Lab 4: Potpourri, Part 2

Due date: Monday, February 4, 11:59pm

Note: Lab 5 will be assigned on Monday, February 4, in class.

Lab Assignment

Assignment Preparation

This is an individual lab. Each student has to complete all work required in the lab, and submit all required materials exactly as specified in this assignment.

The lab has two sets of tasks:

- **Fix your databases.** You will receive the grades for your database creation scripts from Lab 2. You are required to fix all errors, and submit the final version of your databases. There is a slight change in the submission requirements for this part, see below.

- **Data manipulation and formatting tasks.** Similarly to Lab 3, there are four data manipulation/formatting tasks in this lab. The tasks use the four datasets, BAKERY, CSU, INN and AIRLINES, which were not used in Lab 3.

Fixing the Databases

You will receive your Lab 2 grades (for the portion of the lab covering CREATE TABLE statements). The graded `<DATABASE>-setup.sql` scripts are given to you in hardcopy, with any errors clearly marked.

You need to do the following:

1. fix all errors and finalize the content of `<DATABASE>-setup.sql` files;
2. ensure that all insertions proceed correctly with the new setup scripts, fix any issues;

3. submit fixed script collections for ALL eight datasets (including the ones, for which there are no data manipulation assignments in this lab).

Submission filenames. You will submit the following files for each dataset:

- `<DATABASE>-setup.sql`: your CREATE TABLE statements.
- `<DATABASE>-insert.sql`: one SQL script that inserts ALL tuples to ALL tables of the database. This file can be constructed in one of two ways:
  - Concatenate the contents of all `<DATABASE>-build-<table>.sql` files. If you do it this way, then submit ONLY `<DATABASE>-insert.sql`.
  - Put a sequence of `start <DATABASE>-build-<table>.sql` commands in the body of your `<DATABASE>-insert.sql` script. In this case, you need to submit all `<DATABASE>-build-<table>.sql` scripts as well.
- `<DATABASE>-cleanup.sql`: the DROP TABLE script.
- `<DATABASE>-test.sql`: the database test script.

In addition, for the AIRLINES, BAKERY, CSU and INN datasets, you will include `<DATASET>-modify.sql` file that performs the actions specified below.

Data Manipulation and Formatting Tasks

The assignments in this part are specific to individual databases you created in Lab 2. Please execute them only on the specified datasets. The assignments may ask you to change both the schemas and the instances of the databases.

One assignment asks you to show proficiency in learning `sqlplus` commands by properly formatting an output for a query.

[AIRLINES dataset.] Create an SQL script `AIRLINES-modify.sql` which performs the actions described below.

You will modeling corporate takeover of a number of routes from one airport in the database.

1. Remove from the flights database all flights except for those to and from AOS (that’s the airport code).
2. You will be modeling corporate takeover by Northwest of all flights except those operated by Virgin and Jet Blue to and from AOS. For this assignment (and this assignment only), you will look up the numeric IDs for each airline, and substitute them for airline names in the commands you need to develop.

3. For all flights NOT operated by Northwest, Jet Blue or Virgin, increase the flight number by 2000 (this will ensure that after the corporate takeover, flight numbers are still unique).

4. All flights in the Flights table come in pairs. The first flight starts at Airport 1 and goes to Airport 2. The second flight goes from Airport 2 to Airport 1 (the return flight). The flight numbers of these two flights are different by 1 - one flight number is even, one is odd.

For all pairs of flights to/from AOS NOT operated by Northwest, Jet Blue or Virgin, you need to flip the flight numbers. That is, if a flight from AOS to some other airport had an even flight number $N$, it needs to be replaced by $N + 1$, while, the flight number for a return flight will change from $N + 1$ to $N$. Conversely, if a flight from AOS has an odd flight number $N$, it needs to be replaced by $N - 1$, while the flight number of the return flight needs to change from $N - 1$ to $N$.

(In other words, all even-numbered flights need to increase by 1, all odd-numbered flights need to decrease by 1.)

Write a sequence of SQL commands that achieve this result.

**NOTE:** You can use built-in `MOD(N,D)` function which returns the remainder of deleting $N$ by $D$.

Also, you can perform any temporary operations with the Flights table you want to achieve this task, as long as you clean up after yourself - i.e., as long as after all the commands are completed, the only change in the Flights table is the flipped flight numbers.

5. Complete the corporate takeover. Replace the airline for all flights to and from AOS except for Jet Blue and Virgin with Northwest.

6. Output the contents of the flights table using the following SQL statement:

```sql
SELECT *
FROM <Flights-table>
ORDER BY <Airline-column>, <flight-no-column>;
```

Replacing `<Flights-table>` with the name of the flights table in your database, and replacing `<Airline-column>` and `<flight-no-column>` with the name of the appropriate columns in that table.
[BAKERY dataset.] Create an SQL script BAKERY-modify.sql which performs the actions below.

1. Remove from the table containing the listing of the pastries, information about all pastries except for Cakes.

2. The bakery manager is looking to adjust the prices of the pastries to accommodate for seasonal changes in the prices of the ingredients. Fresh fruit is more expensive in the winter, so cakes that have fruit in them become more expensive. Some other cakes are not selling as well as expected, so the manager wants to lower some of the prices.

3. Increase the prices of the Strawberry Cake and the Lemon Cake by 20%.

4. Reduce the prices of Chocolate Cake and Napoleon Cake by $2.

5. Reduce the price of all other cakes by 10%.

6. Show the contents of the table using the following SQL statement:

   ```sql
   SELECT *
   FROM <Pastry-table>
   ORDER BY GID;
   ```

   replacing `<Pastry-table>` with the name of the table containing the list of pastries in your database.

[CSU dataset.] Create an SQL script CSU-modify.sql which performs the actions below.

For this assignment (and this assignment only), you need to look up the campus ID number for each campus name mentioned below, and the numeric discipline enrollment ID for each discipline mentioned below, and use these Id numbers in the commands where campus identity and/or discipline identity is used.

1. Keep in the table documenting campus enrollments by discipline only the information about the following enrollments:

   - Undeclared majors from Cal State Fullerton and Cal State Long Beach.
   - Enrollments at Cal Poly San Luis Obispo in disciplines with non-zero graduate enrollment and the undergraduate enrollment under 500.
   - Engineering enrollments exceeding 2000 undergraduates at any CSU campus.

2. Output the remaining contents of the discipline enrollments table using the following SQL statement:
SELECT *
FROM <Discipline-Enrollments-Table>
ORDER BY <CampusID-column>, <DisciplineId-column>

replacing <Discipline-Enrollments-Table> with the name of the
discipline enrollments table in your database, and replacing <Campus-ID-column>
and <DisciplineId-column> with the names of the appropriate attributes in that table.

3. Keep in the table documenting CSU fees only the information that
matches ALL the conditions below:

- The fee is greater than $2,500;
- The year is either 2002 or one of 2004—2006.
- The campus is either Cal Poly San Luis Obispo, Cal Poly Pomona
  or San Jose State.

4. Output the remaining contents of the fees table using the following
SQL command:

SELECT *
FROM <Fees-table>
ORDER BY <CampusId-column>, <Year-column>

replacing <Fees-table> with the name of the CSU fees table in your
database, and replacing <CampusId-column> and <Year-column> with
the names of the appropriate columns in that table.

[INN dataset] This assignment asks you to both manipulate the data in
the database, and to output it using sqlplus formatting instructions.

Create a SQL script INN-modify.sql which performs the following actions.

1. Keep in the reservations table only the reservations that start in the
first half of September of 2010 (September 1 through September 15
inclusively) that involve no kids.

2. Keep in the reservations table only the columns for the reservation
code, room code, checkin date, last name on the reservation and the
number of adults.

3. Replace column names with the following column headings:

   (a) 'RES=' for the unique Id of each reservation
   (b) 'Room Code' for the column storing the room code
   (c) 'Arriving on...' for the column storing the checkin date
   (d) 'Guest Name' for the column storing the last name of the guest
(e) ‘# Guests’ for the column storing the number of adults

4. Set the length of line of output so that each output row of the SQL query specified below was printed on a single line. (Do not make the length of the line TOO long though, you will be penalized for that.)

5. Set the length of a page so that the entire output of the SQL query specified below fits on a single page.

6. Specify that the column separator in the output is ‘+’.

7. Specify that the character used to underline the header of the query is ‘+’ (dot).

8. Specify that in the output of the SQL query given below, each room code should appear exactly once, and the set of records for a single room, shall be separated from other records by one empty line. Additionally, specify that each number of adults shall be reported exactly once.

9. Run the following SQL query:

```sql
SELECT *
FROM <Reservations-table>
ORDER BY <roomCode-column>, <Adults-column>, <ReservationCode-column>;
```

where <Reservations-table> is the name of the car data table in your INN database and <roomCode-column>, <Adults-column> and <ReservationCode-column> are the column names storing information about room codes, number of adults and reservation codes respectively in the reservations table.

The result of the query formatted as required is available from the Lab 4 data page. Your script must produce the same character-for-character output (exempting some whitespace due to differences in string attribute lengths and such).

Submission Instructions

Please, follow these instructions exactly. Up to 10% of the Lab 4 grade will be assigned for conformance to the assignment specifications, including the submission instructions.

Please, name your files exactly as requested (including capitalization), and submit all files in a single archive. Correct submission simplifies grading, and ensures its correctness.

Please include your name and Cal Poly email address in all files you are submitting. If you are submitting code/scripts, include, at the beginning of the file a few comment lines with this information. Files that cannot be authenticated by observing their content will result in penalties assessed for your work.
Specific Instructions

You must submit all your files in a single archive. Accepted formats are gzipped tar (.tar.gz) or zip (.zip).

The file you are submitting must be named lab4.zip or lab4.tar.gz.

Inside it, the archive shall contain all eight dataset directories. AIRLINES, CSU, BAKERY and INN directories must contain the appropriate <DATABASE>-modify.sql files. All directories must contain the new versions of the database creation, deletion and test files.

In addition, the root of the directory must contain a README file, which should, at a minimum, contain your name, Cal Poly email, and any specific comments concerning your submission.

Submit your archive using the following handin command:

Section 01:

handin dekhtyar lab04-01 <file>

Section 03:

handin dekhtyar lab04-03 <file>

Testing

Your submission will be tested by running all scripts you supply and checking the produced output for correctness. I may also use some extra scripts to verify the correctness of the databases you have constructed.

If you are aware of any bugs, or incorrect behavior of your SQL scripts, I strongly suggest that you mention it in the README file.