

# Relationship Types and Relationship Sets in DBMS

## Relationship


- ⌘ The association among entities is called a relationship. For example, an employee **works\_at** a department, a student **enrolls** in a course. Here, Works\_at and Enrolls are called relationships.

## Relationship Set

- ⌘ A set of relationships of similar type is called a relationship set. Like entities, a relationship too can have attributes. These attributes are called **descriptive attributes**.

# Types of Relationship (Degree of Relationship)

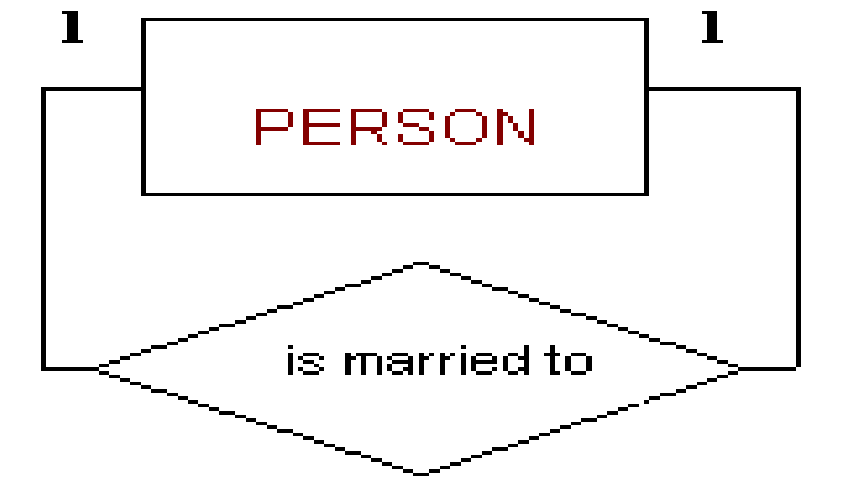
Following types or degrees of relationship may exist among the various entities:-

- ⌘ Unary Relationship (Degree 1)
  - ⌘ Binary relationship (Degree 2)
  - ⌘ Ternary Relationship (Degree 3)
  - ⌘ N-ary Relationship (Degree n)
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# Unary Relationship

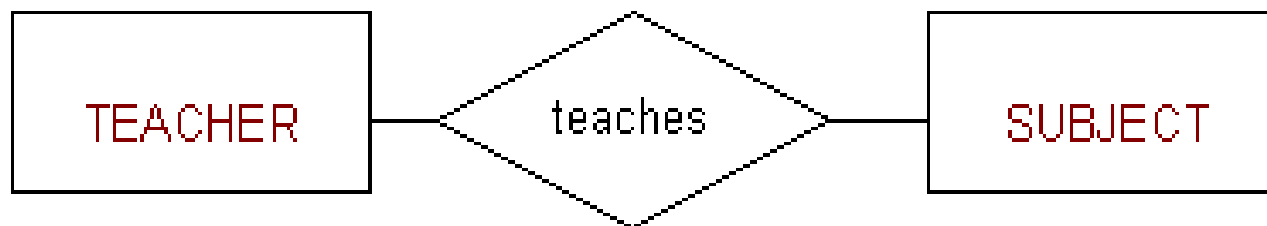
- ❑ In Unary Relationship, an ENTITY TYPE is linked with itself.
- ❑ It is also called recursive relationship.

- ❑ **Example:**



# Binary relationship

- ⌘ A Binary relationship is the one that links two entity sets e.g. STUDENT-CLASS.
- ⌘ Relationships can be formally described in an ordered pair form like  $R(x,y)$ .
- ⌘ For example:

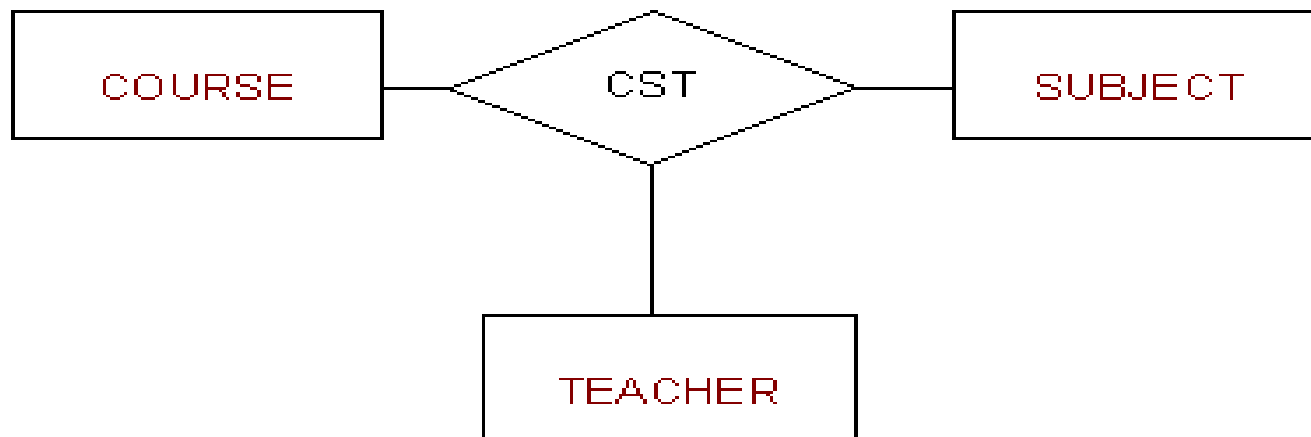


# Ternary Relationship

⌘ A Ternary relationship is the one that involves three entities

⌘ ***For Example:***

The University might need to record which teachers taught which subjects in which courses.



# N-ary Relationship

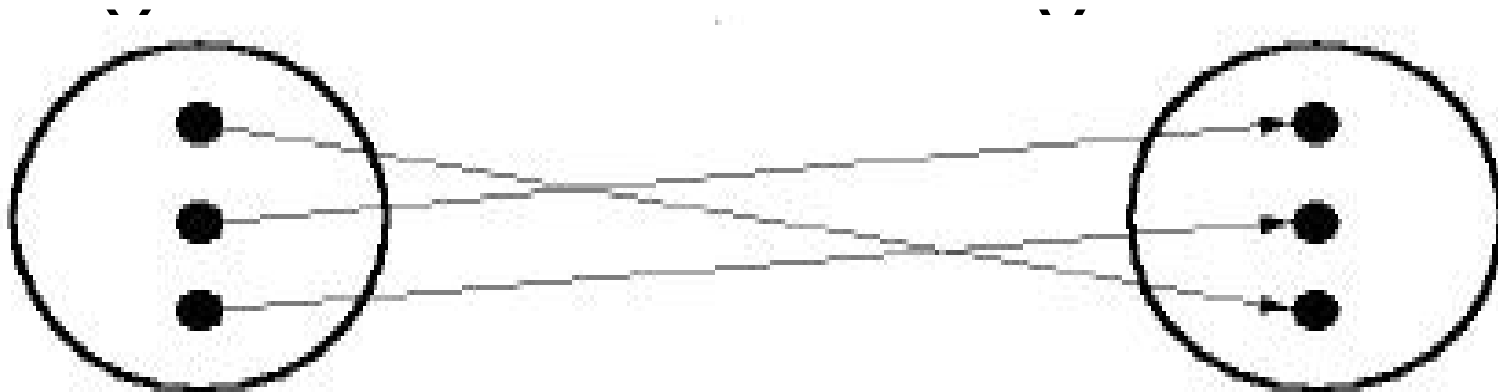
- ⌘ Most relationships in data model are binary or at most ternary but we could define a relationship set linking any number of entity sets i.e. n-ary relationship.

# Relationship Cardinalities

- ⌘ The cardinality of a relationship is the number of entities to which another entity can map under that relationship.
- ⌘ Four types of Relationship Cardinalities may exist such as:
  - ⌘ *One-to-One mapping*
  - ⌘ *Many-to-One mapping*
  - ⌘ *One-to-Many mapping*
  - ⌘ *Many-to-Many mapping*

# One-to-One mapping

A mapping  $R$  from  $X$  to  $Y$  is one-to-one if each entity in  $X$  is associated with at most one entity in  $Y$  and vice versa.



**(a) One-to-One Mapping**



# Many-to-One mapping

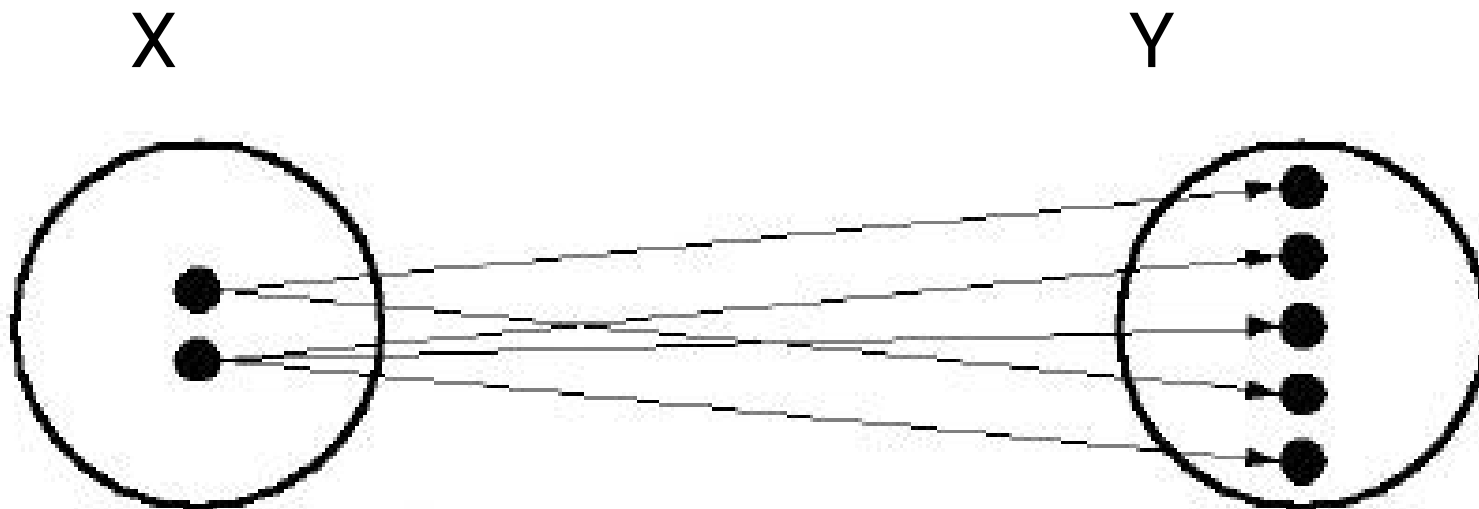
A mapping  $R$  from  $X$  to  $Y$  is many-to-one if each entity in  $X$  is associated with at most one entity in  $Y$  but at least one entity in  $Y$  is associated with many entities in  $X$ .



(a) Many-to-One Mapping

# One-to-Many mapping

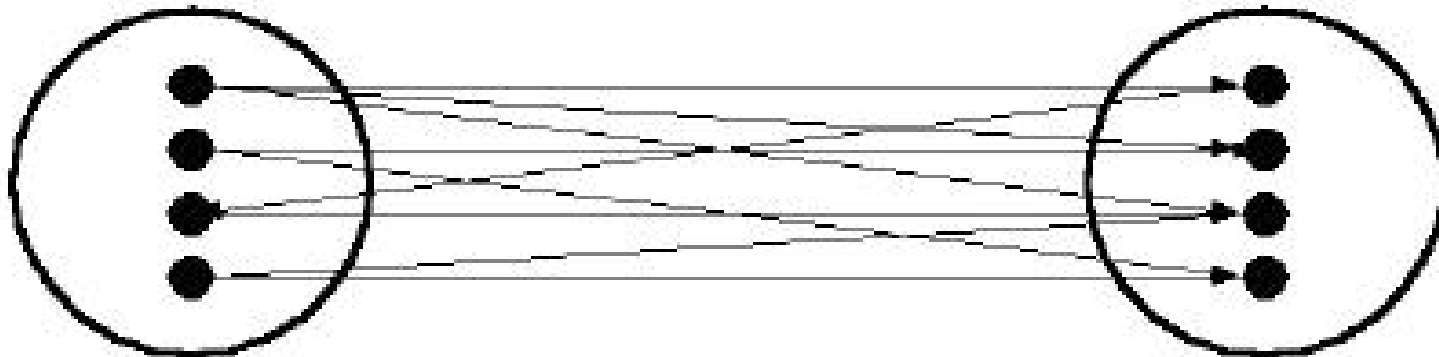
A mapping  $R$  from  $X$  to  $Y$  is one-to-many if each entity in  $X$  is associated with many entities in  $Y$  but each entity in  $Y$  is associated with one entity in  $X$ .



(c) One-to-Many Mapping







# Many-to-Many mapping

A mapping  $R$  from  $X$  to  $Y$  is many-to-many if each entity from  $X$  is associated with many entities in  $Y$  and one entity in  $Y$  is associated with many entities in  $X$ .



(d) Many-to-Many Mapping

# ERD Notation

	One
	Many
	One (and only one)
	Zero or one
	One or many
	Zero or many

# EXAMPLE

