Database Design

5-1: Relationship Transferability

Vocabulary

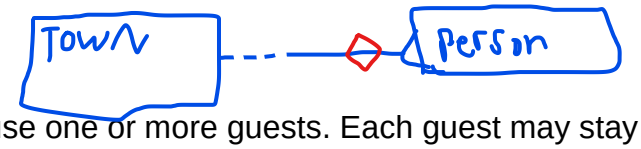
Identify the vocabulary word for each definition below.

transferable	Description of a relationship where an instance of A is related to an instance of B, and the association can be moved to another instance of B.
non-transferable	Description of a relationship where an instance of A is related to an instance of B, and the association cannot be moved to another instance of B

Try It / Solve It

1. Draw ERDs for each of the following. Draw softboxes, relationship lines, and labels for each relationship in both directions. Indicate non-transferability when appropriate.

- Each town may be the birthplace of many people. Each person must be born in one and only one town.



Non-transferable

- Each room may house one or more guests. Each guest may stay in one and only one room.

Transferable

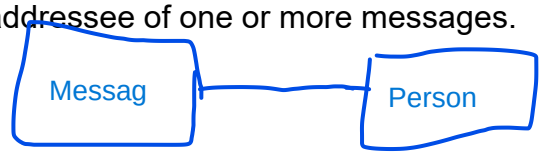
- Each employee must work for one and only one department. Each department may have one or more employees.

Transferable

- Each hotel may be the host of one or more guests. Each guest may be hosted in one or more hotels.

Transferable

- Each message must be addressed to one or more persons. Each person may be the addressee of one or more messages.



Transferable

Database Design

5-2: Relationship Types

Vocabulary

Identify the vocabulary word for each definition below.

one-to-one relationship	A relationship where each record in Table A can be related to one, and only one, record in Table B, and each record in Table B relates to one, and only one, record in Table A.
one-to-many relationship	A relationship where a single record in Table A can be related to one or more records in Table B, but a single record in Table B can only be related to one record in Table A.
many-to-many relationship	A relationship in which many records in one table match many records in another table
redundant data	Unnecessarily repetitive

Try It / Solve It

1. Identify the relationship types of the statements below

Type	Statement
one-to-many	A snowboard instructor may instruct one or more snowboard-ers
one-to-one	A bicycle may be owned by a child
one-to-many	Classroom crayons may be used by students in a classroom
one-to-one	A passport belongs to a person
one-to-many	A female elephant gives birth to an elephant

2. Provide an example for each relationship type.

Relationship Type	Example
One-to-one	A person has one passport, and each passport belongs to one person
One-to-one	A car has one license plate, and each license plate is assigned to one car
One-to-many	A teacher teaches many students, but each student has only one homeroom teacher
One-to-many	A mother can have many children, but each child has only one biological mother
Many-to-many	Students enroll in multiple courses, and each course has multiple students
Many-to-many	Authors write multiple books, and each book can have multiple authors

Database Design

5-3: Resolving Many-to-Many Relationships

Practice Activities

Objectives

- Identify attributes which belong to many-to-many relationships
- Demonstrate the steps to resolve a many-to-many relationship using an intersection entity
- Identify the UID of an intersection entity and represent it in the entity relationship diagram

Vocabulary

Identify the vocabulary word for each definition below.

participating attribute	A relationship that participates in an entity's unique identifier.
intersection entity	The product of the resolution of a many to many relationship.

Try It / Solve It

1. Resolve the M:M between CUSTOMER and PRODUCT. Customers can purchase various products, and products can be purchased by many customers. Draw ERD.

Database Design

5-4: Understanding CRUD Requirements

Practice Activities

Objectives

- Create ER models that reflect all business rules gathered during the interview process
- Identify the create, retrieve, update, and delete (CRUD) requirements of the business
- Validate your ER model by performing a CRUD analysis

Vocabulary

Identify the vocabulary word for each definition below.

consultant	One who gives expert or professional advice
CRUD	The practice of checking a data model for create, retrieve, update and delete functions that the business requires
functions	Used to perform calculations on data, modify individual data items, manipulate output for groups of rows, format dates and numbers for display, convert column datatypes.

Try It / Solve It

1. Identify the part of the CRUD analysis that best suits the task in the table.

   - Create
   - Retrieve
   - Update
   - Delete

Alter	Update
Bring up	Retrieve
Change	Update
Discard	Delete
Enter	Delete
Find	Retrieve
Import	Delete
Input	Delete
Load	Retrieve
Look up	Retrieve
Modify	Update
Print	Delete
Purge	Delete
Read	Retrieve
Record	Delete
Remove	Delete
Report	Retrieve
Trash	Delete
View	Retrieve

2. Relate CRUD analysis to a school enrollment environment. Consider the data or infor-mation used in a school and identify at least one example for each CRUD function. If it helps, use PowerSchool as the example.

   a. Create:

      entering a new student into the system when they enroll (adding their name, ID, classes, n stuff)

   b. Retrieve:

      looking up a student's grades or schedule in the system

   c. Update:

      changing a student's address, phone number, or updating grades after an assignment

   d. Delete:

      removing a student record if they transfer out or deleting a dropped class from their schedule