Lab Assignment 4 **CMPS 180 - Fall 2016** **Due: 11:59pm Dec 4, 2016**

---

1. Preliminaries

First, download the file *lab4.zip* from Piazza. That file contains the schema and data for the database we will use for this lab, which are the same as the schema and data that we used in Lab3. The file also contains the PostgreSQL JDBC library, as well as other files, including the *SalesApplication.java* and *RunSalesApplication.java* files mentioned in later sections of this document.

The *create_lab4.sql* script will create all tables within the schema lab4, and *load_values_lab4.sql* will load data into those tables, just as for Lab3. Alter your search path to work with the tables without qualifying them with the schema name:

```
ALTER ROLE <username> SET SEARCH_PATH TO lab4;
```

You must log out and log back in for this to take effect. To verify your search path, use:

```
SHOW SEARCH_PATH;
```

Note: It is important that you do not change the names of the tables. Otherwise, your application may not pass our tests and you will not get any points for this assignment.

2. Instructions to compile and run JDBC code

Once you place all files of the lab4.zip file in your working folder, unzip the included jar file with the command:

```
> unzip postgresql-9.3-1103.jdbc3.jar
```

Modify *RunSalesApplication.java* with your own database credentials. Compile the Java code, and ensure it runs correctly. It will not do anything useful with the database yet, except for logging in and disconnecting, but it should execute without errors.

If you have changed your password for your database account with the "ALTER ROLE username WITH PASSWORD <new_password>;" command in the past, and you now use a sensitive password (e.g. the same password as your Blue or Gold UCSC password, or your personal e-mail password), make sure you do not include this into the *RunSalesApplication.java* file that you submit to us, as this information will be unencrypted.

You can compile the *RunSalesApplication.java* program with the following command:

```
> javac RunSalesApplication.java
```

To run the compiled file, issue the following command:

```
> java RunSalesApplication
```

Note that if you do not modify the username and password to match those of your PostgreSQL account in the program, the execution will return an authentication error.

If the program uses methods from the *SalesApplication* class and both programs are located in the same folder, any changes you do to *SalesApplication.java* will also be compiled with the javac command above.

You may get ClassNotFound exceptions if you attempt to run your programs locally and there is no JDBC driver on the classpath, or unsuitable driver errors if you already have a different version of JDBC locally that is incompatible with the class server cmps180-db.lt.ucsc.edu. To avoid such complications, we advise that you use the provided *postgresql-9.3-1103.jdbc3.jar* file that contains a compatible JDBC library.

3. Goal

The fourth lab project puts the database you have created to practical use. You will implement part of an application front-end to the database. A company employee might use this application.

4. Description

SalesApplication.java contains a skeleton for the *SalesApplication* class, whose two methods *getProductNamesWithTotalPriceLargerThan* and *addProduct*, interact with the database using JDBC. Each method is annotated with a description of what it is supposed to do in comments, and you task is to implement it to match that description. The default constructor is already implemented, and can remain empty if you do not wish to initialize any class variables.

A brief guide to using JDBC with PostgreSQL can be found here on the PostgreSQL site. This should be useful when implementing the methods.

5. Testing

RunStoreApplication.java contains sample code on how to set up the database connection and call application methods **for a different database and different queries**. Modify *RunSalesApplication.java* to your liking for testing purposes in a manner similar to the content of the *RunStoreApplication.java* program. You should write tests to ensure that your methods work as expected. In particular, you should write one test of the getProductNamesWithTotalPriceLargerThan method for a total price that you will choose, and two tests of the addProduct product method: one invocation of the addProduct method for a product that already exists in the database and one invocation of the addProduct method for a product that does not already exist.

6. Submitting

1. Remember to add comments to your Java code so that the intent is clear. If necessary, put any other information for the grader in a separate README file and include it in the submission.
2. Place the java programs on your working directory at unix.ucsc.edu.
3. Login to unix.ucsc.edu. At the shell prompt, submit your work with the following command:

   ```
   > submit cmps180-sf.f16 lab4 SalesApplication.java RunSalesApplication.java
   ```

   Do not submit the create and load scripts provided for you, or the jar file.

   You can submit more than once. Only your latest submission will be graded.