Conceptual Design (continued)
Projet base de donnèes – ENS Cachan

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Enhanced Entity-Relationship Model

Extension

More complex databases require more precise modelling, capturing more semantic constraints between entities. As a result enhanced entity-relationship model was created, by incorporating the notion of inheritance.

Inheritance

Principle

- An entity type, called supertype, can be extended by several other entity types, called subtypes.
- Entity set of a subtype is a subset of the entity set of the supertype.
- Subtypes inherit all attributes and relationships of its supertypes, but can specify additional local attributes and local relationships.
- Specialisation and generalisation are two design approaches to introduction of inheritance.

Constraints

Constraints on inheritance

- **Defining predicate**, a property of the entities of supertype that separates them into different subtypes.
- **Disjointness**, how many subtypes can each entity of the supertype belong to.
- **Completeness**, specifies whether all entities of the supertype belong to certain subtype.

Multiple Inheritance and Union Types

Multiple Inheritance

An entity type can be a subtype of several supertypes, inheriting all their attributes and relationships. If several paths from a single supertype lead to the same subtype, only one copy of its attributes/relationships is carried over.

Union Type

A union type is a subtype of several supertypes, however, the entities of union type only exist in one of the supertypes. Likewise, union types only inherit attributes and relationships of the relevant supertype. Union types typically serve as interface between several entity types that can act in the same role.