CS450 Spring 2023 Project 2

DUE: 04/21/2023 by 11:59PM

Project Description:

The goal of this assignment is to familiarize you with JDBC (Java Database Connectivity). We would like to create a command-line interface to access customers' transaction information. Write a Java program using JDBC to connect to your Oracle account, execute CustomerTransactions.sql script file provided with this project to create and insert data into your database, and implement a command-line interface to search the database.

Your database consists of the following tables:

Product (UPC, brand, product_name, product_description, category, marked_price, quantity_instock)
Customer (customer_ID, first_name, last_name, age, gender, zip_code)
Transactions (transaction_ID, customer_ID, transaction_date, payment_method, total)
Transaction_Contains (transaction_ID, UPC, quantity)

Foreign keys:
- Transactions (customer_ID) references Customer (customer_ID)
- Transaction_Contains (transaction_ID) references Transactions (transaction_ID)
- Transaction_Contains (UPC) references Product (UPC)

Your command-line interface should include the following functionalities.

1. The user can view the contents of each table. The user can select more than one table to view.
2. The user can search by customer_ID and return all attributes from Customer table and a total number of transactions field for each customer.
3. The user can search Product, Transactions, and Transaction_Contains tables by specifying one or more input attributes from {UPC, product_name, customer_ID, transaction_ID} and specify one or more output attributes from Product, Transactions, and Transaction_Contains tables. The user can add DISTINCT keyword to return distinct tuples in the result. Your search should consider pattern matching for product_name.
4. Your program should exit only when the user chooses to.

When your program starts, prompt the user for his/her Oracle username and password. **Please do not hard-code your own login information in the code.** After the program connects to the database successfully, prompt the user for the location of CustomerTransactions.sql script file when you create and insert data into the database from the script file. After the database is ready for search, print a menu like below and prompt the user to choose an option from the menu. If the user enters an option that is not valid, a message stating the option is invalid should be displayed and the menu is displayed again.

1. View table contents
2. Search by customer_ID
3. Search by one or more attributes
4. Exit

When the user chooses one of the options listed below:

1. prompt the user for each table like below:
   Product (Yes/No):
   Customer (Yes/No):
   Transactions (Yes/No):
   Transaction_Contains (Yes/No):
2. prompt the user for customer_ID
3. prompt the user for input fields, output fields, and distinct tuples or not like below:
   Input fields:
   UPC:
   product_name:
   customer_ID:
   transaction_ID:

   Output fields:
   UPC (Yes/No):
   brand (Yes/No):
   product_name (Yes/No):
   product_description (Yes/No):
   category (Yes/No):
   marked_price (Yes/No):
   quantity_instock (Yes/No):
   transaction_ID (Yes/No):
   customer_ID (Yes/No):
   transaction_date (Yes/No):
   payment_method (Yes/No):
   total (Yes/No):
   quantity (Yes/No):

   Distinct (Yes/No):
4. Exit the program

Each field in the output should be aligned (truncate to shorter strings when necessary) or each field is separated by commas. Print out an error message when no (valid) inputs are specified and prompt for inputs again. Print out a message when no results are found and go back to the main menu. After an option is executed, your program should go back to the main menu unless the user chooses option 4.

Extra credit: (10 Points)

Create a GUI interface or a web application at your choice and submit a demo video or give a demo to the GTA. Your interface should be user friendly and be able to achieve the same functionalities specified for the command-line interface above.

The deliverable:

Submit your source file(s) and the script/screenshot of running each option from the menu.

Tips:

The file Student.java includes Java commands for loading the necessary driver and connecting to Oracle database (Make changes to username and password). It will display the following information after it compiles and runs successfully:

```
jdbc:oracle:thin:@artemis.vsnet.gmu.edu:1521/vse18c.vsnet.gmu.edu
Connected.
Database Product Name: Oracle
Database Product Version: Oracle Database 18c Enterprise Edition
Release 18.0.0.0.0 - Production
Version 18.6.0.0.0
Database Driver Name: Oracle JDBC driver
Database Driver Version: 18.3.0.0.0
```

Resources:

1. Quick start with JDBC
   https://www.oracle.com/database/technologies/develop-java-apps-using-jdbc.html
2. JDBC Tutorial
   https://docs.oracle.com/javase/tutorial/jdbc/basics/index.html
3. Oracle JDBC FAQ
   https://www.oracle.com/database/technologies/faq-jdbc.html
4. Execute SQL script using JDBC
   https://www.tutorialspoint.com/how-to-run-sql-script-using-jdbc
   https://github.com/mybatis/mybatis-3/releases/tag/mybatis-3.5.7