

## Feb 4: Recap of Jan 30 class

- Data Models: E-R and Relational (and some others of mostly historical interest)
- We examined the E-R model
  - Entities, Relationships, and Attributes
  - Diagram-based model
- Talked about Keys
- Some special cases for the E-R model
- Today we'll examine two enhancements of the E-R model that allow representation of some hierarchical information, then move on to the Relational database model.

# Specialization-Generalization (ISA Hierarchy)

- This is a way to represent entity complexity
- specialization: top-down refinement of entities with distinct attributes
  - Entity type BANK ACCOUNT might be subdivided into related but different types CHECKING ACCT and SAVINGS ACCT
- generalization: bottom-up abstraction of common attributes
  - Course types DATABASE, SYSTEM, and NETWORK all have common attribute (project). From them we can abstract a new course type PRACTICAL COURSE
  - other common course attributes are included (e.g., course number)

# ISA Hierarchy Example: Top-down Refinement

- *Account* entity with attributes *balance* and *number*
- additional complexity: we want to represent two subtypes of account
  - *Savings Account* with attribute *Interest Rate*
  - *Checking Account* with attribute *Overdraft Limit*

