**Chapter 6 Your Turn 6A-1**

**Normalizing a student data file with the following fields:**

* Student social security number (identifier)
* Activity 1 code (identifier)
* Activity 1 description
* Activity 1 start date
* Activity 1 years with activity
* Activity 2 code
* Activity 2 description
* Activity 2 start date
* Activity 3 code
* Activity 3 description
* Activity 3 start date
* Activity 3 years with activity
* Student last name
* Student first name
* Student birthdate
* Student age
* Student advisor name
* Student advisor phone

The rule for first normal form is to remove any attributes or groups of attributes that appear more than once in a single entity. Essentially for first normal form you just need to remove any repeating groups to form its own entity. The repeating group of attributes that describe each item included in the Activity is separated out into its own Activity entity.

ACTIVITY

STUDENT

\*Student SSN

Student Last Name

Student First Name

Student Birthdate

Student Age

Student Advisor Name

Student Advisor Phone

\*Activity Code

Activity Description

Activity Start Date

Activity Number of Years

The rule for second normal form is to assess all entities that contain concatenated keys to make sure that all non-key attributes depend on the entire concatenated key, not just part of the key. In this example there are no concatenated keys, so the model is already considered to be in 2NF.

To place an entity into third normal form you need to make sure that the values of any non-key attribute do not depend on any other non-key attributes. Essentially for third normal form all attributes that aren’t part of the primary key must depend on only the primary key. For the Student entity, the Advisor Phone depends on just the Advisor Name. These attributes should be moved to their own entity that describes just the advisor. A new table should also be formed with the concatenated primary key consisting of Student SSN and Activity Code which were the primary keys of the Student and Activity entities.

\*Student SSN

Student Last Name

Student First Name

Student Birthdate

Student Age

Student Advisor Name

Student Advisor Phone

ACTIVITY

STUDENT

\*Student SSN

\*Activity Code

Activity Start Date

Activity Number of Years

\*Advisor Name

Advisor Phone

ADVISOR

\*Activity Code

Activity Description

Activity Start Date

Activity Number of Years

STUDENT\_ACTIVITY