Homework 7

CS430 and CS630

100 points

Due Date: **Wed, August 23, 2023, before 10:00 am**

INSTRUCTIONS (please read carefully):
Homework MUST be submitted electronically (copy files to the users.cs Unix machine) before the due date following these instructions:

- For **Question 1** problems create an SQL file named **Q1.sql** that will contain the answers (SQL statements).
- For **Question 2** create a Java file called **Q2.java**
- **The SQL and Java** MUST be copied on the users.cs Unix machine before the due date, using the following instructions: Create a folder 'HW7' under your main folder for the course (cs630), and place the .sql and.java files there. Ensure that the files are not readable by "others" (run for each filename the command chmod o-r filename) and that the files belong to the group CS630-1G and are readable by the group (run for each filename the command chmod g+r filename). DO NOT CHANGE PERMISSIONS FOR ANY OF THE DIRECTORIES (ESPECIALLY THE cs630 DIRECTORY IN YOUR HOMEDIR)!
- Students must have a cs unix account and must be enrolled in the cs630 class on the cs portal to be able to submit the homework.

No submission after the due date will be accepted. If any of the SQL or Java files from the cs Unix machine is uploaded or modified after the due date, that file will not be graded and the student will receive no credit. All submission must be electronical. No handwritten homework will be accepted.

All exercises are for both CS430 and CS630 students.

Important Notes:

- SQL statements must run against the Oracle database we use in class. (Please run and test your queries against the Oracle DB. Create the tables, insert some data, and test your queries!!!)
- SQL queries that do not run successfully against the Oracle DB will receive no credit.
- An SQL statement ends with a semicolon ;
- In the .sql file before each SQL statement you MUST include a comment line with the problem number the sql statement is for (e.g., before writing the SQL query for (c) add a comment line such as --Answer for c)). Remember that a comment line starts with two dash symbols. Any other additional comments can be written in comment lines.
- Java Code: up to 20% can be deducted for code formatting.
- Java code must be tested on the unix machine and run against the Oracle db. To run the Q2.java file you need to:

- Add the location of the ojdbc11.jar to the classpath using the command: export CLASSPATH=path/ojdbc11.jar , where path is replaced by the full path of the folder where this .jar file is located.
- Compile the file using the command: javac Q2.java
- Run the file using the command: java Q2.java

- Java file that does not run (i.e. it gives an error at compilation or at runtime) could receive at most 50% credit.

Question 1) (28 points)

Given the following db schema:

Movies(mid:integer, title:string, director:string, studio:string, releaseyear:integer)

Customers(cid:integer,name:string, city: string, state:string, age:real)

Watch(cid:integer,mid:integer,watchedon:date)

Primary keys are underlined in each relation. A movie is identified by an id (mid). It also has a title, director, studio and releaseyear.A customer is identified by cid. It also has a name, a city, state and age.Customers watch movies. When a customer watches a movie a record is inserted into Watch table, that will contain information about the ids as well as the date on which cid watched mid (attr. watchedon).

Notes:

- For both CS430 and CS630 students, each problem (a through g) carries 4 points possible.

For this schema:

a) Write the SQL statement to create the table Movies. Do not forget about the key constraints.
b) Write the SQL statement to create table Customers. Add the constraint that a customer must be at least 18 years old. Do not forget about the key constraints.
c) Write the SQL to create table Watch. Do not forget about the key constraints.
d) Write the SQL statement to create an index on column watchedon of table Watch. Name that index indexWatchDate.
e) Write the SQL statements to insert a record in table Movies, a record in table Customers, and a record in table Watch. The insert statements should be written in an order such that if executed in that order it will not cause an error.

f) Write the SQL statement to find the id and title of movies that were watched between Jan 1st 2022 and July 31st 2022 (including Jan 1st and July 31st). The result should contain no duplicates.

g) Write the SQL statement to extract the id and name of customers and the id, title and director of movies they watched, as well as the date on which they watched the movie (watchedon). Sort the result by watchedon in descending order.

Question 2) (72 points)

- **Java Code: up to 20% can be deducted for code formatting.**

(Note: this program uses the db tables created for Question 1)

Using the schema from Question 1, write a Java file that does the following:

- Reads from the input: an Oracle username, Oracle password, Oracle hostname, Oracle db name.
- Connects to the Oracle DB
- Runs a query against the database to extract all information about Customers. It prints the extracted information to screen.
- Runs a query against the database to extract the id and name of Customers and the id and title of Movies they watched as well as the date they watched the movies (watchedon attr.). It prints the extracted information to screen.
- Runs a query against the database to find out how many movies are in the db. It prints the result to screen.
- Runs a query against the Oracle db to extract the metadata for table Customers. It prints the result to screen.
- Prompts the username to enter a year. It returns the id, title and director of the movies that were released in that year.
- Closes the db connection. Prints a message and exits the program.