# IT 775
Database Technology

ER Modeling

Attributes

ATTRIBUTES

- **Attribute -** depiction of a characteristic of an entity

  - Represents the details that will be recorded for each entity instance

  - Within one entity, each attribute must have a different name

- **Unique Attribute** - attribute whose value is different for each entity instance

  - Every regular entity must have at least one unique attribute

ATTRIBUTES

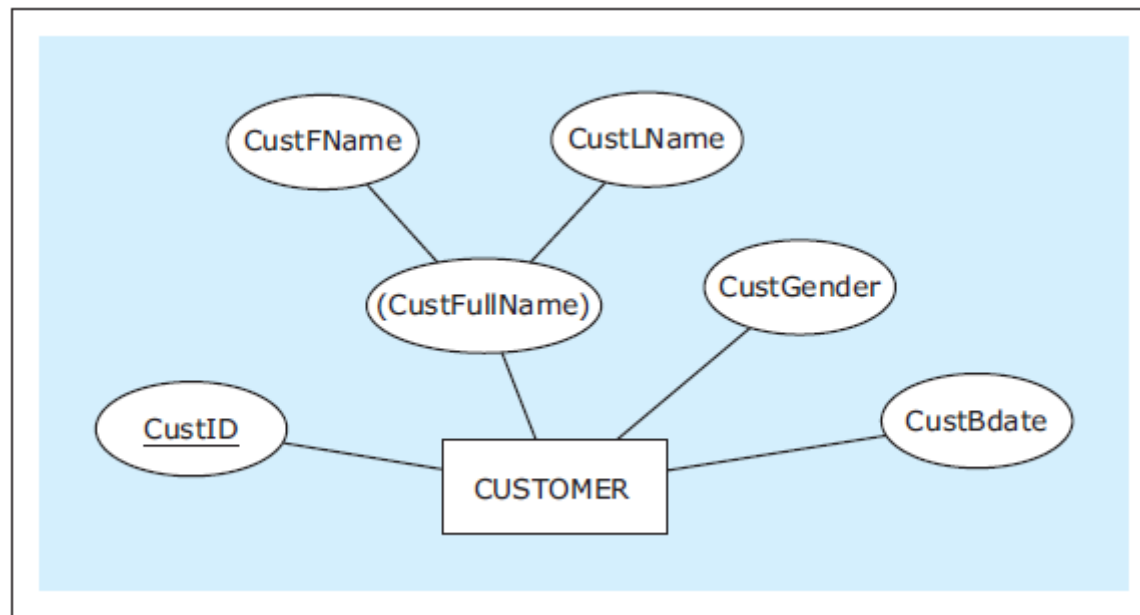## An entity with attributes
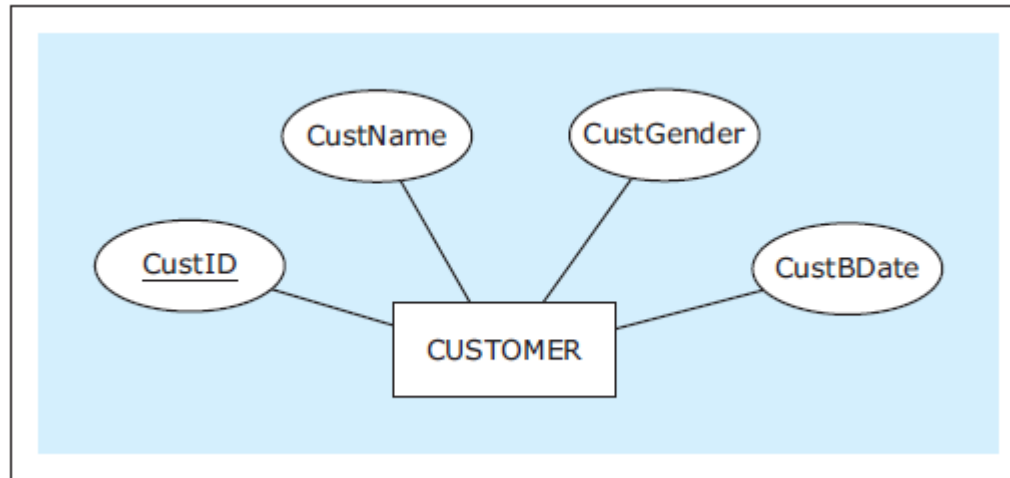
ATTRIBUTES

- **Composite attribute –** attribute that is composed of several attributes
  - Not an additional attribute of an entity
  - Its purpose is to indicate a situation in which a collection of attributes has an additional meaning, besides the individual meanings of each attribute
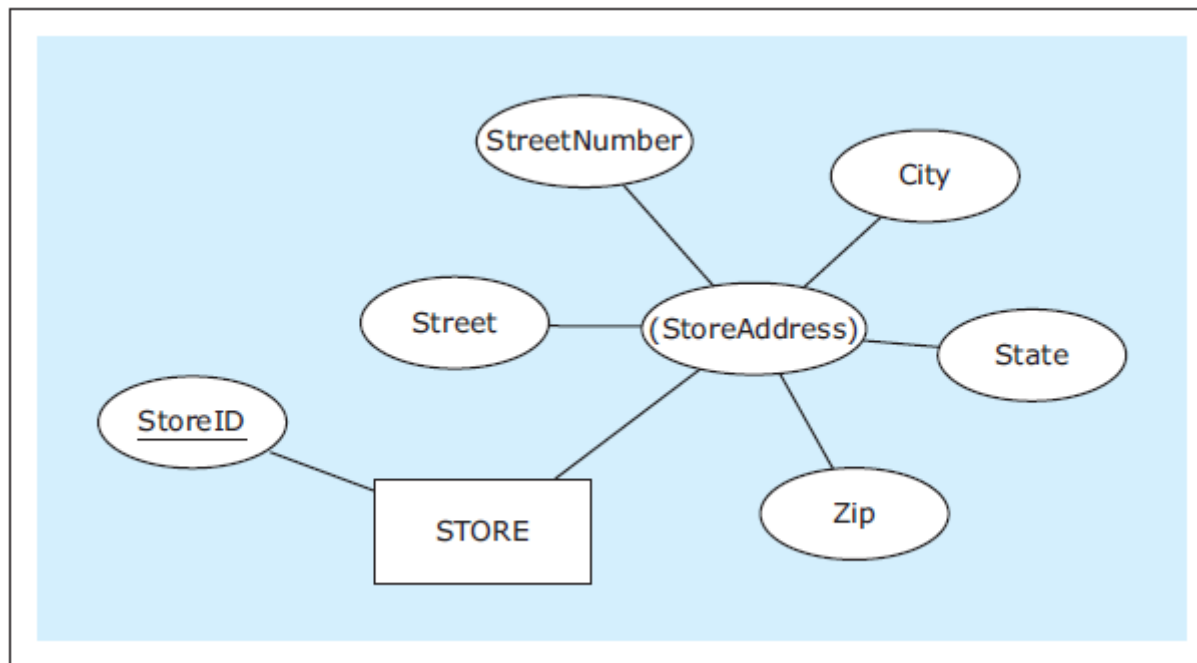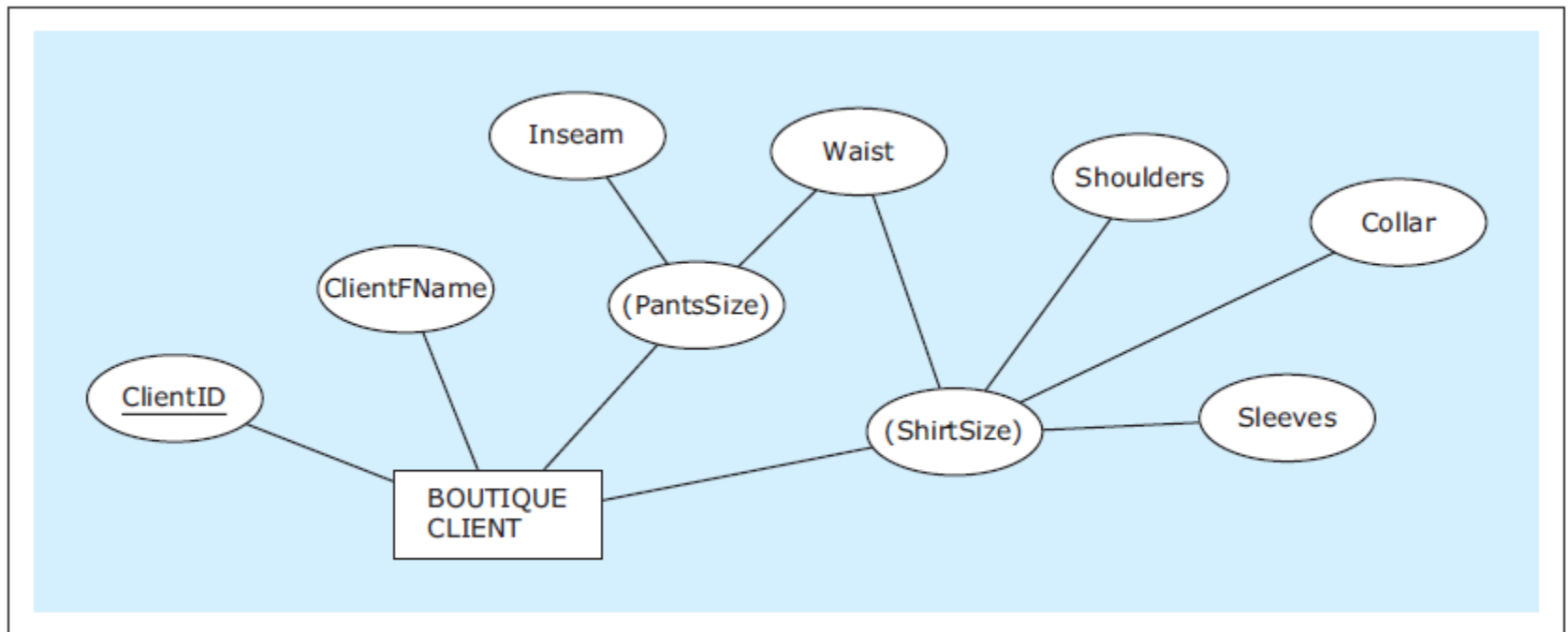
ATTRIBUTES

An entity with a composite attribute

ATTRIBUTES

Another entity with a composite attribute

ATTRIBUTES

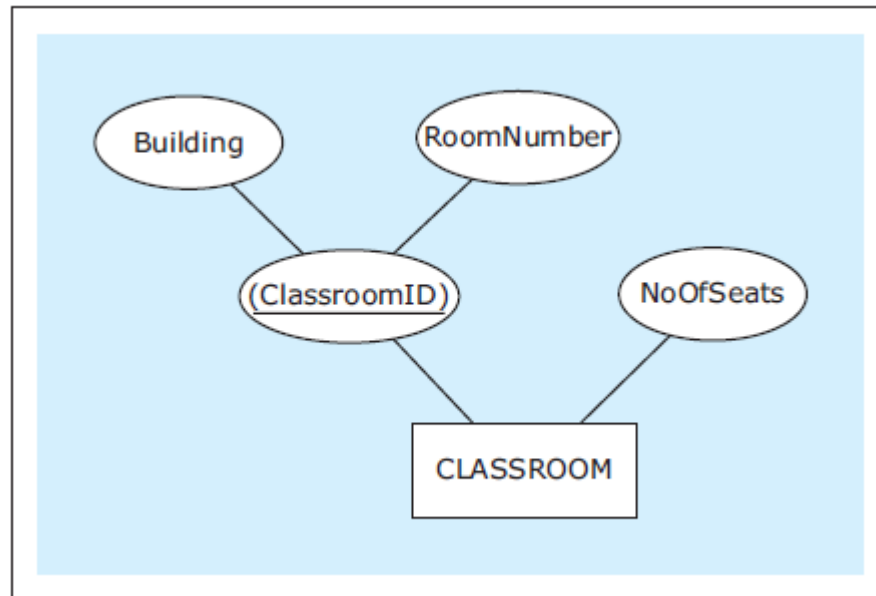## Composite attributes sharing components

ATTRIBUTES

- **Composite unique attribute –** attribute that is composed of several attributes and whose value is different for each entity instance

ATTRIBUTES

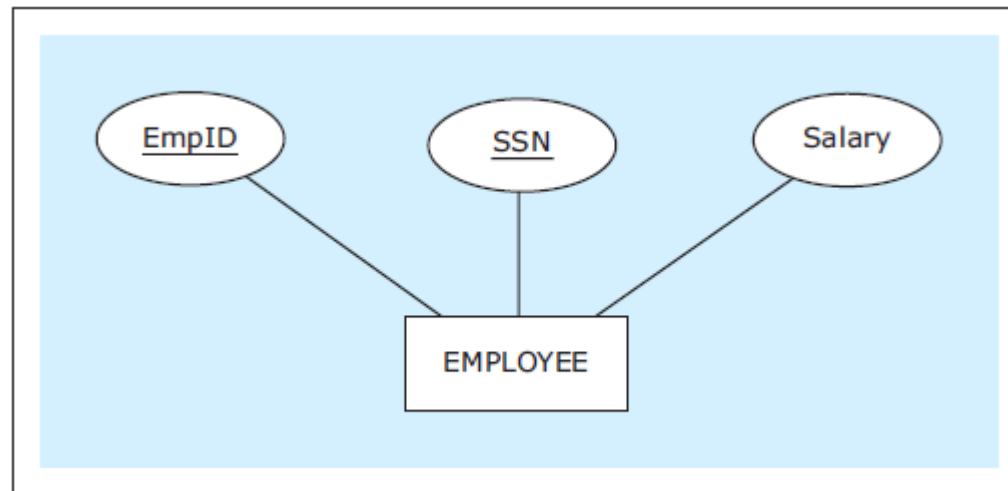## An entity with a unique composite attribute

ATTRIBUTES

- **Multiple unique attributes (candidate keys) -** when an entity has more than one unique attribute each unique attribute is also called a candidate key
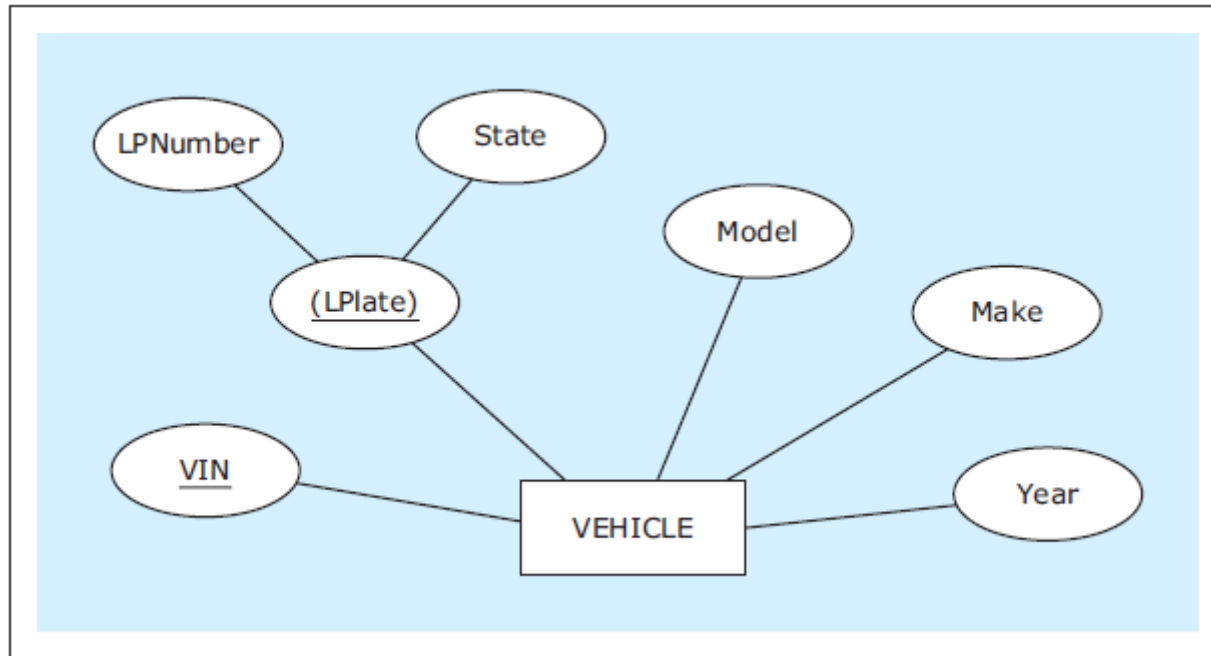
ATTRIBUTES

Multiple unique attributes (candidate keys)

ATTRIBUTES

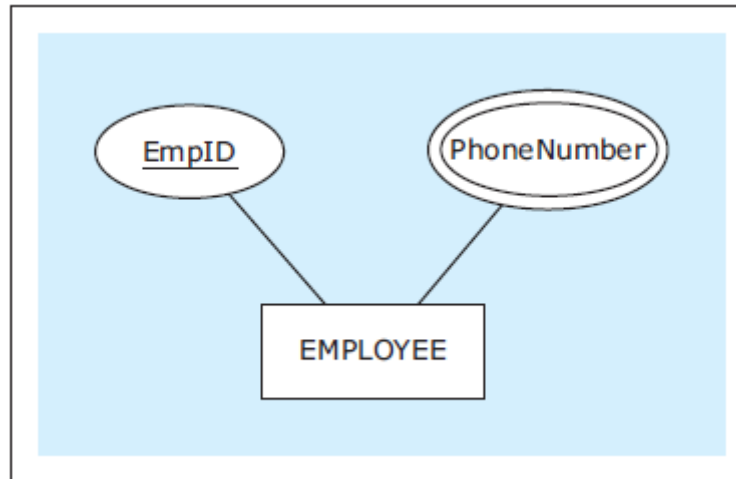## With regular and composite candidate key

ATTRIBUTES

- **Multivalued attribute -** attribute for which instances of an entity can have multiple values for the same attribute
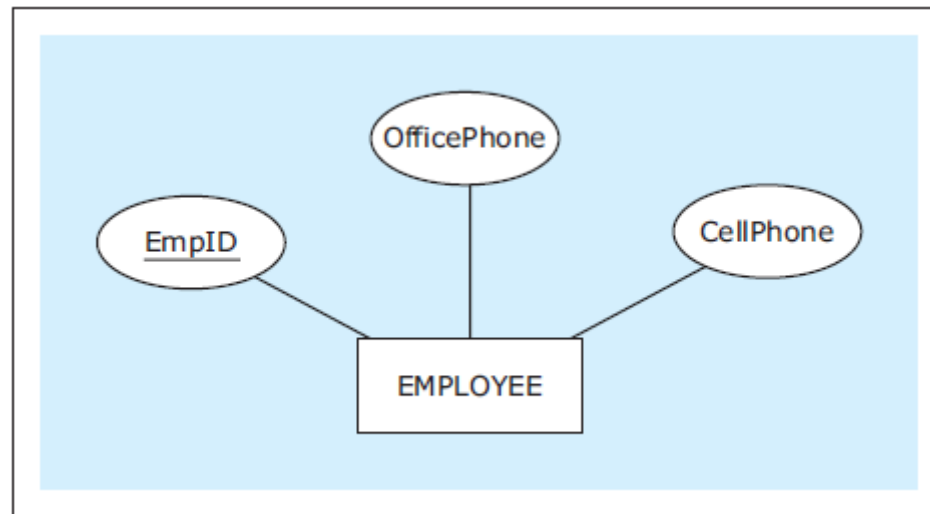
ATTRIBUTES

A multivalued attribute

ATTRIBUTES
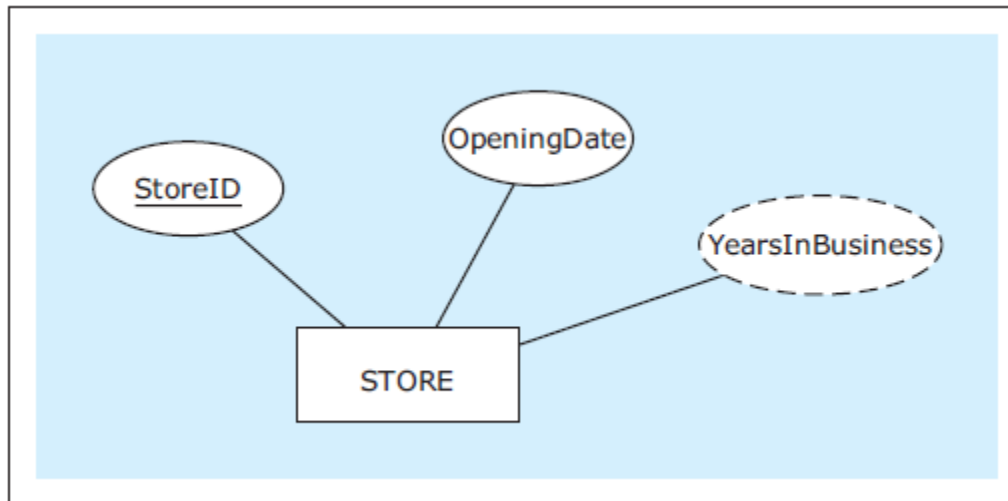
A scenario not using multivalued attributes

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- **Derived attribute -** attribute whose values are calculated and not permanently stored in a database
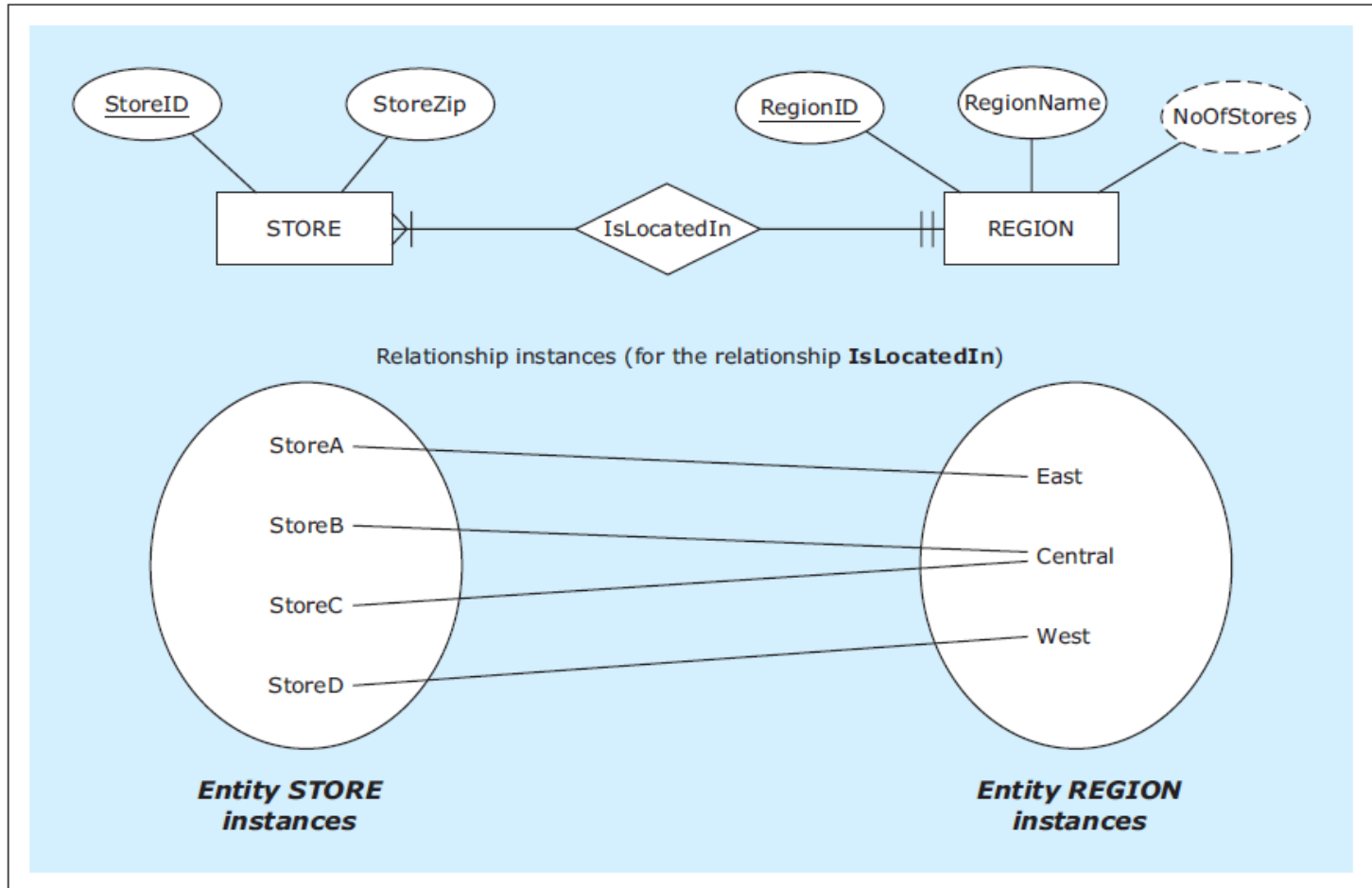
ATTRIBUTES

A derived attribute example
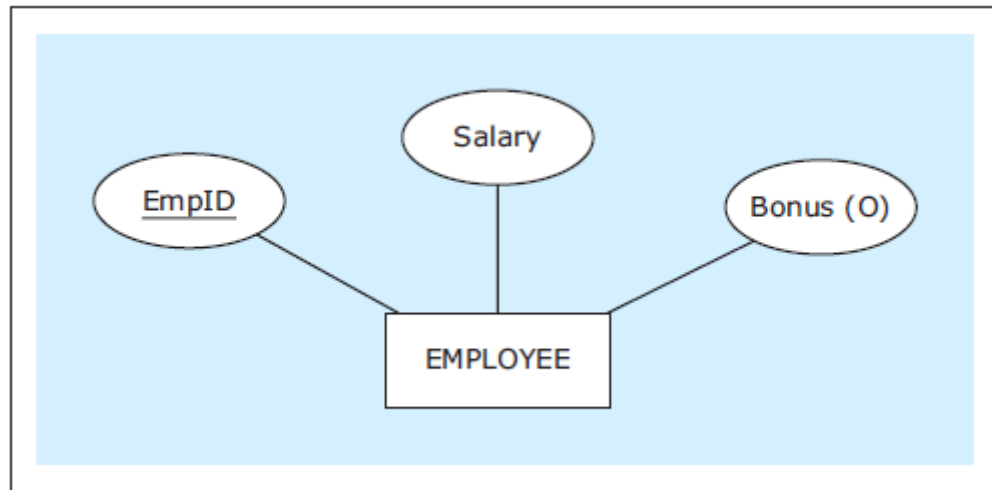
ATTRIBUTES

Another derived attribute example

ATTRIBUTES

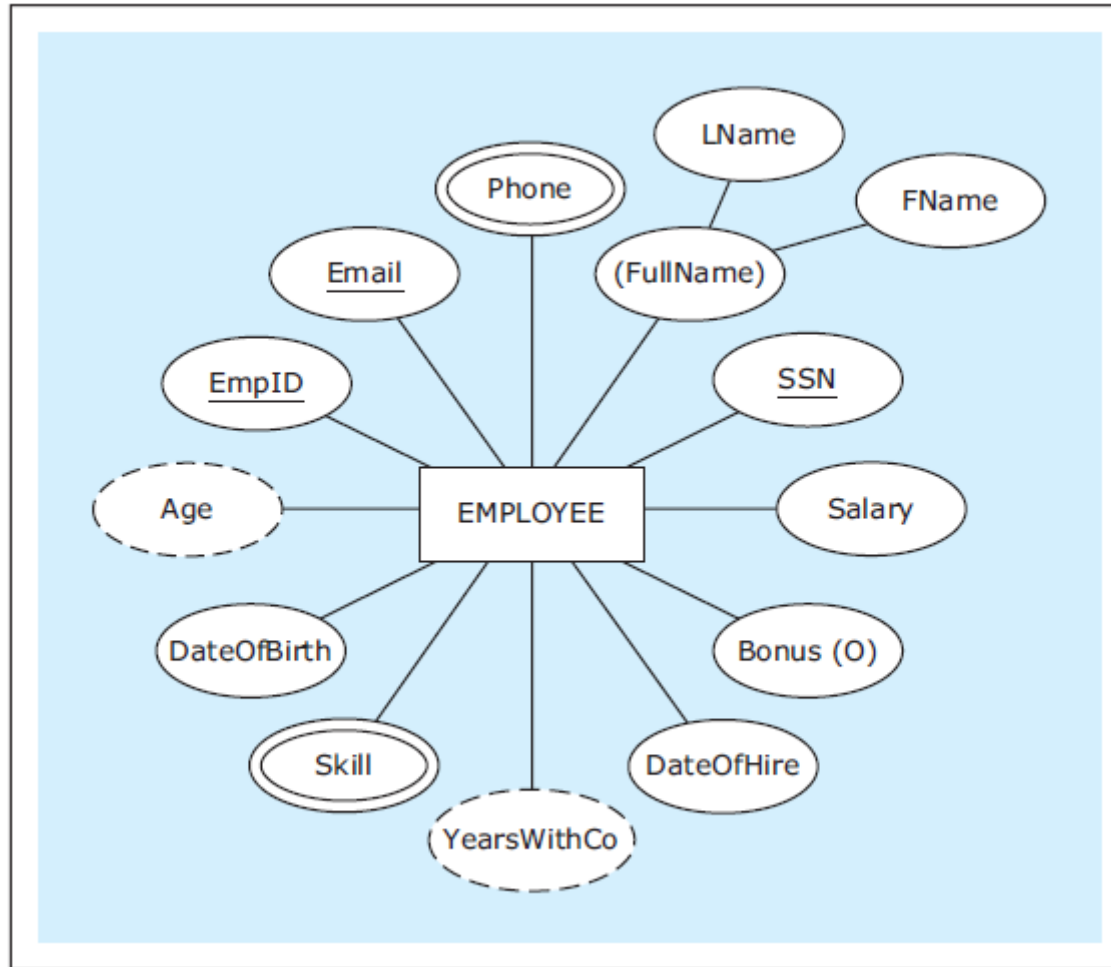- **Optional attribute -** attribute that is allowed to not have a value

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An optional attribute example

ATTRIBUTES

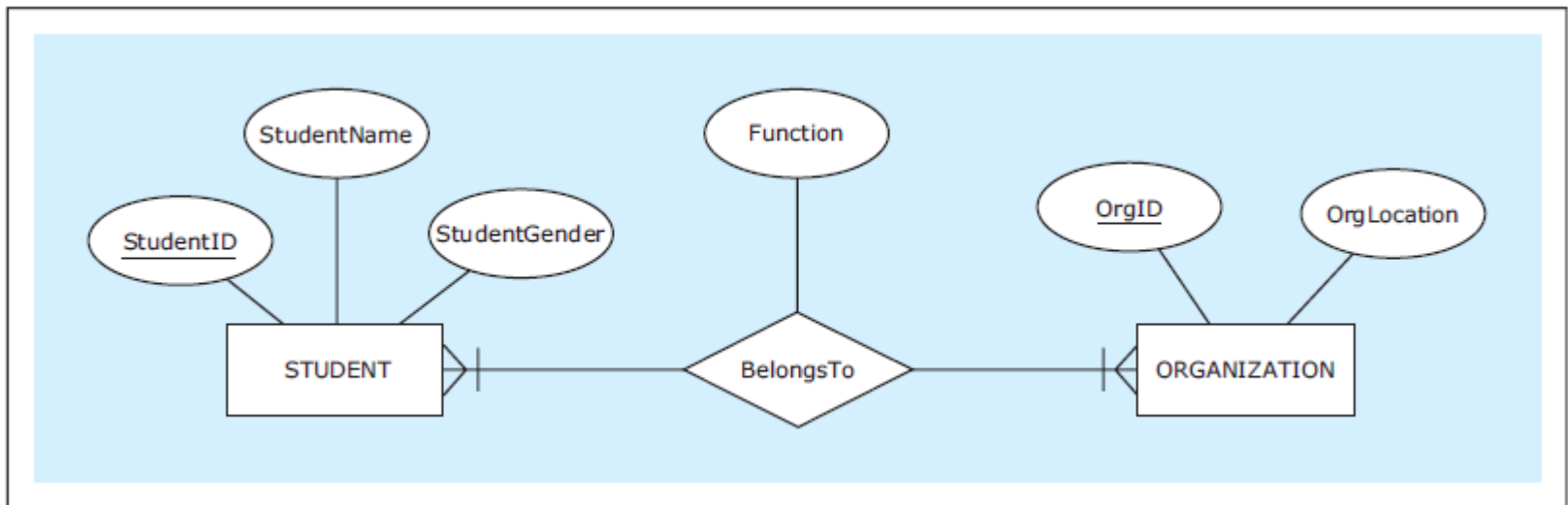## EXAMPLE: An entity with various types of attributes

Attributes

- **Relationship attributes**
  - In some cases M:N relationships can actually have attributes of their own

Attributes

A M:N relationship with an attribute

Attributes

A 1:M relationship with and without an attribute