Assignment Three: JDBC[1]

Assignment four is to use jdbc and sql on agora using the Postgresql database system. You need to write Java programs that use jdbc to solve the following exercises from the end of Chapter 3 of our textbook. You need a separate Java program for each of the two exercises.

- Exercise 3.11: a-b. A tar file of psql batch files and data is provided on the course website for you to use to create the database schema for the university database and populate the relations.
  - For part 3.11 b) you can assume that a student who has not taken a course before Spring 2009 is the same as saying a student has not taken a course in a year < 2009.
- Exercise 3.12: a-d. After the sql for each of these exercises, use jdbc to print data from the database that demonstrates the sql for the exercise worked correctly. A tar file of psql batch files and data is provided on the course website for you to use to create the database schema for the university database and populate the relations.
  - For problem 3.12 a) modify it so that the new course is one credit hour, not zero credit hour. This is to avoid the constraint in the DDL that a course must have more than zero credit hours.
  - Problem 3.12 b) refers to Autumn 2009, but the correct term you need to use is Fall 2009.
  - For any of the parts of this problem, if information for one of the attributes is not provided for a new tuple, you can use the null value for that attribute.

Details

- A good first step is for you to get the example JDBC program that I provided to run in your account on agora. A common problem when you try to do this is java complaining that it cannot find the postgresql JDBC driver. I provide a copy of the postgresql JDBC driver in my account on agora. See the last section of Handout 4 (the section is named Using the Postgresql JDBC Driver) for how to modify your .bashrc file in your home directory on agora to create a CLASSPATH environment variable or modify your existing CLASSPATH environment variable so that the java interpreter will look at the path /home/kmorovat/lib/postgresql-42.2.2.jar to find the postgresql JDBC driver.
- Your solution must prompt the user for the username, database, and password to use. Use the readPassword() method of the Java.io.Console so that the password is not echoed. You cannot hard code that information for your account in your program since I will be testing it using my account. The readPassword() method returns a value of data type char []. However, you will use that value as part of a String value that you use in establishing the connection. Consequently, you first need to use newString() to turn the char [] value into a String value.
- When your program runs it must output sufficient information that the user is certain that your program worked correctly including
  - the problem statement for each problem part
  - for select statements, not only all the rows of the result set, but also the column names
  - for sql statements that modify a table, you must show the table both before and after the statement runs and print “Before” before the former table and “After” before the latter table and print the table name, the column names, and all the rows.
- Exercises 3.11 and 3.12 use the university database. I have provided a tar file of the batch files and data files to create and populate that database using psql. NOTE: You need to modify the database to add a

[1] Written by Dr. Mark Holliday

Chavez to delete.

- You can use the same statement object for every .executeQuery() method call.
- You need to use each of the following jdbc statements at least once in a substantive manner and in your README file you need to identify the location in your code of one use of each of these statements.
  - executeUpdate
  - executeQuery
  - prepareStatement
  - getMetaData

Documentation

You must javadoc your Java source files including your name, date, and description at the start of each file.

Besides the Java programs you need to include a README file that has

- your names, the date of your program,
- a substantive description of what your Java programs do,
- directions for what steps I need to take to test the your submission works correctly on my account on agora,
- where in your code you use each of the four kinds of jdbc statements listed below, and
- an identification of any bugs in your code.

Administrative

Your score on this assignment is based on well your files run on agora using postgresql on my account. I will run them as my username and database.

You can work in teams of one or two students. If you are in a team of two both of your names must be listed in the readme file. You can talk with people outside your team about the general concepts involved but they cannot help you and you cannot help them with how to answer the questions. Use handin on agora using the command

handin.453.1 3 assg3.tar

to turn in your assignment. If you are in the directory containing the assg4 directory as a subdirectory, then the command

tar cvf assg3.tar assg3

will create the assg4.tar file in the current directory. The tar file must contain your Java source files and your readme file.

The assignment is **due at 11:59 pm on Friday, the 7th of May**. No late assignments will be accepted.