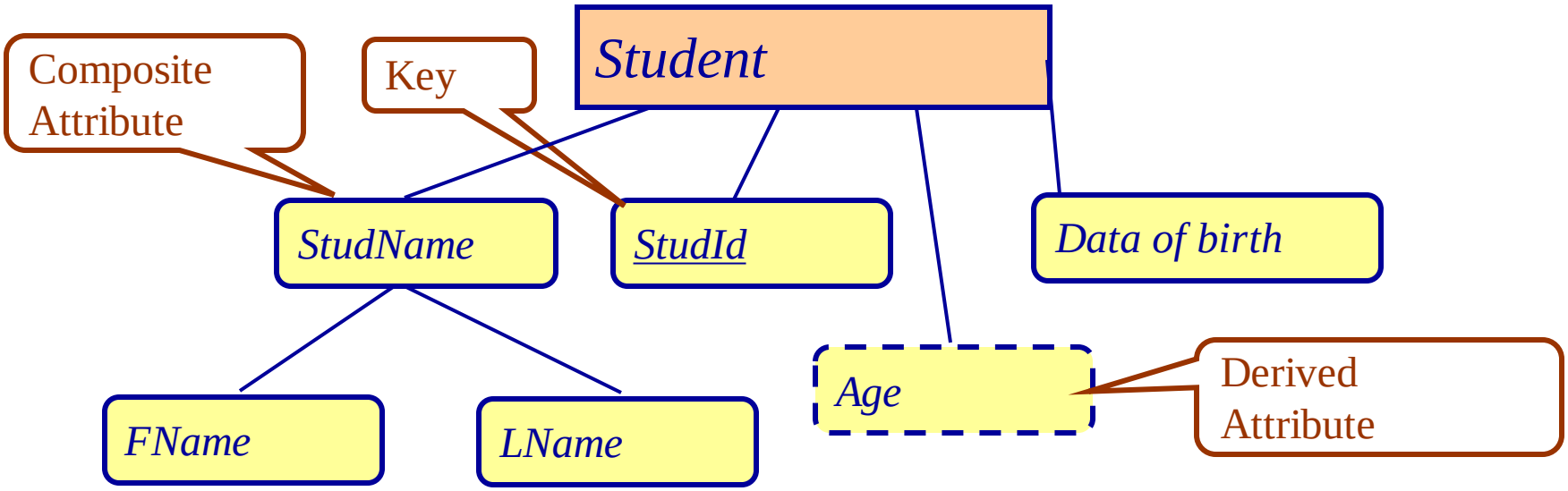
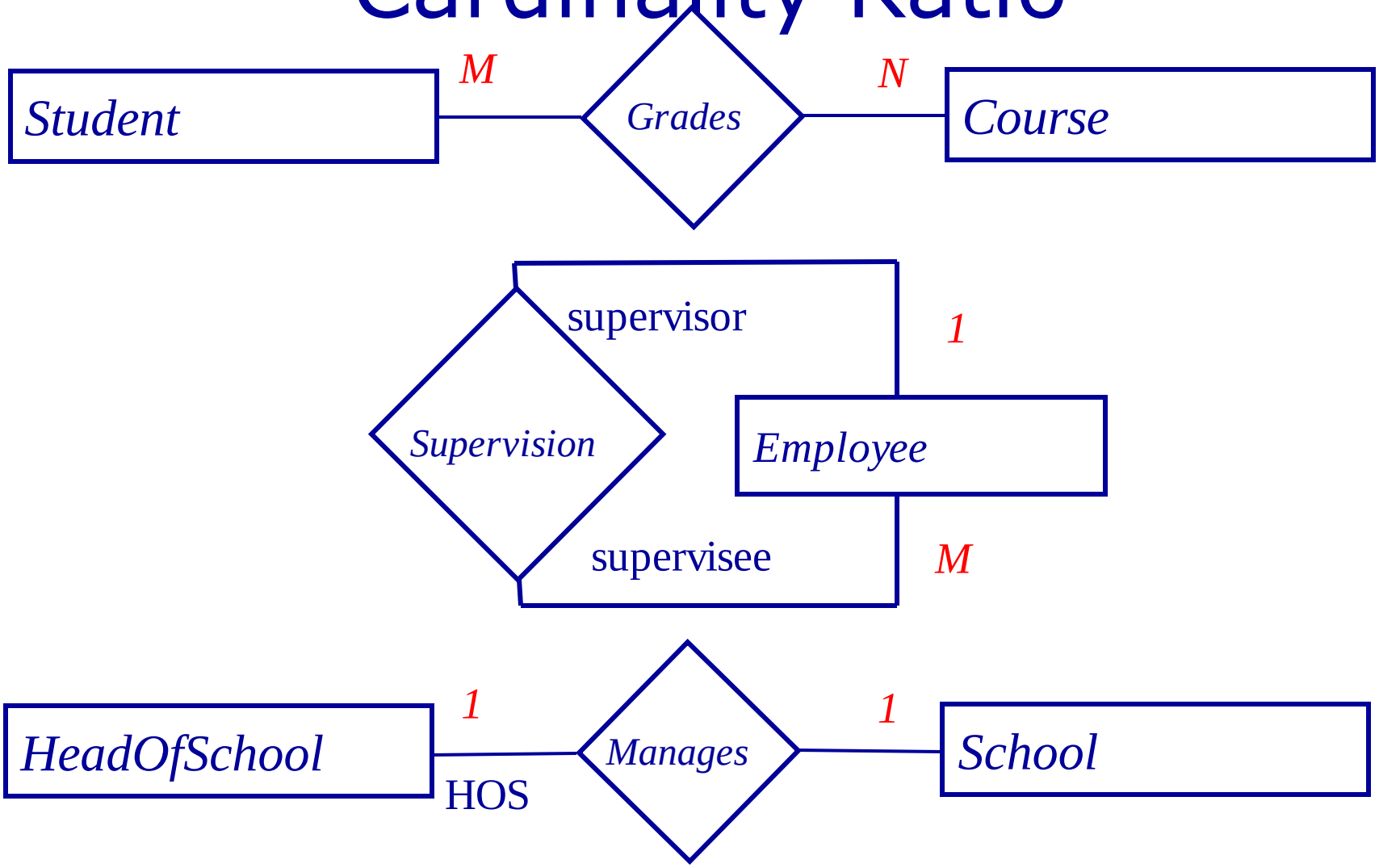
Student Entity



Cardinality Ratio



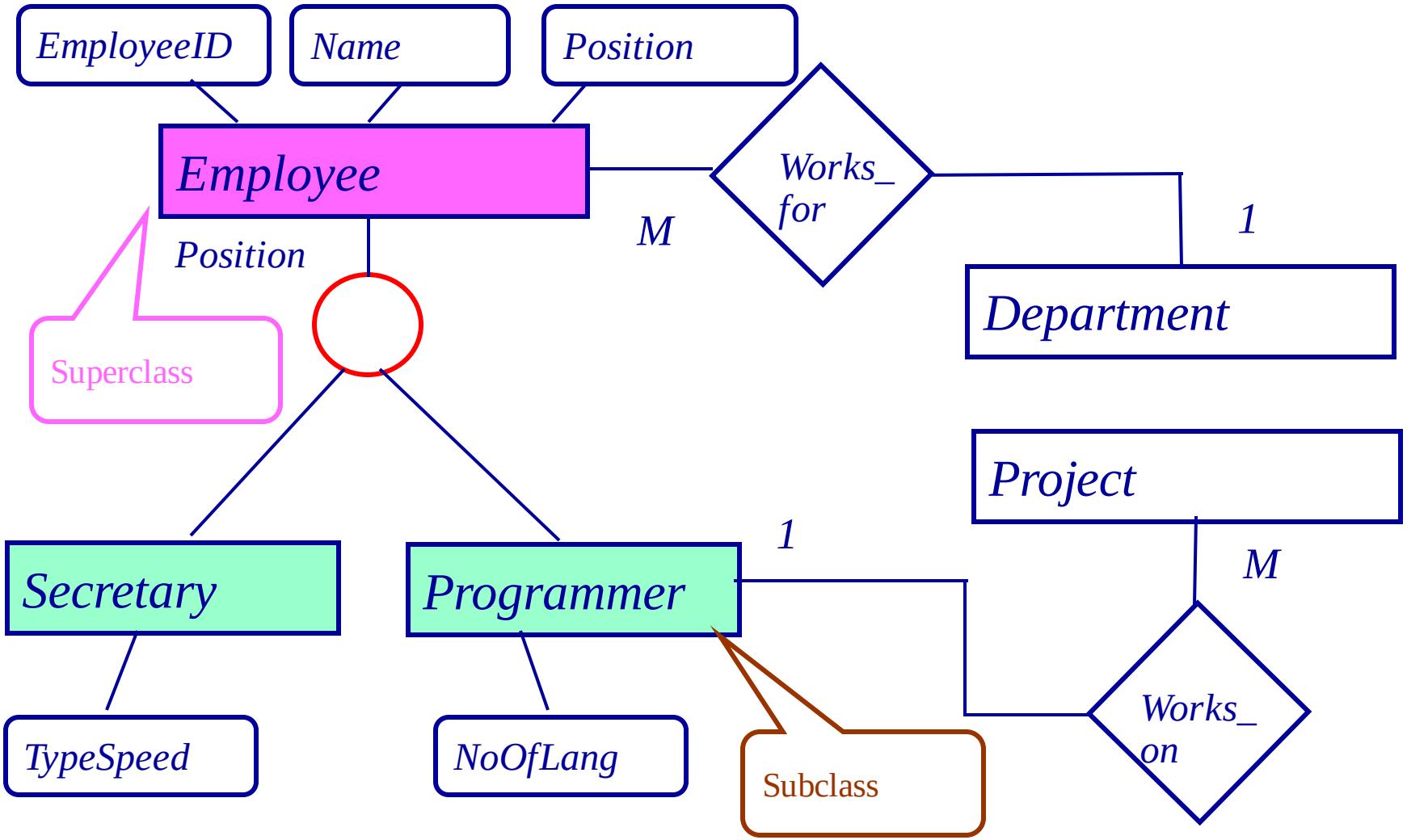
Enhanced ER Data Model

- Enhanced ER data model brings a number of new concepts:
  - ***Supercalss / subclass*** relationship

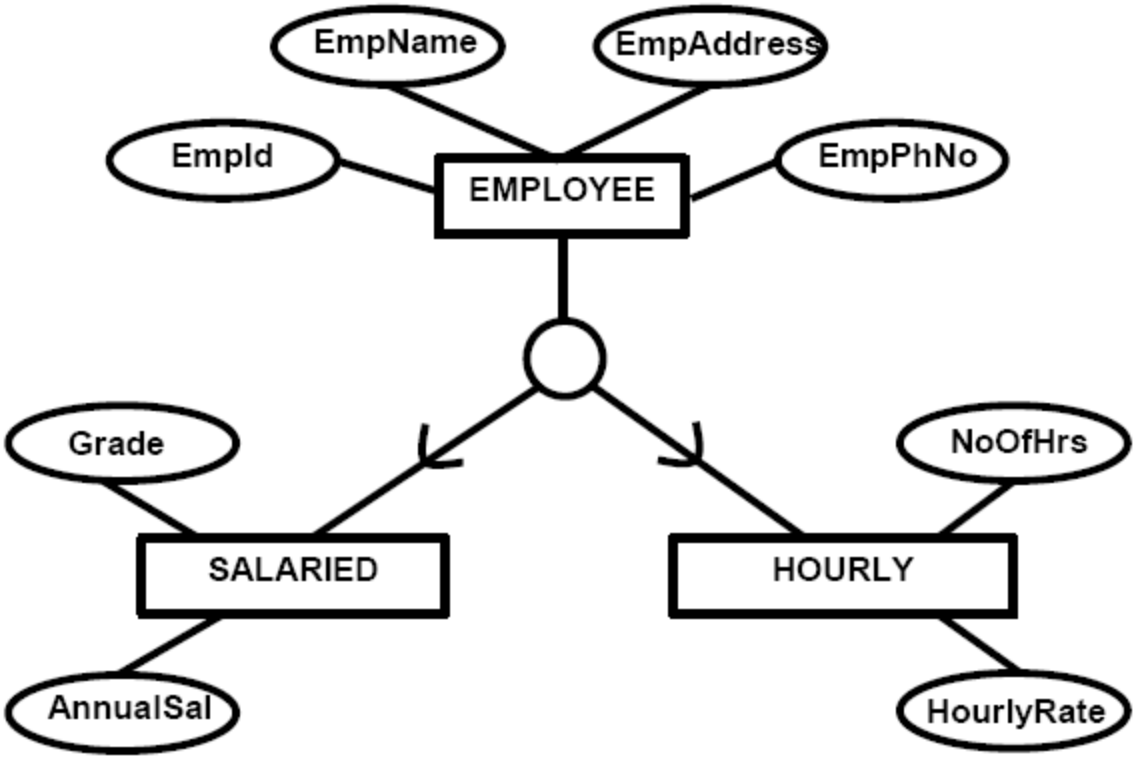
Superclass / Subclass Relationship

- An entity class can posses groups of such entities that contain some special properties, not immanent to the other ones
- e.g.
  - Person class contains many such groups like: students, employees, children, retired,…
  - Student class may be divided into full time and part time students, or undergraduate, graduate, master, and doctorate students
- To enhance the semantic power of the ER data model, there is a superclass / subclass relationship introduced

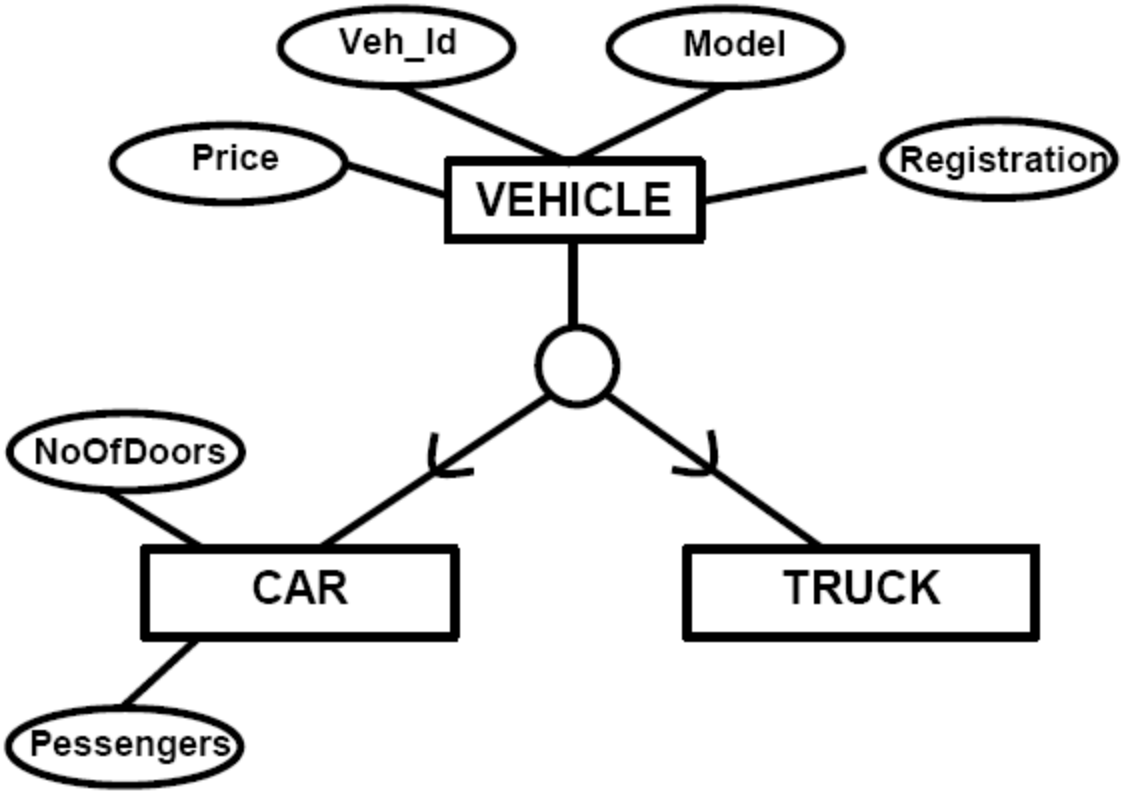
Superclass / Subclass Relationship



Superclass / Subclass Relationship



Superclass / Subclass Relationship



Superclass / Subclass Relationship

- A subclass contains only specific attributes and may participate in relationship types by its own
- A subclass is a specialization of its superclass
- The superclass is generalization of all its subclasses
- Specialization and generalization are inverses of each other
- An instance of the subclass is also an instance of the superclass
- These two instances represent the same real entity
- A subclass instance inherits all the superclass attribute values and all relationship participations from its image in the superclass

Entity Type

- **Strong Entity Type**
  - **Entity type that is *not* existence-dependent on some other entity type.**
- **Weak Entity Type**
  - **Entity type that is existence-dependent on some other entity type.**

Weak Entity Type Examples