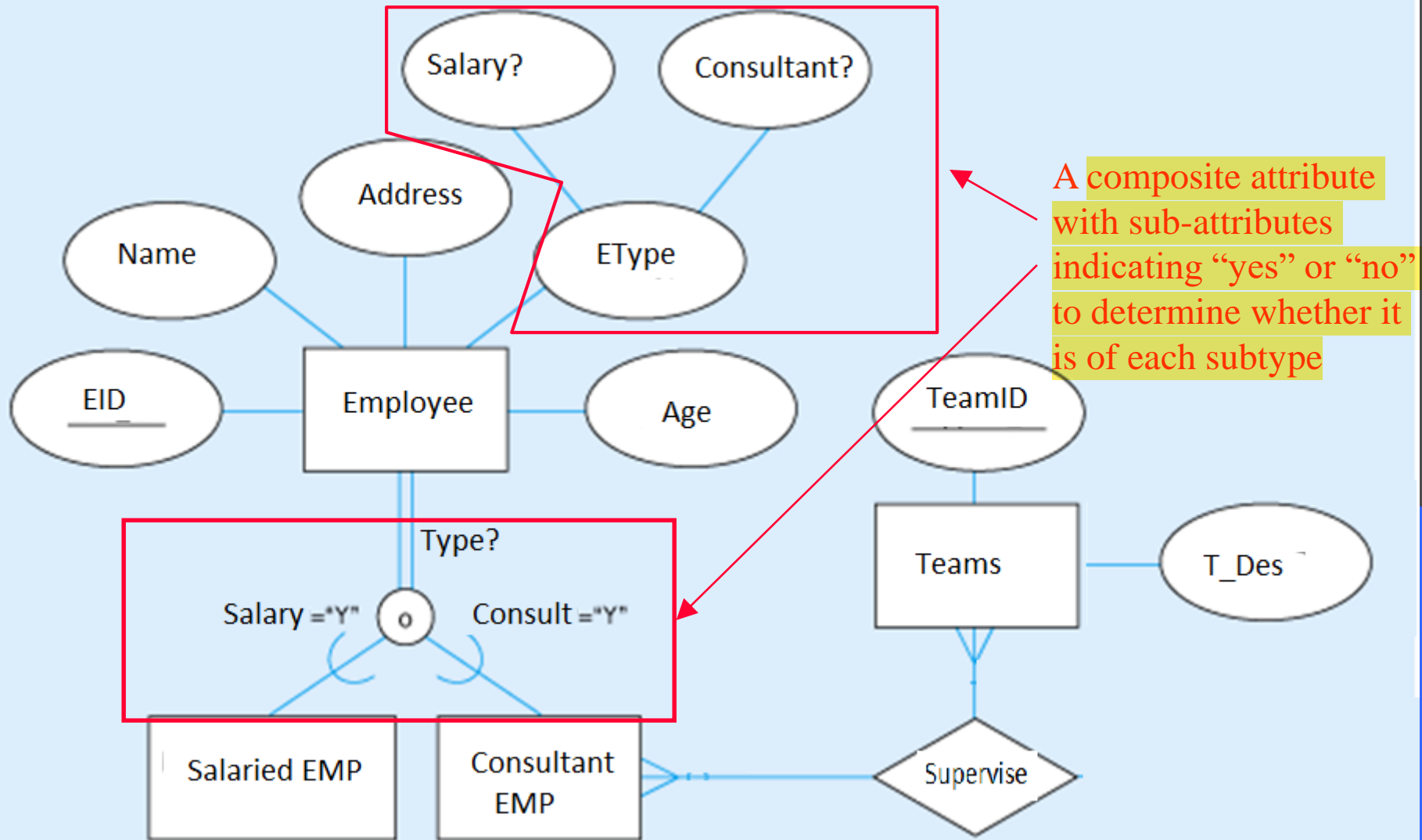


Overlap rule

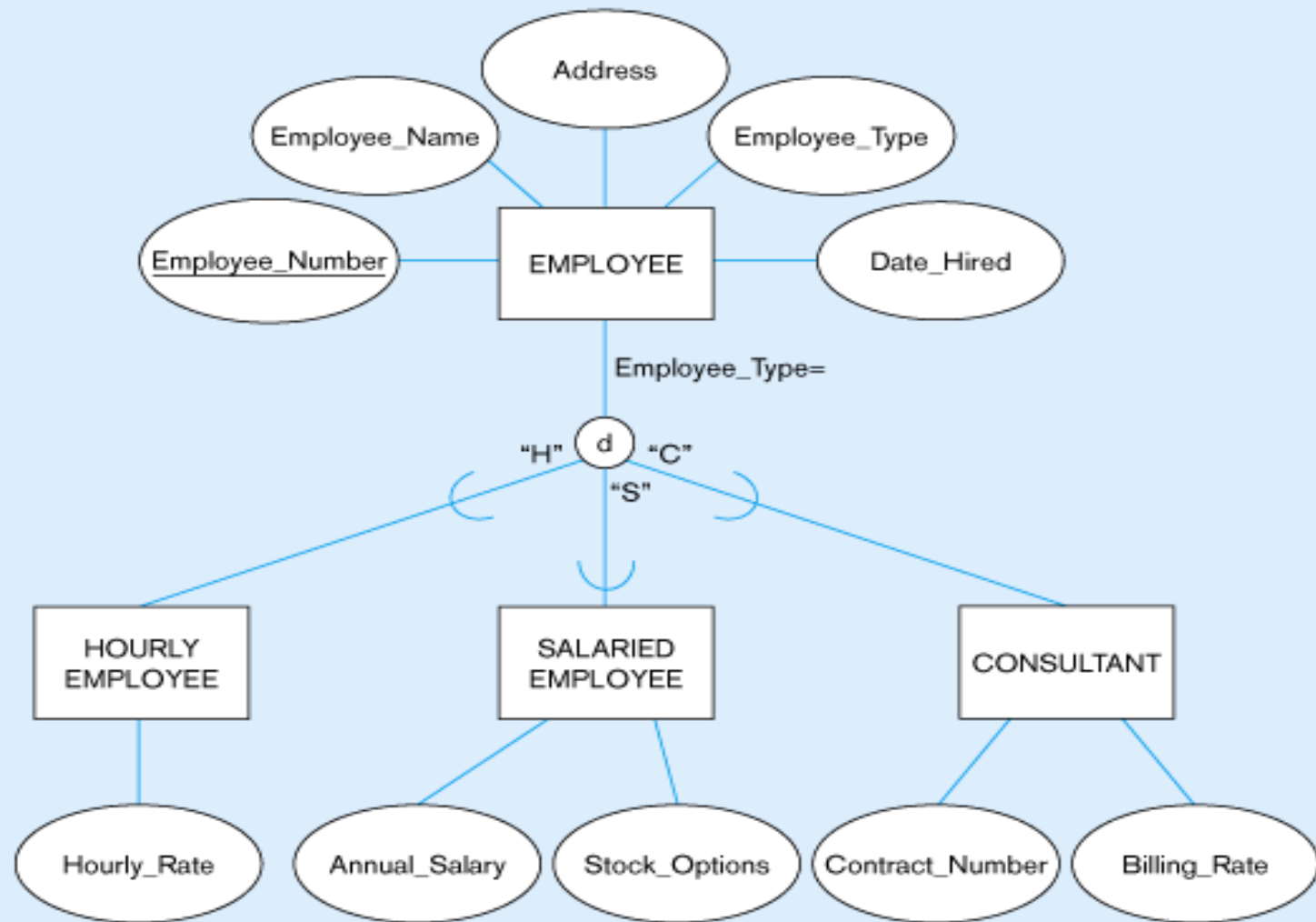
Introducing a subtype discriminator (*disjoint* rule)



✓ Subtype discriminator (**overlap** rule)



✓ Transforming EER Diagrams into Relations



Mapping Supertype/subtype relationships to relations

