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Database Design

5-3
Resolving Many-to-Many Relationships

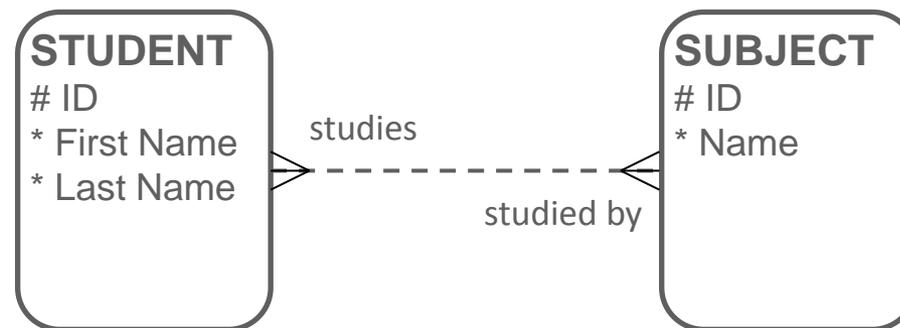# Objectives

This lesson covers the following 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

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Purpose

- This lesson will help you complete your model - you may need to create new entities or new relationships based on the business needs.

- It will also help you define the scope of your data model - you only model what is of importance to the business.
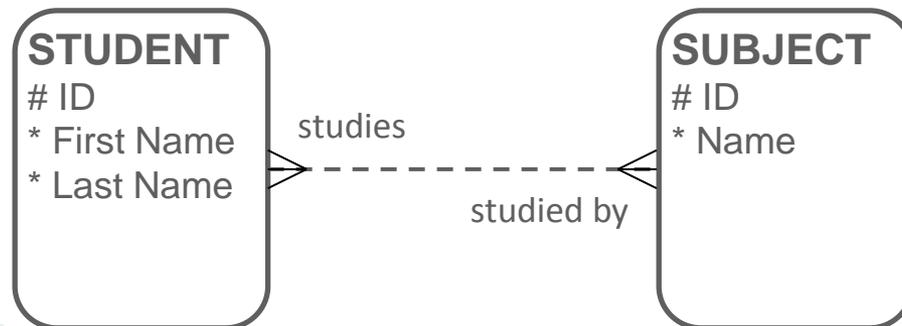
Relationship Hiding an Attribute

- In a school, a STUDENT may study one or more SUBJECTs.
- Each SUBJECT may be studied by one or more STUDENTs

STUDENT
ID
* First Name
* Last Name

studies

studied by

SUBJECT
ID
* Name

STUDENT and SUBJECT

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Relationship Hiding an Attribute

- When a student enrolls for a subject, we want to be able to record the grade they attain for that subject.

- Which entity would the attribute "Grade" belong to?

- If we put "Grade" in the STUDENT entity, how would we know which SUBJECT it is for?

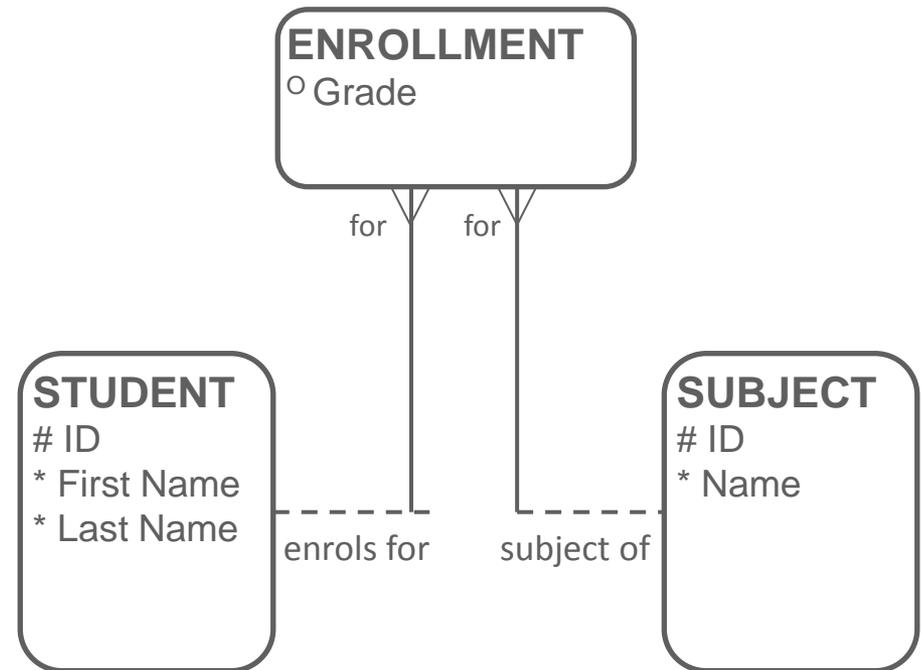- If we put "Grade" in the SUBJECT entity, how would we know which STUDENT got that grade?

STUDENT
\# ID
* First Name
* Last Name

studies

studied by

SUBJECT
\# ID
* Name

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Resolution of a M:M Relationship

- A third entity is needed to resolve the M:M relationship. This is called an "intersection" entity.
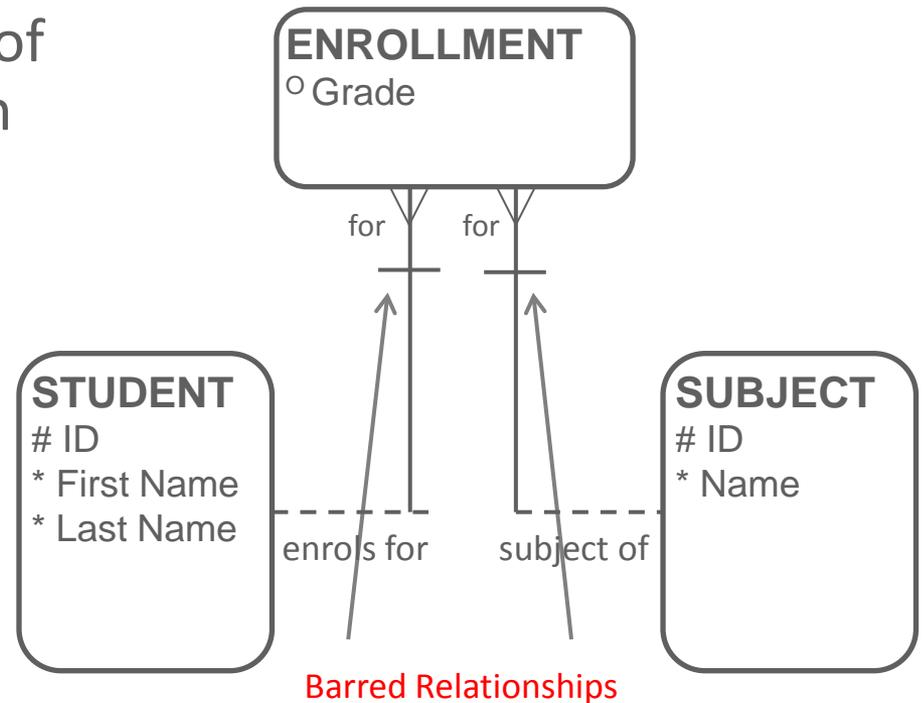
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Intersection Entity

- An intersection entity – ENROLLMENT – has been added, including the "Grade" attribute.

- The original M:M relationship has become two 1:M relationships.

- What would be the UID of the intersection entity?

ENROLLMENT
O Grade

for   for

STUDENT
ID
* First Name
* Last Name

enrols for   subject of
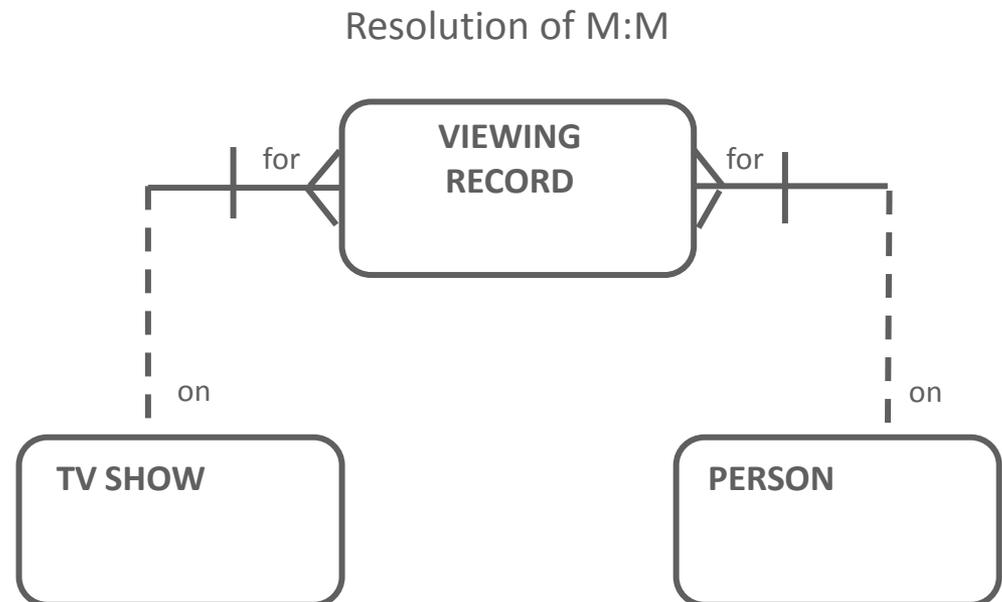
SUBJECT
ID
* Name

Barred Relationships

- The unique identifier (UID) of the intersection entity often comes from the originating relationships and is represented by the bars.

- In this case, the relationships from the originating entities to the intersection entity are called "barred" relationships.
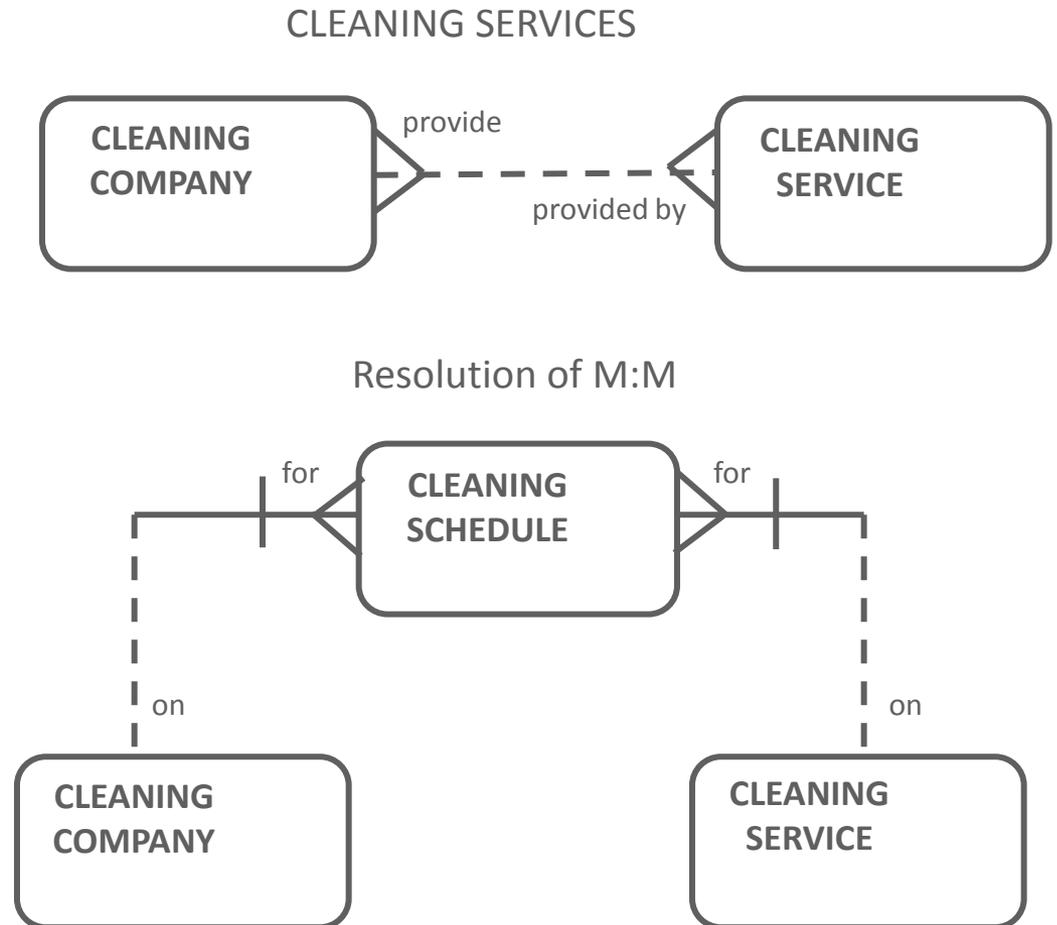
ENROLLMENT
O Grade

for   for

STUDENT
ID
* First Name
* Last Name

enrols for   subject of

SUBJECT
ID
* Name

Barred Relationships

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M:M Resolution Example TV Shows

- Each TV show may be watched by one or more persons.

- Each person may watch one or more TV shows.

TV SHOW

| TV SHOW | watched by | PERSON |

watch

Resolution of M:M

VIEWING RECORD

for   for

TV SHOW   on   on   PERSON

M:M Resolution Example Cleaning Services

- Each company may provide one or more cleaning services.

- Each cleaning service may be provided by one or more companies.

CLEANING SERVICES

Resolution of M:M

Terminology

Key terms used in this lesson included:

- Barred relationship
- Intersection entity

Summary

In this lesson, you should have learned how to:

- 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