

Database Design

2-2: Entities, Instances, Attributes and Identifiers

Practice Activities

Objectives

- Define and give an example of an entity
- Distinguish between an entity and an instance of an entity
- Name and describe attributes for a given entity
- Distinguish between an attribute and its value
- Distinguish between mandatory and optional attributes, and between volatile and nonvolatile attributes
- Select and justify a unique identifier (UID) for an entity

Vocabulary

Identify the vocabulary word for each definition below.

	Required
	Incapable of being perceived by the senses
	Any combination of attributes and/or relationships that serves, in all cases, to uniquely identify an instance of an entity
	An occurrence or example of an entity
	A characteristic; something that describes, quantifies, or specifies an entity
	Not required
	A named thing or category of things that is significant to the business and about which data must be known
	A value that is unavailable, unassigned, unknown, or empty; however, it is neither a zero nor a space
	Highly changeable
	Perceptible to the senses, especially the sense of touch
	A classification identifying one of various types of data, stating the possible values for that type, the operations that can be done on that type, and the way the values of that type are stored
	Can only have one value at any point for each instance in the entity

Try It / Solve It

1. Consider the entity STUDENT. You are all students in a class. However, each one of you is a unique instance of that entity. Your teacher will lead you through an exercise to demonstrate this.
2. Think about the last time you went to get a haircut, permanent, manicure, or other service from a barbershop or hair salon.

Discuss the business of a barbershop or hair salon. Name the entities that are the “main things” about this business. Give examples of instances for each entity.

3. The goal of this activity is to learn to make a distinction between an entity, an attribute, and an instance of an entity.

List which of the following concepts you think is an:

- entity
- attribute
- instance.

If you determine that one is an entity, then give an example of an instance. If you determine that one is an attribute or an instance, give a sample entity name. For the last three rows, find a concept that fits.

Concept	Entity? Attribute? Instance?	Example instance or Entity
Vehicle		
Diet Cola		
Price		
Customer number		
Green		
	Entity	Cookie
	Attribute	Cookie
	Instance	Cookie

4. The goal of this practice is to recognize attributes for an entity.

The three entities that play a role in a DJ business: SONG, EVENT, and CUSTOMER are listed as the first three column headings of the table below. The fourth column contains a collection of attributes. Use a check mark to indicate if the attribute listed could be an attribute for the entities listed. (For example, could Title be an attribute for Song, for Event, and for Customer?)

SONG	EVENT	CUSTOMER	
			Title
			Description
			Venue
			First Name
			Phone Number
			Release date
			Last Name
			Type
			Email address

5. From the list of attributes provided, identify which attribute could be the unique identifier of each entity.

Entity: STUDENT

Attributes: student id, first name, last name, address

Entity: MOVIE

Attributes: title, date released, producer, director

Entity: LOCKER

Attributes: size, location, number

6. Read the given business scenario and walk through the steps below.

"I'm the owner of a small movie rental store. We have over 3,000 movies that we need to keep track of.

"Each of our movies has a DVD or VHS tape number. For each movie, we need to know its title and category (e.g., comedy, suspense, drama, action, war, or sci-fi).

"Yes, we do have multiple copies of many of our movies.

"We give each movie a specific ID, and then track which DVD or VHS contains the movie. A movie can be either DVD or VHS format.

"We always have at least one DVD or VHS tape for each movie we track, and each DVD or VHS tape is always a copy of a single, specific movie.

"Our DVDs and VHS tapes are very long. We don't have any movies that require multiple DVDs or VHS tapes."

- a. Write a list of nouns used in the scenario.
- b. Name each entity.
- c. Is each instance of the entity uniquely identifiable? Which attribute or attributes could serve as the unique attribute to identify the entity?

7. Age is an example of what type of attribute?

8. Birth date is an example of what type of attribute?

9. Read the business scenario of a fast-food restaurant below:

We are a small fast food business. Our menu features food items that can be ordered by a customer. A customer places an order at the counter and indicates what food items he/she would like on that order.

Lately we've noticed that we have some regular customers, so we started asking them for information -- such as name and address, so we can mail them coupons when we have specials.

- a. Using the restaurant entities ORDER, FOOD ITEM, AND CUSTOMER, identify the attributes for each entity.
- b. Where possible, indicate whether the attribute is mandatory or optional.
- c. Where possible, pick out the UUIDs for each entity