Assignment 4
ENSF 608 Winter 2023
Department of Electrical and Software Engineering
Schulich School of Engineering

Due : April 02, 2023 (11:59 PM)

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

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' D2L dropbox folder. The dropbox folder only accepts one pdf file and will always keep the latest uploaded file and discard the previous versions.
Your solution may be handwritten or typed, and you may draw your diagram by hand or by using software tools. Handwritten work may be scanned or photographed but must be legible to be graded.

Weighting: This assignment is out of 25 marks and is worth 12.5% 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

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.

PART 1 (5 marks)
Code the following query as either a sequence or single expression (1 mark), then draw the corresponding query tree (4 marks). You do not need to list the data results of the query.

- Retrieve the Olympic ID numbers and birth years of all medal winners in the events held at 'Dream Island Archery Field'.

PART 2 (20 marks)
Code the following queries as either a sequence or single expression relational algebra expressions. You do not need to list the data results of the query. Each question contains 2 marks.

1. Write a query to list all coach names (first and last), name of the country that they represent and the numbers of gold, silver, bronze medals won by that country.
2. Write a query to list the names of all countries that have won at least three medals in archery overall until 2010.
3. Write a query to count how many coaches belong to each country. Order your list with alphabetical order of country names.
4. Write a query to list the Olympic ID number, name (first and last), and birth year of all athletes. Order your list from youngest to oldest.
5. Write a query to list all athlete names (first and last)
6. Write a query to retrieve the first games in which the individual bronze medalists competed.
7. Write a query to list the team IDs of all teams that have at least one member who is participating in the Olympic Games for the first time.
8. Write a query to list the names of all countries that have more than two athletes and more than one coach from the same country listed in the database.
9. Write a query to list the names (first and last) and countries of any coaches who have not yet completed their orientation workshop.
10. Write a query to retrieve a list of the countries that did not win any gold medals in this Olympics.