



Assignment 4

ENSF 608 Fall 2023

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: Dropbox will remain open until Monday, November 27th at 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 18 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

(repeated from Assignment 3)

The directors of an annual music competition have decided to organize their participants using a database.

The competitors must be at least 5 years old and may be no older than 18. They are registered by their teacher, and all teachers belong to a studio. Guardian information is stored for each participant.

Competitors must perform an approved piece of music from the composition catalog. Each composition has a genre and may only be played for a competition category of the same genre.

Competitors are entered into a competition category. Each competition has an assigned date, time, genre, and minimum/maximum participation age. Performers earn a score out of 100 for each composition that they perform in a particular category.

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


Relational Algebra Queries (18)

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 name of each competitor (1 mark).
2. Write a query to retrieve the first and last name of all competitors under the age of twelve who play the oboe (1 mark).
3. Write a query to retrieve all competitor ID numbers and the name of the music studio that they belong to (1 mark).
4. Write a query to retrieve the first name and score earned by each competitor (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 titles of all compositions that will be performed during categories scheduled for the 1:00 PM timeslot (3 marks).
6. Write a query to retrieve the titles of all compositions that have not been selected by any performers (3 marks).



7. 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 a list of all score values that were earned by competitors belonging to the “Music Mastery” studio.