Assignment 4

ENSF 608 Fall 2021

Department of Electrical and Software Engineering
Schulich School of Engineering

The objective of this assignment is to apply your understanding of relational algebra and database design theory.

Due: Friday, November 26th, 11:59 PM

Submission: This is an individual assignment. Your submission must be your own original work.

Please upload your solution as a single PDF file to the Assignment 4 Solutions D2L dropbox folder. The file should be named in the following format: Lastname_Firstname_Assignment4.pdf

Your solution may be handwritten or typed, and you may draw any diagrams by hand or by using software tools. Handwritten work may be scanned or clearly photographed. A suggested template has been provided on D2L.

Weighting: This assignment is out of 21 marks and is worth 12% of your overall grade.

Grading:

The query tree should follow the formatting conventions outlined in the lecture notes. Your solution may be computer generated or hand drawn but must be legible. All relational algebra expressions should use the notation outlined in the lecture notes. Marks will be deducted for incorrect or missing information. Solutions must be neat and organized.

Question Narrative
(repeated from Assignment 3)

You will be working with a database that summarizes the results of the archery events at the Tokyo 2020 Olympic Games. This data is adapted from the official results provided by the IOC. Only the top archery performers are included in the database. For more information, see https://olympics.com/en/olympic-games/tokyo-2020.

There are two types of registered participants: athletes and coaches. Each is assigned an Olympic ID number. When registering, athletes provide their year of birth, sex, and the first games that they competed in. Coaches do not provide the same information but must complete an orientation workshop. Their workshop completion is recorded as "Complete" or "Pending".

There are five events scheduled across five different days. All female participants are registered to compete in the "Women" individual event, all male participants are registered to compete in the "Men" individual event. Some countries have also entered teams in the three different team events ("Men's Team", "Women's Team", "Mixed Team"). Teams vary from 3 to 6 members.

Medal results are included for all individual and team events. Participants may earn bronze, silver, or gold. An additional table is used to summarize the total archery medals won by each country since the modern version of the sport began in 1972.

A file called `olympicarchery.sql` has been provided for your use in this assignment. Execute this file in MySQL Workbench to build and populate the schema.

QUESTIONS

Code the following queries using a single relational algebra expression. You do not need to list the data results of the query.

1. Write a query to retrieve the first and last names of each participant (1 mark).

2. Write a query to retrieve the Olympic ID number of all male athletes who first competed in the Rio 2016 games. (1 mark).

3. Write a query to retrieve the country, last name, and birth year of all athletes. (1 mark).

4. Write a query to retrieve the first name and country of each coach who has completed orientation (1 mark).

Code the following queries using a sequence of relational algebra expressions. You do not need to list the data results of the query.

5. Write a query to retrieve the first games in which the individual bronze medalists competed (3 marks).

6. Write a query to retrieve a list of the countries of all gold medal winners in this Olympics (you can assume that all team members are from the same country) (3 marks).

7. Write a query to retrieve a list of the countries that did **not** win any gold medals in this Olympics. You may use your intermediary results from Query #7 (3 marks).

8. Code the following query as either a sequence or single expression (4 marks), then draw the corresponding query tree (4 marks). You do not need to list the data results of the query.

Retrieve the birth years of all medal winners in the events held on July 30th and July 31st.