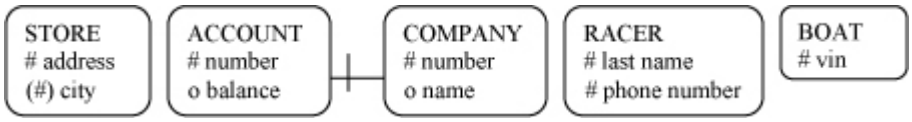
Database Design
6-1: Artificial, Composite, and Secondary UIDs
Practice Solutions
Vocabulary

Directions: Identify the vocabulary word for each definition below.

UID	Unique identifier
Simple UID	A UID that is a single attribute
Composite UID	A UID that is a combination of attributes
Artificial UID	A UID that does not occur in the natural world but is created for identification purposes in a system
Candidate UID	One of several UIDs that could identify something
Primary UID	A candidate UID that is the primary identifier of something
Secondary UID	A candidate UID that also identifies something, but is not the primary UID

Try It / Solve It

1. Match the type of Unique identifier to the entity.
   a. Simple UID
   b. Composite UID
   c. Composite UID comprising an attribute and a relationship
   d. Primary Key & Secondary Key



_____ _____ _____ _____

Solution: d, c, b, a

2. Consider an entity for Library Member. Sometimes an entity can have more than one candidate UID. Describe a scenario where you would want more than one candidate UID for a Library Member – why would you want to find the member in the database using alternative information?

   Possible Solution: Library member has lost his membership id and you need to find him in the database using his phone number instead.

3. Describe how you would identify the entities listed below, making up any attributes and relationships you consider appropriate. For example, for the Student entity you may say

that the UID is comprised of the first name, last name, and address. Or you might suggest that the Student entity contains an artificial UID called student number.

a. A city
b. A contact person for a customer
c. A train
d. A road
e. A financial transaction
f. An award (for example: movies)
g. A painting

Solution: The solutions here do not cover all the possible answers. This is another opportunity for your students to be creative as they think of situations that will and will not work with the proposed UID. In all cases, students may opt to just create an artificial ID. This is valid. However, encourage them to find attributes in the entities first, or create related entities that can help compose a "real" UID.

a. City
Name and country is not always sufficient. In some countries, you would also need province or state because there will be multiple cities with the same name within one country. Some countries use a unique postal code per town or city. Geographical coordinates, such as latitude and longitude, are unique but may not be very practical for the business that is requesting the design.

b. Contact Person for a Customer
Name, job (or telephone number), and customer ID are probably enough.

c. Train
Trains often have a unique ID and name. You could also use the time, the originating point, and the destination. The railroad company uses a code for internal use.

d. Road
Most important roads have a name, such as Route 60 or I95. Unimportant roads might not have a name. In this case, geographical information (such as both ends of the road) can be used as the UID.

e. Financial Transaction
Use the combination of from account, to account, date, and time. You need time because there may be several transactions to and from the same account on the same date.

f. An Award
In the case of a movie award (such as an Oscar or a Cesar), you can identify it by the recipient, the year, the movie, and the category (cinematography, supporting male role, etc.).

g. Painting
Not all paintings are identified by title, painter, and year. Museums will often create an ID.

4. Identify one of the issues with respect to a national identification system. Provide your point of view on the issue.

Solution: Answers will vary

5. You have previously reviewed the video store business requirements stated below:

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

   "Each of our DVDs has a disk 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 we track which movie a disk contains. A disk may be either High Definition (HD) or BlueRay format. We always have at least one disk for each movie we track, and each disk is always a copy of a single, specific movie. Our disks are very big, although we don't have any movies that require multiple disks."

   For this activity read the new business requirements below and resolve the M:M relationship. Identify UIDs for all the entities that require multiple tapes.

   "We are frequently asked for movies starring specific actors. John Wayne and Katherine Hepburn are always popular. So we'd like to keep track of the star actors appearing in each movie. Not all of our movies have star actors. Customers like to know each actor's "real" birth name and date of birth. We track only actors who appear in the movies in our inventory.

   "We have lots of customers. We only rent DVDs to people who have joined our DVD club. To belong to our club, they must have good credit. For each club member, we'd like to keep the first and last name, current phone number, and current address. And, of course, each club member has a membership number.

   "Then we need to keep track of what DVDs each customer currently has checked out. A customer may check out multiple DVDs at any given time. We just track current rentals. We don't keep track of any rental histories."

   Solution: Some students may not understand why STAR BILLING has no attributes. Remind them that this is valid, as long as it has a UID (the barred relationships from MOVIE and ACTOR). You can also suggest that they come up with appropriate attributes, such as review or comments.