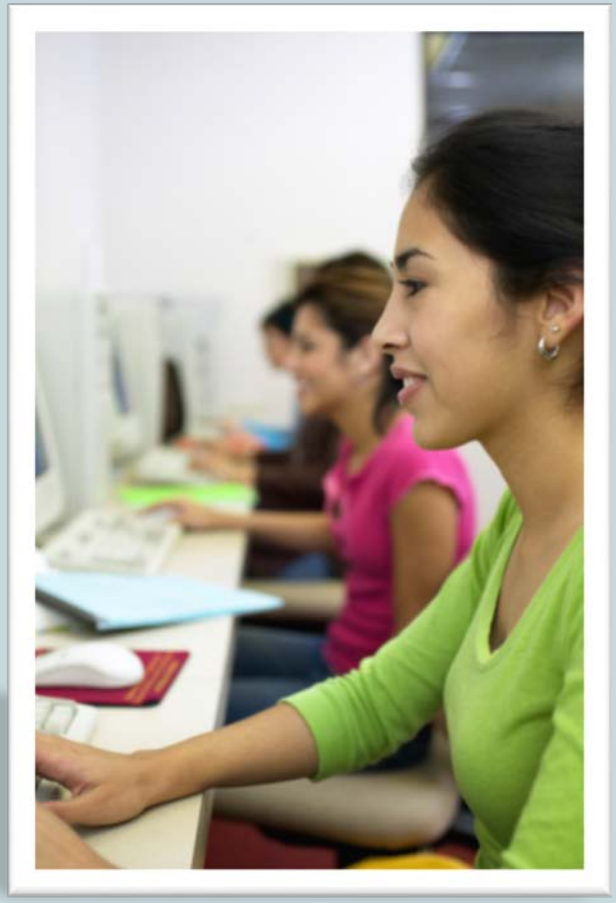

ORACLE
Academy

Database Design

3-1
Identifying Relationships



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Objectives

This lesson covers the following objectives:

- Interpret and describe relationship optionality
- Interpret and describe relationship cardinality
- Relate (connect or join) entities by applying the rules of cardinality and optionality

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Purpose

- Being able to identify the relationships between entities makes it easier to understand the connections between different pieces of data.
- Relationships help you see how different parts of a system affect each other.
- For example, the entities STUDENT and COURSE are related to each other.
- To accurately model the business, the relationships between entities are as important as the entities themselves.

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Relationships in Families

- A relationship is the way in which two or more people or things are connected.
- Family relationships categorize relationships between people, for example mother, father, aunt and cousin.
- The name of the relationship tells us how the family members are connected.

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Relationships in Data Models

Relationships:

- Represent something of significance or importance to the business
- Show how entities are related to each other
- Exist only between entities (or one entity and itself)
- Are bi-directional
- Are named at both ends
- Have optionality
- Have cardinality

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What is Optionality in a Relationship?

- Relationships are either mandatory or optional.
- Consider the two entities EMPLOYEE and JOB.
- Based on what you know about instances of the entities, you can determine optionality by answering two questions:
- Must every employee have a job?
  - In other words, is this a mandatory or optional relationship for an employee?
- Must every job be assigned to an employee?
  - In other words, is this a mandatory or optional relationship for a job?

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What is Cardinality in a Relationship?

- Cardinality measures the quantity of something.
- In a relationship, it determines the degree to which one entity is related to another by answering the question, “How many?”
- For example:
  - How many jobs can one employee hold? One job only? Or more than one job?
  - How many employees can hold one specific job? One employee only? Or more than one employee?
    - Note: The cardinality of a relationship only answers whether the number is singular or plural; it does not answer with a specific plural number.

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Optionality and Cardinality

Examples:

- Each EMPLOYEE must hold one and only one JOB
- Each JOB may be held by one or more EMPLOYEEs
- Each PRODUCT must be classified by one and only one PRODUCT TYPE
- Each PRODUCT TYPE may classify one or more PRODUCTs

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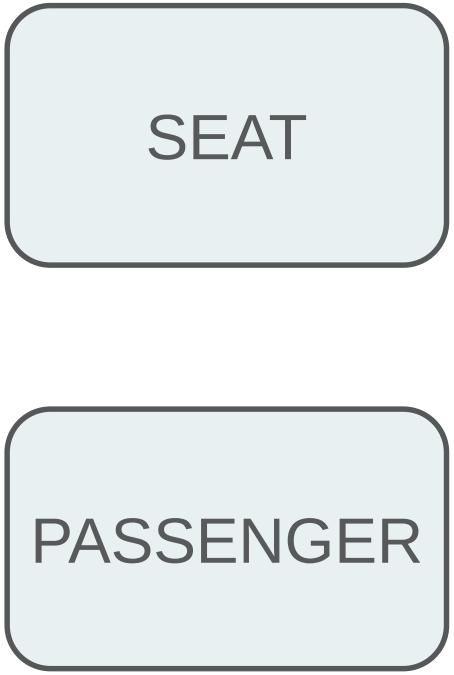
Relationships

- Each SEAT may be sold to one or more PASSENGERs
- Each PASSENGER may purchase one SEAT
- SEAT is sold to a PASSENGER (or PASSENGERs -- hence, overbooking)
- PASSENGER purchases or books a SEAT



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Business Scenario 1

- What are the relationships in the following business scenario?
- “In our restaurant, a customer walks up to the counter and places their order. A customer can order for him or herself only, or for him/herself and others. For example, a mother orders for herself and her children.
- We consider the mother to be the customer who owns the order and is responsible for payment. Over a period of time, a customer can place as many orders as he wants.”

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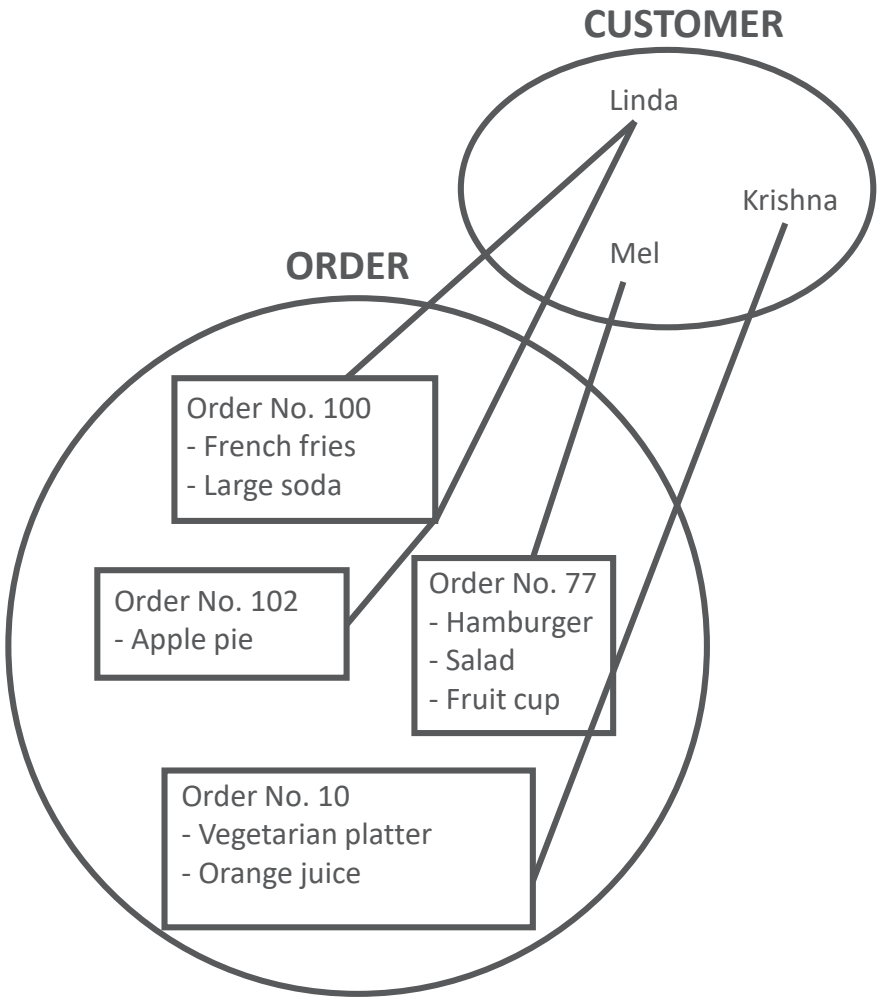
Business Scenario 1

- CUSTOMER places ORDERs: optionality and cardinality
- Optionality = Must or may?
- Each ORDER must be placed by one (and only one) CUSTOMER.
- Each CUSTOMER must place one or more ORDERs.



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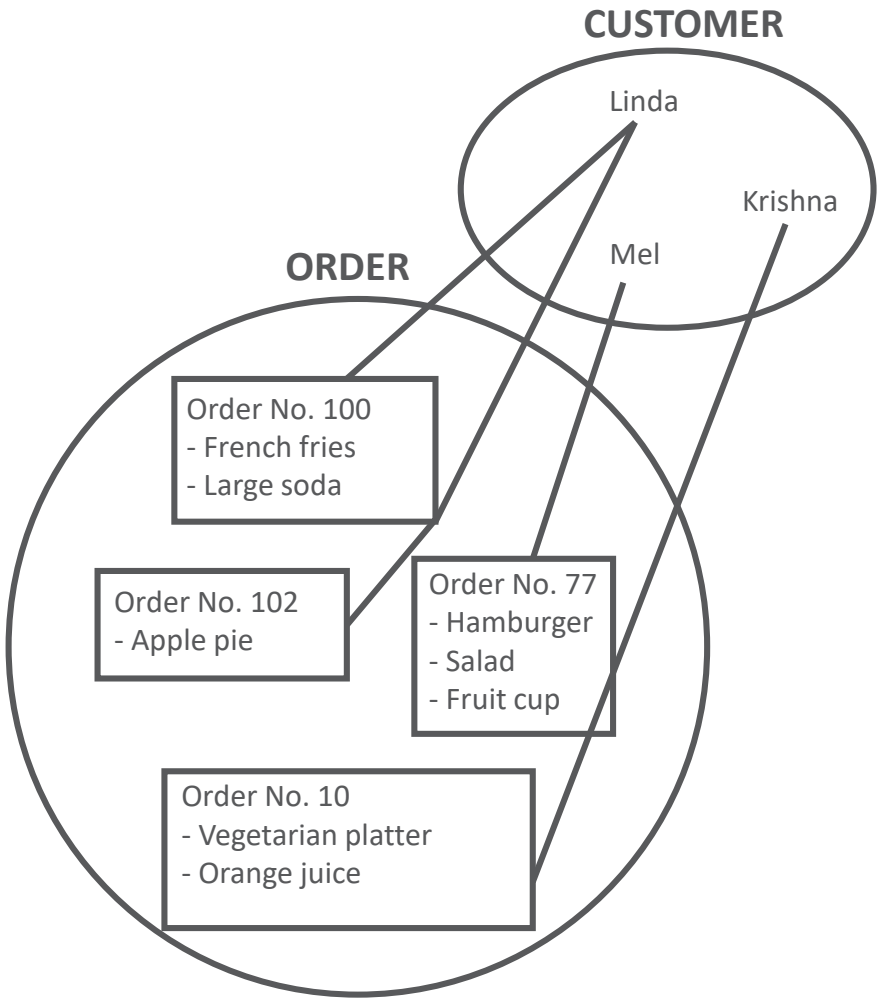
Business Scenario 1

- Cardinality = How many?
- Each ORDER must be placed by one and only one CUSTOMER.
- Each CUSTOMER must place one or more ORDERs.



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Business Scenario 2

- A relationship can join one entity to itself.
- Examine the following scenario:
  - "We need to keep track of our employees and their managers. Every employee has one manager, including the managing director who manages him/herself. Each manager can manage several employees."

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Business Scenario 2

- Since managers are also employees, both are listed in the same entity: EMPLOYEE.

RELATIONSHIP

Each **EMPLOYEE** may be managed by one and only one **EMPLOYEE**

Each **EMPLOYEE** may manage one or more **EMPLOYEEs**

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Terminology

Key terms used in this lesson included:

- Cardinality
- Optionality
- Relationship

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Summary

In this lesson, you should have learned how to:

- Interpret and describe relationship optionality
- Interpret and describe relationship cardinality
- Relate (connect or join) entities by applying the rules of cardinality and optionality

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