

## Homework 5. Transition from RA to SQL

Before you begin this homework, please watch 2 introductory SQL lectures of Jennifer Widom:

- Introduction to SQL: <https://www.youtube.com/watch?v=wxFmiRwXcQY>
- Basic select statement: <https://www.youtube.com/watch?v=4IxiROdp6bw>

### Part 1. Queries on Movies dataset (submit through Markus as file HW5 . pdf)

Here is an all-familiar dataset about Movies.

**Movie** (title, year, length, inColor, studioName, producerC)

**MovieStar** (name, address, gender, birthdate)

**StarsIn** (movieTitle, movieYear, starName)

**MovieExec** (name, address, certN, netWorth)

**Studio** (name, address, presCertN)

You already have this set of tables implemented with PostgreSQL (see Homework 3). Now you can run `moviesdata.sql` to insert some basic data into your tables. Note that if some insertions violate the constraints you have set in Homework 3, you would need to disable these constraints for this exercise.

Translate following relational algebra queries into SQL and test your SQL against real Movies dataset. Explain in plain English what each query is computing (1 sentence), provide SQL statement and an output you obtained after you run your query.

1.  $\pi_{name} (\sigma_{title = 'Star wars'} (Movie) \bowtie_{producerC=certN} MovieExec)$
2.  $\pi_{title, name} (Movie \bowtie_{producerC=certN} MovieExec)$
3.  $\pi_{MovieStar.name, MovieExec.name} (\pi_{name, address} (MovieStar) \bowtie_{MovieStar.address=MovieExec.address \text{ AND } MovieStar.name \neq MovieExec.name} (\pi_{name, address} (MovieExec)))$
4.  $\pi_{name} ((\sigma_{title='Star wars'} (Movie)) \bowtie_{producerC \neq certN} (MovieExec))$

$$5. \pi_{\text{name}}[(\sigma_{\text{studioName}='Disney'}(\text{Movie})) \bowtie_{\text{producerC=certN}}(\text{MovieExec})] \\ \cap \pi_{\text{name}}[(\sigma_{\text{studioName}='MGM'}(\text{Movie})) \bowtie_{\text{producerC=certN}}(\text{MovieExec})]$$

$$6. \pi_{\text{title}}(\text{Movie}) - \pi_{\text{title}}((\text{Movie}) \bowtie_{\text{producerC=certN}}(\text{MovieExec}))$$

$$7. (\rho_{S1(\text{title1,year1,name1})}(\text{StarsIn})) \bowtie_{\text{name1=name2 AND (title1 != title2 or year1 != year2)}} (\rho_{S2(\text{title2,year2,name2})}(\text{StarsIn}))$$

## Part 2. PCRS exercises

The second part of this homework is on PCRS: <https://teach.cdf.toronto.edu/343/content/quests>

This is the first time we are using PCRS for this course, so if you encounter any problems please let me know right away.

There are total 7 Movies queries (7 points), 8 Countries queries (8 points), and 9 pizza queries (9 points), for a total of 24 points which still give you only 1% of the course grade, but you become proficient with SQL, which is the main topic of assignment 2.