# Homework 4 CS430 and CS630 100 points

#### **INSTRUCTIONS:**

Submit your solutions through the cs630 course folder in your Unix account. No other way of submission will be accepted.

- Answers to all parts of question 1 and question 2 must be written and saved in files named Q1.sql and Q2.sql respectively. Please write your answers in the same order as the questions.
- Copy your solution files, Q1.sql and Q2.sql, to the cs630 course folder in your Unix account before the due date. You may copy and modify your solution files any number of times before the due date. Modifying your solution or copying new versions of them after the due date invalidates your submission and leaves you with zero credit.
- Follow the instructions, posted in Canvas (on the General discussion board), for copying your files and ensuring proper setting on them.
- No handwritten code/solution is accepted.

#### **Important Notes:**

- Test all your SQL code against the CS Oracle instance to ensure that your code executes properly and produces the expected results.
- End every SQL statement with a semicolon.
- In your SQL file, in a comment, specify the part number you are answering. Please answer the question in order. If you are skipping a part, leave the comment with the part that you are skipping. This helps us with grading your answers. Like this:

   Answer to part a

### Question 1 - 70 points

Consider the following DB schema.

Primary keys are underlined in each relation.

A book is uniquely identified by its id (bid). In addition to id, every book has the following attributes: name (bname), author (author), publication year (pubyear), and publishing company (pubcompany).

Authors are uniquely identified by their ids (aid). Authors also have these attributes: name (name), rating (rating), and state (state).

If an author wrote a book, a record will be present in the Writes relation, with the author's id (aid) and the id of the book they wrote (bid).

### Notes:

- Where order matters, you must write your statements in the correct order, such that if executes, they run without any issues.
- Each problem (a through n) has 5 points.

For each of the following, write the necessary SQL statement or statements. Some questions may require multiple statements.

- a) Create the three tables from the above schema. Do not forget about the key constraints.
- b) Extract all the Books whose *pubcompany* has a value.
- c) Extract all Books whose *pubcompany* has no value.
- d) Find the number of authors for each state and rating combination.
- e) Extract the name of the authors, along with the id and the name of every book they wrote, using INNER JOIN. You must use Inner Join.
- f) Join Authors with Writes. Write the statement such that authors who did not write any books also appear in the results.
- g) Insert a record into each of the three tables from the schema, in the correct order. Choose reasonable values for each of the fields.
- h) Set the name of the author, and *pubyear* of the book you inserted for part g, to different values. Pick any reasonable value you want.
- i) Set the *pubyear* of all books whose *pubcompany* is 'penguin' to 2000.
- j) Set the rating for all Authors to 10.
- k) Delete all authors who have not written any books.
- I) Add a new column called *age* of type *real* to the Authors table.
- m) Drop all tables.
- n) Create table Authors as defined previously with an addition of a constraint that only allows ratings between 1 and 5 (inclusive).

## Question 2 - 30 points

Take the following DB schema:

```
Cars(<u>carid: integer</u>, make: string, model: string,
    myear: integer, dailyfee: real)
Customers(<u>custid: integer</u>, name: string, city: string,
    state: string, dob: date)
Rents(<u>carid: integer</u>, custid: integer, rday: date)
```

Primary keys are underlines in each relation.

Cars are uniquely identified by their ids (carid). Each car also has a make (e.g. Toyota), a model (e.g. Corolla), a manufacturing year (myear), and a daily rental fee (dailyfee).

Customers are uniquely identified by their id (custid). Customers also have the following attributes: names, city, state and a date of birth (dob).

Customers rent cars. If a customer rented a car, a record would be present in the Rents table with the customer id (custid) and the car id (carid) that are rented by the customer. Attribute rday shows the date in which the car was rented.

For each of the following, write the necessary statement or statements. Some questions may require multiple statements. As always, for multi-statement question where the order matters, you must write them in correct order.

- a) Create the Cars table with the constraint that no car older than 2010 can be inserted in the table (i.e. manufacturing year not before 2010). Do not forget about the key constraints.
- b) Create the Customers table. Add the necessary constrains to disallow null values for any of its fields.
- c) Create the Rents table. Ensure that the day (rday) attribute is set for all rental records.
- d) Find the id and the name of all customers who rented all cars.
- e) Insert a record in the Cars table.
- f) Extract the id, make and model of all cars that were rented in 2022 (in any day) but were not rented in 2021.