Business School
UNIVERSITY OF COLORADO DENVER

Information Systems Program

Module 7
ERD Rules and Problem Solving

Lesson 1: Basic Diagram Rules

Lesson Objectives

- Apply completeness diagram rules to avoid obvious omissions
- Explain limitations of diagram rules

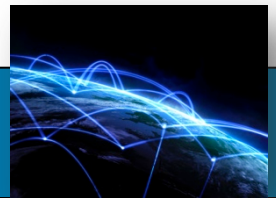
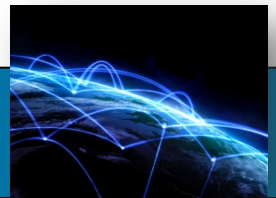


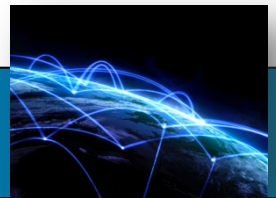
Diagram Rules

- Ensure that ERD notation is correctly used
- Similar to syntax rules for a computer language
- Completeness rules: no missing specifications

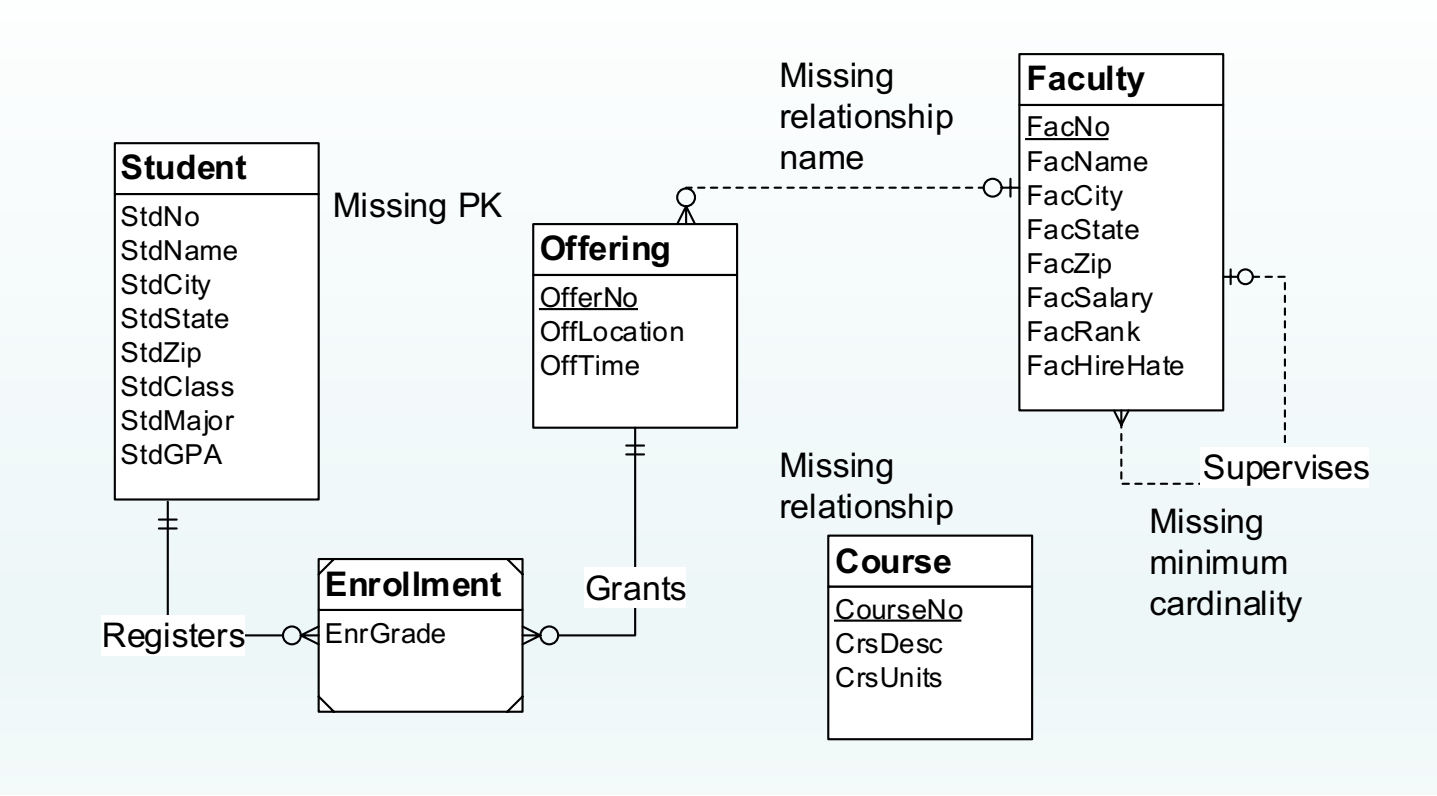


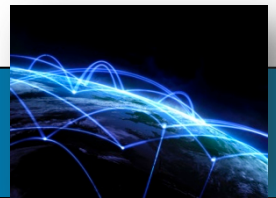
Completeness Rules

- Primary Key Rule: all entity types have a PK (direct or indirect)
- Naming Rule: all entity types, relationships, and attributes have a name
- Cardinality Rule: cardinality is specified in both directions for each relationship
- Entity Participation Rule: all entity types participate in an at least one relationship



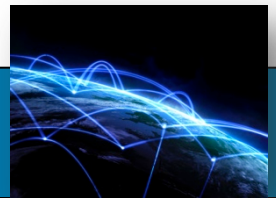
Completeness Rule Violations





Primary Key Rule Issue

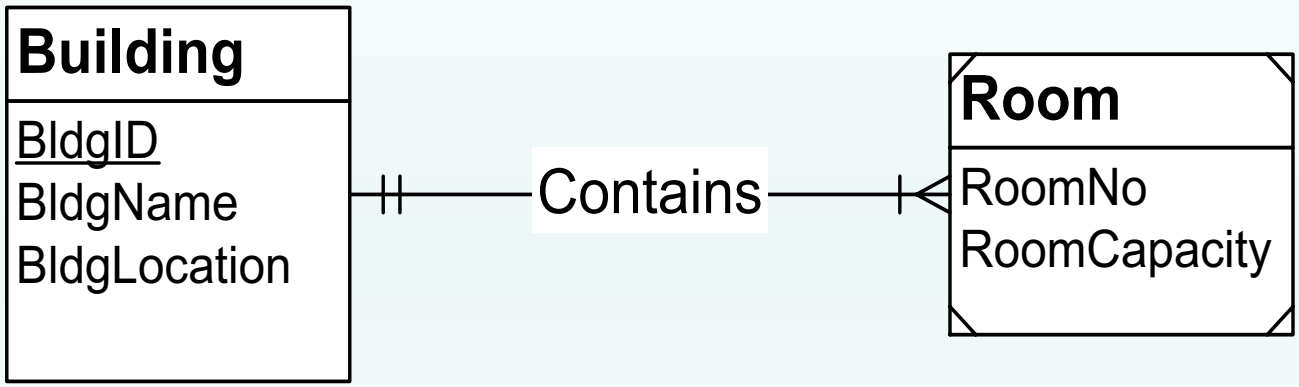
- Primary key rule is simple in most cases
- For some weak entity types, the PK rule is subtle
  - Weak entity type with only one 1-M identifying relationship
  - Weak entity type must have a local key to augment the borrowed PK from the parent entity type
  - Violation of PK rule if local key is missing

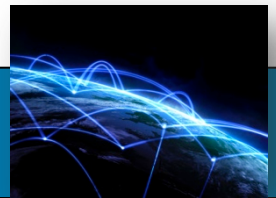


PK Rule Violation Example

PK rule violation

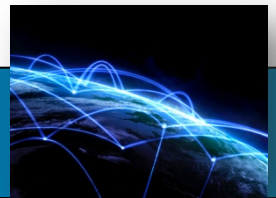
- A single 1-M identifying relationship
- Room does not have a local key.





Naming Consistency Rules

- Entity Name Rule: entity type names must be unique
- Attribute Name Rule: attribute names must be unique within each entity type and relationship



Summary

- Use the diagram rules to ensure structural consistency and completeness
- Completeness easy to check