COS 425: Database and Information Management Systems

Final concept in Entity-relationship (ER) model

Richness of ER model

SEEN 1. Tuples can be composed of tuples – hierarchy:
   • Relationship tuples composed of entity tuples
   • By aggregation, relationship tuples can contain relationship tuples

NEW 2. Inheritance for entities:
   • An entity type can be further refined

Inheritance hierarchy for entities
We just declared constraints:

1. A book is published by at most one publisher (key constraint)

2. Every authored book is written by some author (total participation constraint)

3. Every edited book is edited by some editor (total participation constraint)
Constraints on “is a” decomposition

- **Covering**
  - If union of subclasses = superclass
  \[ S = S_1 \cup S_2 \]

- **Overlapping**
  - If subclasses can overlap
  \[ S_1 \cap S_2 \neq \emptyset \]

Overlapping?  Covering?

- **GENERAL “IS A”**
  - Can have > 2 subclasses for one “IS A”
  - Subclasses can be further refined with “IS A”
    - Deep hierarchy possible
GENERAL “IS A”

- Can have more than one “IS A” refinement for an entity

Another example

Summary

- ER model is rich model for describing objects and their relationships
- Can capture:
  - constraints
  - Aggregations of objects into more complex objects
  - Different decompositions of entity types
  - Deep hierarchy of decomposition
- Model used as first effort to organize information and make precise what is needed