T-202-GAG1: Exercise 3

Readings

Ramakrishnan & Gehrke: Chapter 4 (except Section 4.3.2).

Preparation

As we will use the schema from Exercise 2, no preparation is needed other than reading and listening to the lectures. If you are not confident with the concepts, however, you may wish to finish the exercises selected from the book below first.

You are allowed to work in pairs but you should each hand in your work in Canvas. Just **document** who you worked with in you submission.

Exercise

You may work together, as in all exercises, and two students may submit together.

Write the following queries in relational algebra, tuple relational calculus, and SQL, as indicated for each query. Note that some of these queries would not yield any tuples with the current instance, but the queries should nevertheless be correctly formulated to work for every instance. The answer sets should be called R1 through R6.

1. *[RA, TRC, SQL]* The ID and name of all female athletes (gender description = 'Female').
2. *[RA, TRC, SQL]* The ID and name of all athletes who have participated in at least one tournament.
3. *[RA, TRC, SQL]* For each result, the name of the athlete (called "pname"), the name of the sport (called "sname"), and the percentage of the record achieved by the result (a result that is a record should therefore appear as 100; this column should be named "percentage").
4. *[RA, TRC]* The ID and name of all athletes who have *not* participated in any tournaments.
5. *[RA (*), TRC]* The ID of all athletes who have a *result* in all sports.
6. *[RA (*), TRC]* The ID of all athletes who have a *record* in all sports.

(*) For queries 5 and 6, you should write two relational algebra queries, one with the relational division operator and one without the relational division operator.

Deliverable

Submit a PDF file with the requested queries. The answers may well be handwritten and scanned, but should be clearly "formatted". You may also use the template provided to deliver the solution in Latex.

For Further Practice

Exercises 4.1, 4.3, 4.5 (omitting Domain Relational Calculus queries).

If you have more time, spend it to really understand relational division, including how to implement it with projection, cross product and set difference. You may also experiment with writing queries 4 through 6 in SQL.