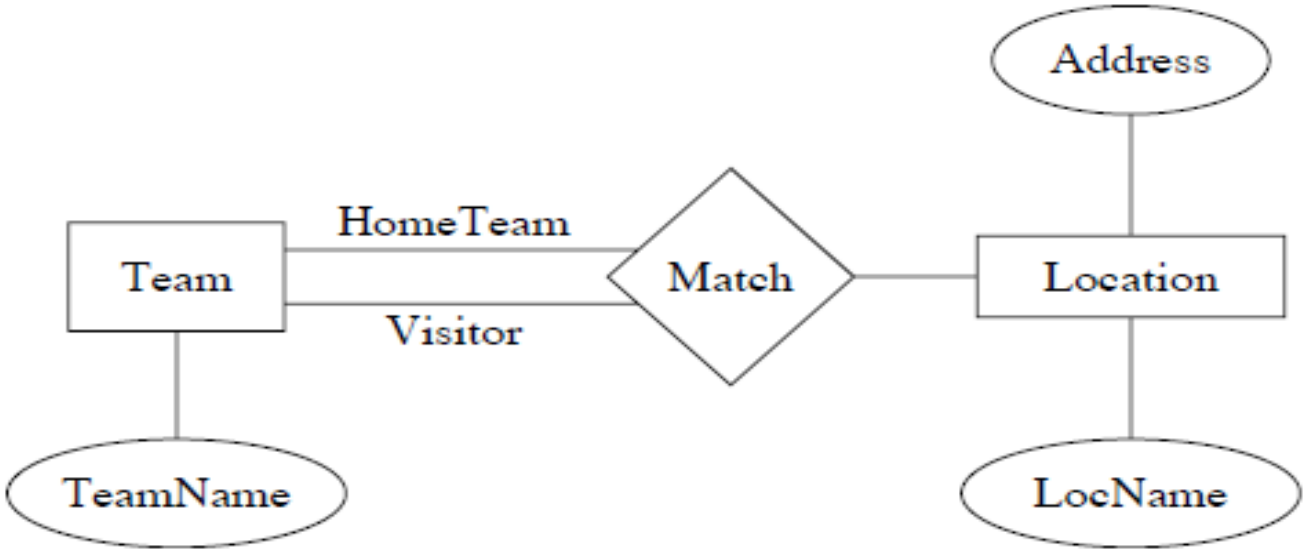
Relational Model
Part Two

Database Management - CIS 386 01 FA17

By: Dr. Aos Mulahuwaish

Multiple Relationships and Role Names

- Role: the function of an entity set in a relationship set
- Role Name: an explicit indication of a role
  - Role labels are needed whenever an entity set has multiple functions in a relationship set.
  - Example:



Identifying Subordinate Entities

- Weak Entity Set: an entity set containing subordinate entities.
- Strong Entity Set: an entity set containing no subordinate entities.
  - Attributes of weak entity sets only form key relative to a given dominant entity.

Specialization and Generalization

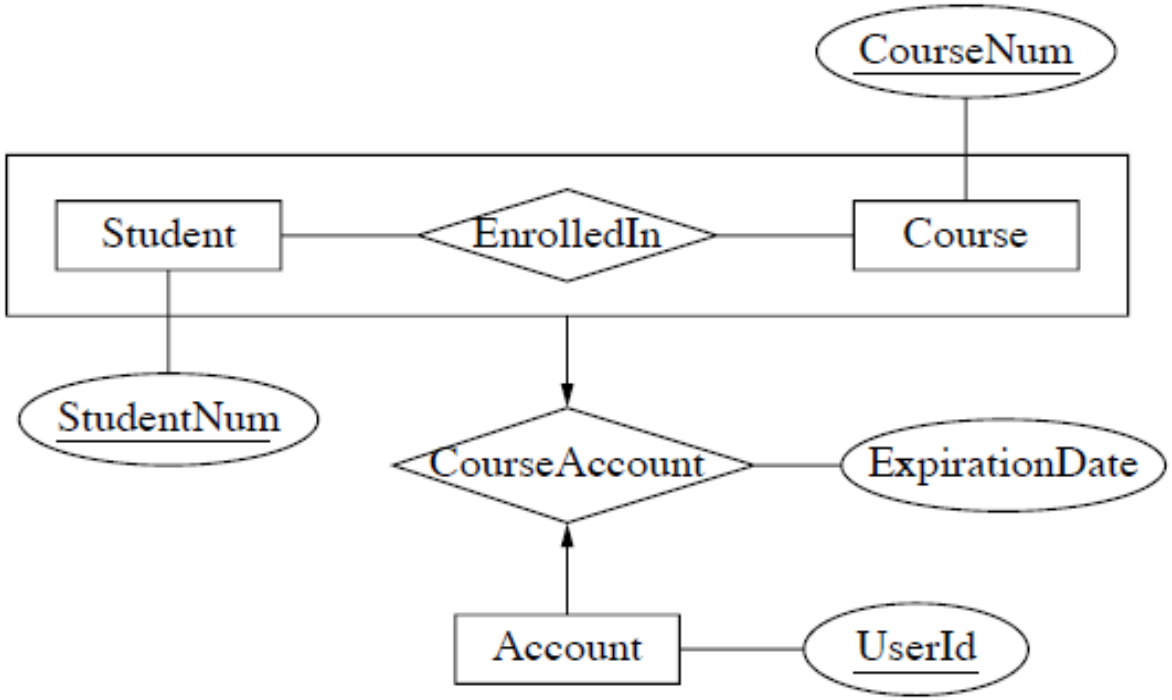
- The ER Model has the power of expressing database entities in a conceptual hierarchical manner. As the hierarchy goes up, it generalizes the view of entities, and as we go deep in the hierarchy, it gives us the detail of every entity included.

  - Specialization: A specialized kind of entity set may be derived from a given entity set.

  - Generalization: Several entity sets can be abstracted by a more general entity set.

Aggregation

- Aggregation: Relationships can be viewed as higher-level entities.
  - Example: “Accounts are assigned to a given student enrollment.”

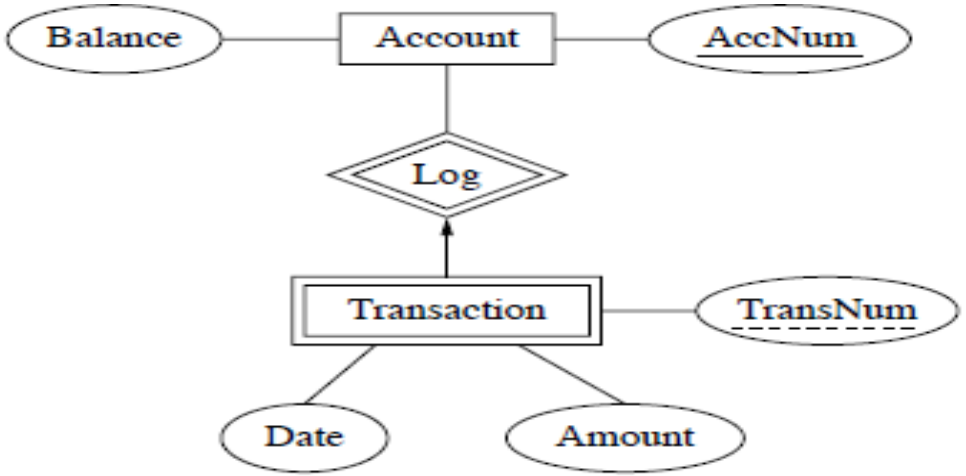


E-R Diagram Existence Dependencies

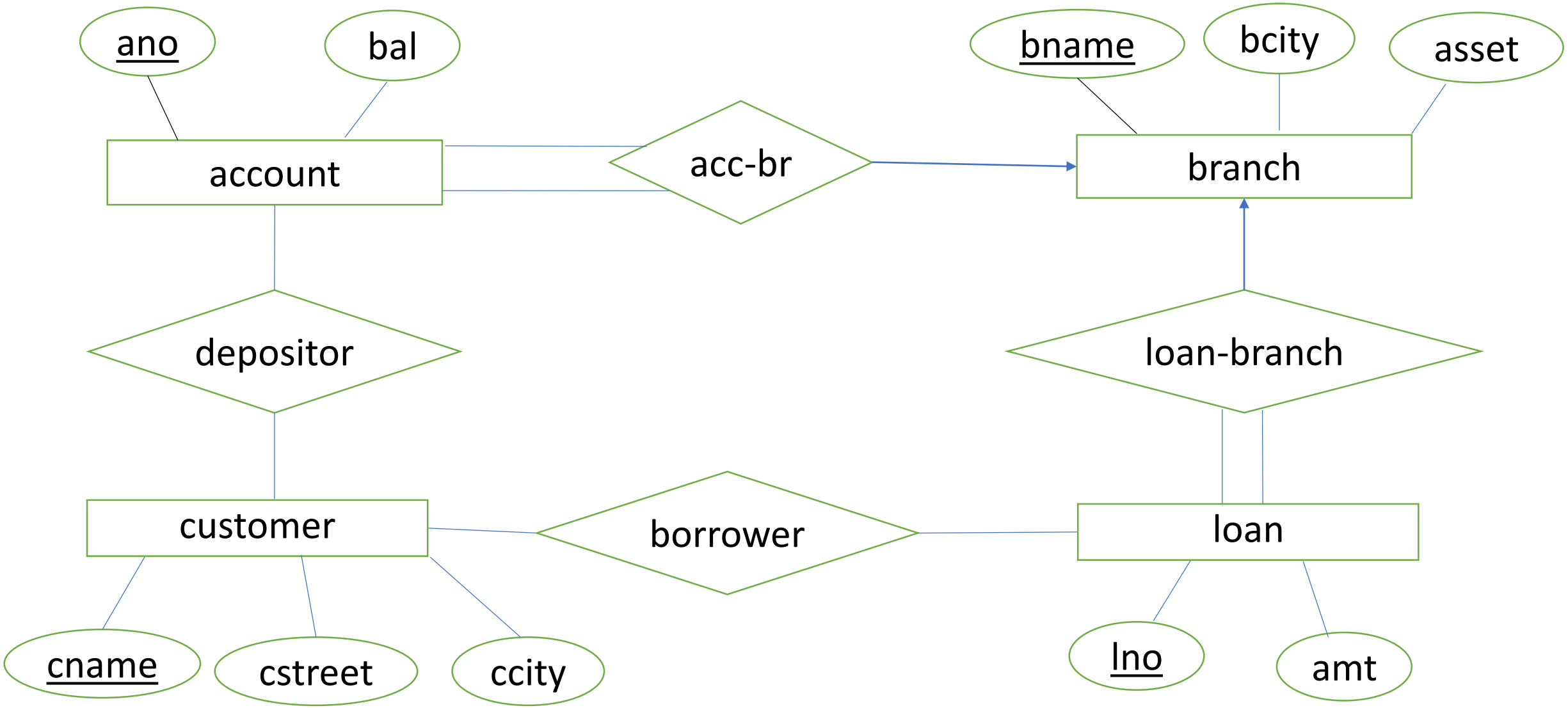
- Sometimes the existence of an entity depends on the existence of another.
  - If x is existence dependent on y, then:
    - y is a dominant entity
    - x is a subordinate entity

https://cs.uwaterloo.ca/~tozsu/courses/CS348/F12/notes.shtm

- Example: "Transactions are existence dependent on accounts."



Case Study Banking System



Integrity Constraints

- **Null**
  - Represents value for an attribute that is currently unknown or not applicable for tuple.
  - Deals with incomplete or exceptional data.
  - Represents the absence of a value and is not the same as zero or spaces, which are values.
- **Entity Integrity**
  - In a base relation, no attribute of a primary key can be null.
- **Referential Integrity**
  - If foreign key exists in a relation, either foreign key value must match a candidate key value of some tuple in its home relation or foreign key value must be wholly null.
- **General Constraints**
  - Additional rules specified by users or database administrators that define or constrain some aspect of the enterprise.