

Converting Multiway to Binary

- It is easy to convert a multiway relationship to multiple binary relationships
 - Create a new ***connecting entity set***. Think of its entities as the tuples in the relationship set for the multiway relationship
 - Introduce many-one relationships from the connecting entity set to each of the entities in the original relationship
 - If an entity set plays > 1 role, create a relationship for each role

Try this

- Partners or triples.
- Design an E/R diagram for a bank, including info about customers and accounts.
- Customer info: name, addr, phone, SSN.
- Account info: type (checking/savings), balance.
- Accounts may have multiple customers; customers may have multiple accounts.

Try this

- What if an account can have only one customer?
- What if a customer can have only one account?
- What if a customer can have multiple addresses and multiple phones?
- (Think pre-cell-phones) What if we want to associate phones with addresses?

Good design principles

- Faithfulness

- Entity sets & attributes should reflect reality in choice of attributes and multiplicity of relationships.
- The real-world situation can dictate what faithfulness means.
- E/R diagram cannot convey all the information.
- Consider Students/Courses/Profs & multiplicity – can be different ways to do this diagram.

Good design principles

- Avoid redundancy
 - Beware of one-one relationships where each entity set is not connected to anything else.
- Choosing the right relationships
 - Does every relationship express all the information you need it to express?

Good design principles

- Picking an attribute or entity set
- Replace E by an attribute when
 - All relationships involving E must have arrows entering E.
 - If E has >1 attribute, then no attribute depends on any other attribute.
 - No relationship involves E more than once.

Keys in E/R diagrams

- Underline primary key attributes for each entity set.
- Possible for an entity set's key attributes to belong to another entity set in certain situations.
 - isa hierarchies
 - weak entity sets (later)

Referential integrity in E/R

- Enforced through multiplicity arrows
- Degree constraints can be added to further restrict multiplicity.

Try US Congress handout

- The US Congress is composed of the House of Representatives and the Senate.