



# ORACLE

## Academy



# Database Design

6-1

**Artificial, Composite, and Secondary UIDs**

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# Objectives

- This lesson covers the following objectives:
  - Define the different types of unique identifiers (UIDs)
  - Define a candidate UID and explain why an entity can sometimes have more than one candidate UID
  - Analyze business rules and choose the most suitable primary UID from the candidates
  - Recognize and discuss the issues of identification in the real world

# Purpose

- The unique identifier (UID) is very important in relational databases
- It is the value or combination of values that enables the user to find that one unique item among all the rest
- Identifying just the right attribute, or combination of attributes and relationships, is a skill that any database designer must master
- The unique identifier enables you to find your record in a file, a particular card in a deck of cards, your package in a warehouse, or a specific piece of data in a database

# Simple UID vs. Composite UIDs

- A UID that is a single attribute is a simple UID
- However, sometimes a single attribute is not enough to uniquely identify an instance of an entity
- If the UID is a combination of attributes, it is called a composite UID

## CONCERT TICKET

# Ticket number

\* Name

**Simple Unique  
Identifier**

## CONCERT TICKET

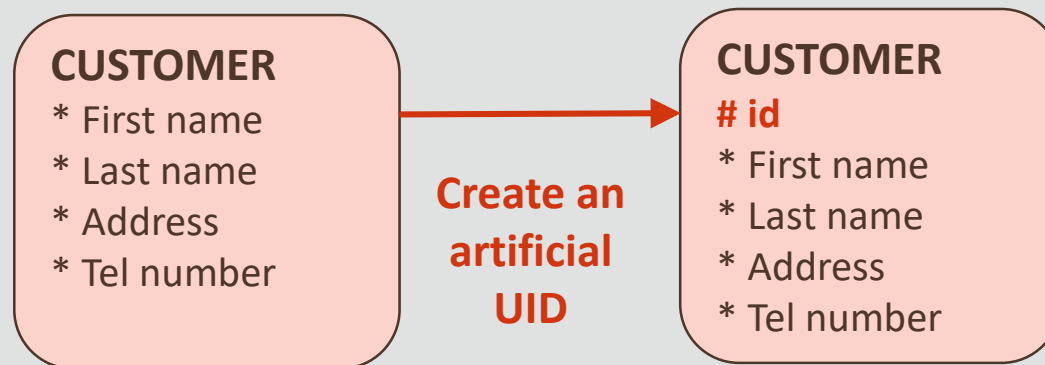
# Date of performance

# Seat number

**Composite Unique  
Identifier**

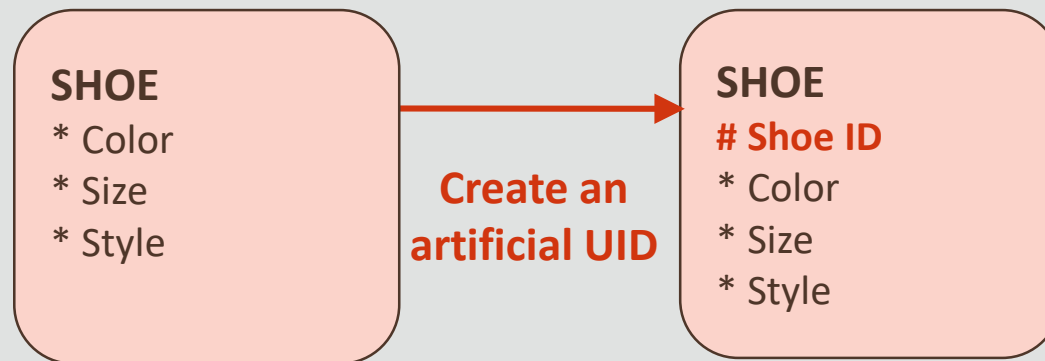
# Artificial UUIDs

- Artificial UUIDs are those that don't occur in the natural world but are created for purposes of identification in a system
- People are not born with "numbers," but a lot of systems assign unique numbers to identify people: student numbers, customer IDs, etc



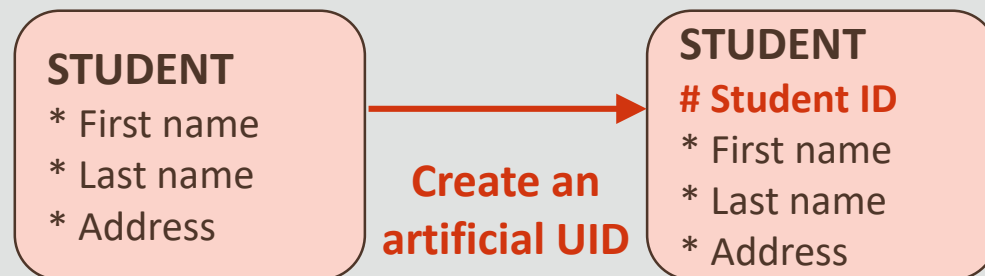
# Artificial UUIDs

- A shoe has a color, a size, a style, but no truly descriptive “number”
- However, a shoe store will assign unique numbers to each pair of shoes so they can be uniquely identified



# Artificial UID Example

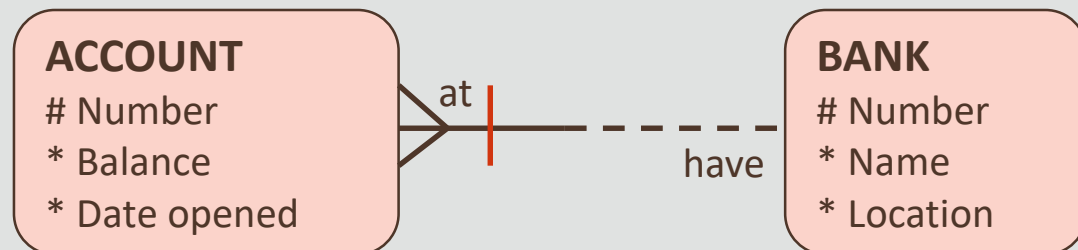
- How can we uniquely identify a STUDENT?
- Could we use a combination of first name and last name?
  - Only if we are sure that the combination is unique
- Often, it is simpler and more straightforward to create an artificial attribute and make it the unique identifier
- A UID can be both artificial and composite





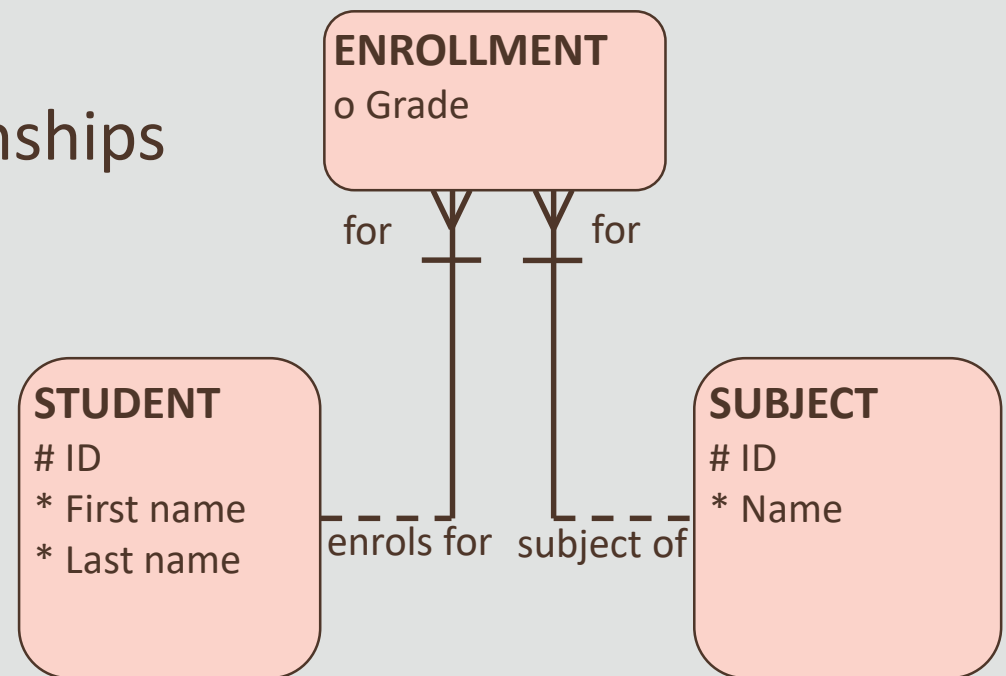
# UIDs from Barred Relationships

- Sometimes the UID is a combination of an attribute and a relationship
- What is the UID of ACCOUNT? Is it artificial? Is it composite?
- Two people could have the same bank account number, but at different banks
- Bank to bank transfers always need the bank routing number in addition to the bank account number



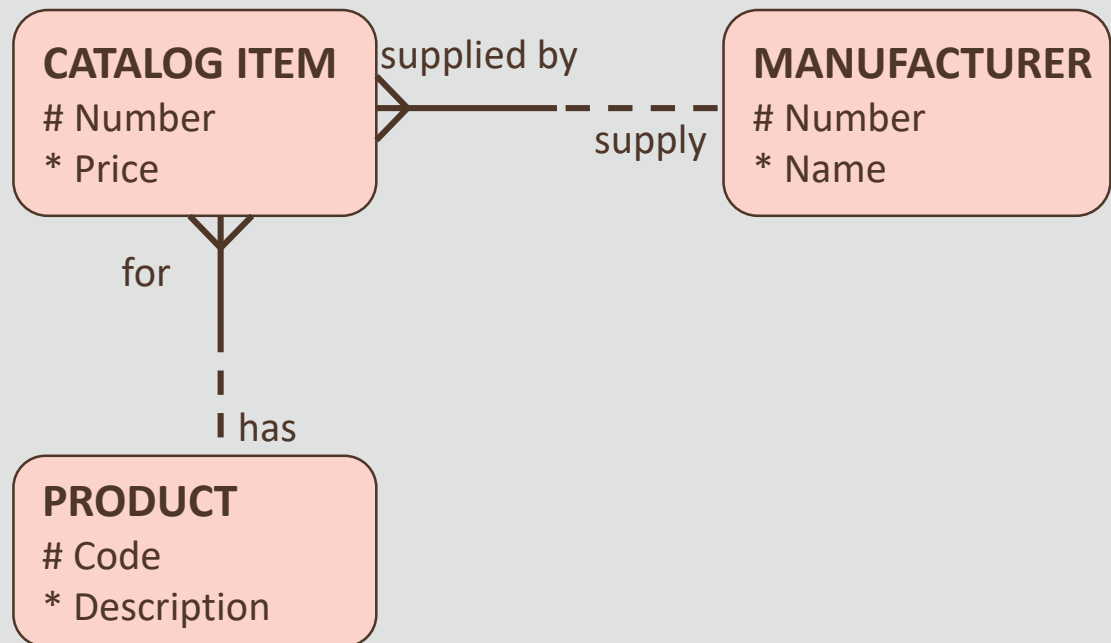
# UID from Barred Relationship Intersection Entity

- As we've seen before, the resolution of a M:M relationship often results in barred relationships from the intersection entity to the original ones
- In this example, the UID of ENROLLMENT comes from STUDENT and SUBJECT
- The bars on the relationships tell you this



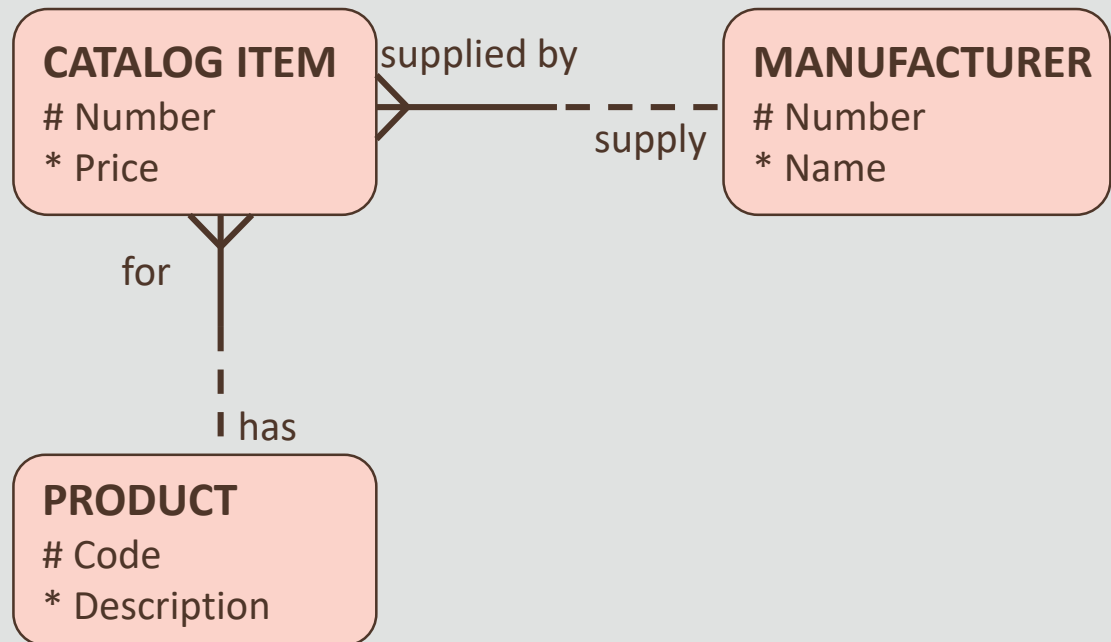
# Artificial UID Intersection Entity

- It is possible for an intersection entity to use an artificial attribute as the UID, instead of the barred relationships to the originating entities



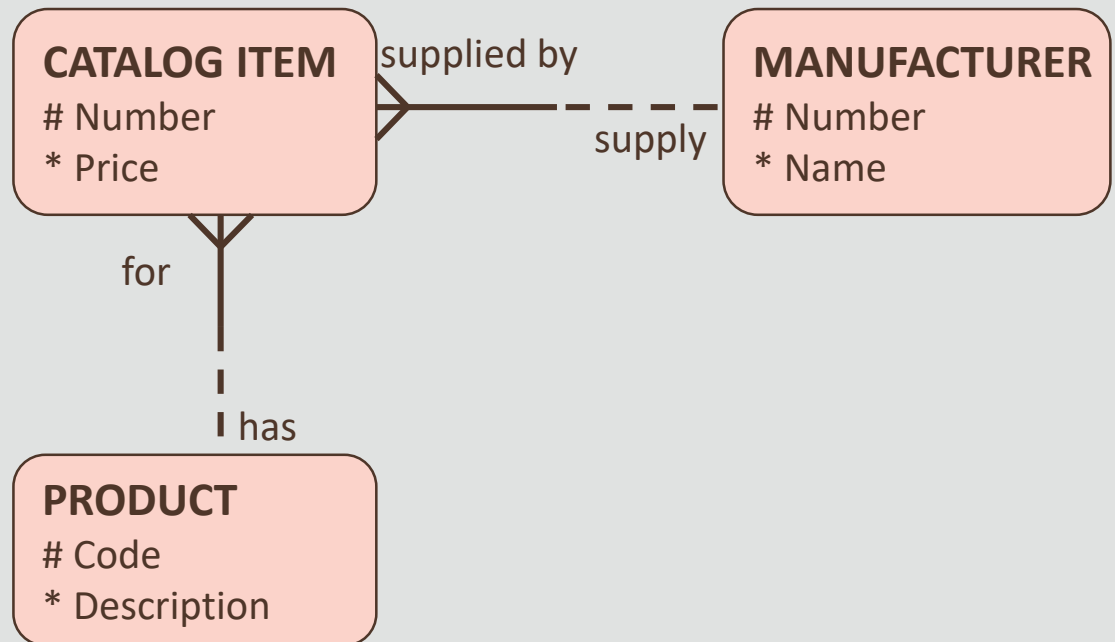
# Artificial UID Intersection Entity

- Each MANUFACTURER may produce one or more PRODUCTS (shoes, shirts, jeans, etc.)
- Each PRODUCT may be produced by one or more MANUFACTURERS (Nike shoes, Adidas shoes, Levi's jeans, etc.)



# Artificial UID Intersection Entity

- CATALOG ITEM resolves this many-to-many relationship
- An item in a catalog can be uniquely identified by the manufacturer number and the product code
- The relationships are not barred, an artificial UID – catalog number – has been created instead



# Candidate UUIDs

- Sometimes two or more possible UUIDs exist
- For example, when you order a product from a commercial website, you will usually be assigned a unique customer code and asked to enter your e-mail address
- Each of these uniquely identifies you, and each could be chosen as the UUID
- These are both candidate UUIDs
- Only one of the candidate UUIDs is chosen as the actual UUID, this is called the primary UUID
- The other candidates are called secondary UUIDs

# Candidate UUIDs

- Student ID has been chosen as the primary UUID in both of these STUDENT entities
- The first entity has one secondary UUID, while the second has two secondary UUIDs (one of which is composite)

## STUDENT

# Student ID  
(#) Badge number  
\* First name  
\* Last name  
\* Address

**One Primary UUID**  
**One Secondary UUID**

## STUDENT

# Student ID  
(#1) Badge number  
(#2-1) First name  
(#2-2) Last name  
\* Address

**One Primary UUID**  
**Two Secondary UUIDs**

# Identification: Database vs. Real World

- Unique identifiers make it possible for us to distinguish one instance of an entity from another
- As you will see later, these become primary keys in the database
- A primary key allows you to access a specific record in a database
- In the real world, however, it is sometimes not so easy to distinguish one thing from another





# Terminology

- Key terms used in this lesson included:
  - Artificial UID
  - Candidate UID
  - Composite UID
  - Primary UID
  - Secondary UID
  - Simple UID
  - UID

# Summary

- In this lesson, you should have learned how to:
  - Define the different types of unique identifiers (UIDs)
  - Define a candidate UID and explain why an entity can sometimes have more than one candidate UID
  - Analyze business rules and choose the most suitable primary UID from the candidates
  - Recognize and discuss the issues of identification in the real world



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