**Chapter 2: Colonial Adventure Tours**

1. Using the types of entities found in the Colonial Adventure Tours database (trips, guides, customers, and reservations), create an example of a table that is in first normal form but not in second normal form, and an example of a table that is in second normal form but not in third normal form. In each case, justify your answers and show how to convert to the higher forms.
   1. With creating a 1NF but not 2NF table:
      1. GUIDE\_TRIP (**TRIP\_ID, GUIDE\_NUM,** TRIP\_NAME);
      2. The primary keys are TRIP\_ID and GUIDE\_NUM.
   2. Converting from 1NF to 2NF you would need to separate the trip from the guide
      1. TRIP (**TRIP\_ID,** TRIP\_NAME) && GUIDE\_TRIP (**TRIP\_ID**, **GUIDE\_NUM**);
   3. Creating a 2NF but not 3NF:
      1. RESERVATION (**RESERVATION\_ID**, TRIP\_ID, REP\_NUM, LAST\_NAME, FIRST\_NAME);
      2. The Primary Key is reservation
   4. Converting to 3NF:
      1. REPRESENTATIVE (REP\_NUM, LAST\_NAME, FIRST\_NAME, RESERVATION (**RESERVATION\_ID**, TRIP\_ID, REP\_NUM));
2. Identify the functional dependencies in the following unnormalized table. Convert the table to third normal form.
   1. TRIP (TRIP\_ID, TRIP\_NAME, STATE\_ABBREVIATION, STATE\_NAME, (GUIDE\_NUM, GUIDE\_LAST, GUIDE\_FIRST));
      1. The functional dependencies in the table above are:
         1. TRIP\_ID, TRIP\_NAME, STATE\_ABBREVIATION, STATE\_NAME
         2. GUIDE\_NUM, GUIDE\_LAST, GUIDE\_FIRST
         3. STATE\_ABBREVIATION, STATE\_NAME
      2. The values on the right are dependent on the to those on the left
   2. Converting the table to 3NF:
      1. TRIP (TRIP\_ID, TRIP\_NAME, STATE\_ABBREVIATION);
      2. STATE (STATE\_ABBREVIATION, STATE\_NAME);
      3. GUIDE (GUIDE\_NUM, GUIDE\_FIRST, GUIDE\_LAST);
      4. TRIP\_GUIDE (TRIP\_ID, GUIDE\_NUM);
3. Colonial Adventure Tours is considering offering outdoor adventure classes to prepare people to participate in hiking, biking, and paddling adventures. Only one class is taught on any give day. Participants can enroll in one or more classes. Classes are taught by the guides that Colonial Adventure employs. Participants do not know who the instructor for a particular class will be until the day of the class. Colonial Adventure tours needs your help with the database design for this new venture. In each step, represent your answer using the shorthand representation and a diagram. You may use any of the styles presented in the chapter for the diagram.
   1. For each participant, list his or her number, last name, first name, address, city, state, postal code, telephone number, and date of birth.
      1. PARTICIPANT (PARTICIPANT\_ID, FIRST\_NAME, LAST\_NAME, ADDRESS, CITY, STATE, ZIP\_CODE, PHONE, DOB);
   2. For each adventure class, list the class number, class description, maximum number of people in the class, and class fee.
      1. ADVENTURE\_CLASS (AC\_ID, DESCRIPTION, MAX\_NUM\_STDNTS, FEE);
   3. For each participant, list his or her number, last name, first name, and the class number, class description, and date of the class for each class in which the participant is enrolled.
      1. CLASS\_PARTICIPANTS (PARTICIPANT\_ID, FIRST\_NAME, LAST\_NAME, AC\_ID, CLASS\_DATE, DESCRIPTION);
   4. For each class, list the class date, class number, and class description; and the number, last name, and first name of each participant in the class.
      1. CLASS\_LIST (CLASS\_DATE, AC\_ID, DESCRIPTION, NUMBER, FIRST\_NAME, LAST\_NAME);

ADDRESS

CITY

STATE

FIRST\_NAME

CLASS\_DATE

AC\_ID

CLASS\_LIST

DESCRIPTION

NUMBER

FIRST\_NAME

LAST\_NAME

DESCRIPTION

FIRST\_NAME

CLASS\_DATE

LAST\_NAME

AC\_ID

PARTICIPANT\_ID

ZIP\_CODE

DOB

LAST\_NAME

PARTICIPANT\_ID

PARTICIPANT

ADVENTURE\_CLASS

CLASS\_PARTICIPANTS

MAX\_NUM\_STDNTS

FEE

DESCRIPTION

AC\_ID