Assignment #5: Basic SQL

Release: Feb. 13, 2020   Due: 8:00 PM, Feb. 19, 2020

Goal

Gain familiarity with SQL. We will use the *P_Mobile* Database Schema of Assignment#2 (HW2). You will create and manipulate the database using SQL in the Oracle server.

Description

- Assume the following relational database schema that supports a cell phone company, *P_Mobile*, that specializes in inexpensive wireless services to the University of Pittsburgh community of students, faculty, staff, and friends (*pn*, is short for phone number):

    - CUSTOMERS = (SSN, fname, lname, cell_pn, home_pn, street, city, zip, state, free_min, DOB, free_SMS)
    - RECORDS (from_pn, to_pn, start_timestamp, duration, type)
    - STATEMENTS (cell_pn, start_date, end_date, total_minutes, total_SMS, amount_due)
    - PAYMENTS (cell_pn, paid_on, amount_paid)
    - DIRECTORY (pn, fname, lname, street, city, zip, state)

- For this assignment, create tables from the sample solutions of Q2 and Q3 in HW2, **(i.e., no INSERT statements)**. Then, answer the following questions [for a total of 100 points]:

Questions

1. [total of 5 points] Alter the tables created from the sample solutions of Q2 and Q3 in HW2, such that (incorporate your ALTER statements in your 'db' script):

    (a) Add a new attribute to the relation PAYMENTS called 'payer_SSN' of type number(9).
    (b) Add a foreign key constraint to the relation PAYMENTS on the newly created attribute 'payer_SSN', and make it references the attribute 'SSN' in the relation CUSTOMERS.

2. [total of 5 points] Run all the INSERT statements from the sample solution for Q4 in HW2 except the last 5 INSERTs for PAYMENTS relation. Then, modify the INSERTs for PAYMENTS, such that we can insert them with respect to the changes in Q1. (incorporate your modified INSERT statements in your 'db' script).

3. [10 points each] Express the following queries in SQL and answer them using the database you have created above. Do not use any views.

    (a) List the full names (as one attribute) of *P_Mobile* customers who live in Pittsburgh and whose free SMSs is more than 100.
    (b) List the first name, last name and phone number of all customers who owe more than $90. List them in ascending order of amount_due.

(c) For each customer, list all phone numbers of people who sent SMSs to that customer in a descending order of the SMS timestamp.

(d) Calculate the average length of a phone call in September 2019.

(e) Calculate the total amount of payments due for the month of September 2019 for each zip code. List them in an ascending order.

(f) Find the first and last name of the customer who made the longest phone call on Jan 1st, 2019.

(g) List the number of *P_Mobile* customers in each state.

(h) List the full names of *P_Mobile* customers who has not made any calls for the last 7 months.

(i) List the top 2 cities with the highest local traffic (i.e., maximum number of local calls). A local call is one where both the caller and dialed numbers are in the same city.

What to submit

You are required to submit **exactly two** text files under your **pitt_user_name** (e.g, pitt01). **include your name and pitt user name at the top of the text file as a COMMENT**, and identify the question number before each answer.

- **<pitt_user_name>-db.sql**
  In this file, please submit the answers to question 1 and 2. (i.e., ALTER TABLE, and INSERT statements.) In addition to providing the answers, you are expected to: The entire text file should be composed of **valid SQL statements**.

- **<pitt_user_name>-query.sql**
  In this file, please submit the answers to question 3. The entire text file should be composed of **valid SQL statements**.

How to submit your assignment

1. Submit your assignment (the 2 text files described above) through the Web-base submission interface you have used to submit the previous assignments. **It is your responsibility to make sure the assignment was properly submitted.**.

2. Submit your assignment by the due date (8:00 PM , Feb. 19, 2020). There is no late submission.

Academic Honesty

The work in this assignment is to be done *independently*. Discussions with other students on the assignment should be limited to understanding the statement of the problem. Cheating in any way, including giving your work to someone else will result in an F for the course and a report to the appropriate University authority.