Database Design
6-2: Normalization and First Normal Form
Practice Solutions
Vocabulary

Directions: Identify the vocabulary word for each definition below.

First Normal Form (1NF)	The outcome of the first step of database normalization. 1NF eliminates repeating groups by putting each into a separate table and connecting them with a 1:M relationship
Normalization	A series of steps followed to obtain a database design that allows for efficient access and storage of data in a relational database. These steps reduce data redundancy and the chances of data becoming inconsistent

Try It / Solve It

1. When checking a database model for first normal form what are you doing exactly?
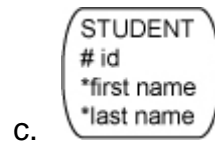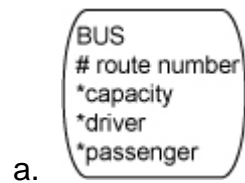
   Solution: Verifying that each entity contains attributes that are appropriate for it; insuring that the entity has a UID; checking each attribute against its UID and verifying that the attribute only contains a single value.

2. What is the rule of 1NF in the normalization process?

   Solution: 1NF rule has three parts:
   a) identify the related data parts (attributes) and place them together in one entity; if multiple entities exist, attributes should be listed one time only and in the best possible location
   b) identify the UID of the entity
   c) remove any attribute that contains repeating groups (multiple values) and place it in its own entity; create a 1:M relationship between the two entities

3. Check to see if each ERD is in 1NF. If not, make the necessary changes to correct it.

a.
```
BUS
# route number
*capacity
*driver
*passenger
```

b.
```
DORMITORY          located on      CAMPUS
# number                           # id
* address                          * name
*resident            have
```

c.
```
STUDENT
# id
*first name
*last name
```

Solution: Problems a. and b. need to be altered. Problem c. is in 1NF..

```
PASSENGER   ride in       BUS
# id                      # route number
* name                    *capacity
            transport     *driver
```

```
DORMITORY    located on     CAMPUS
# number                     # id
* address                    * name
             have
house

        house in
RESIDENT
# first name
* last name
* room number
```