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**CptS 451 – Introduction to Database Systems**

**Homework-3 - Relational Algebra**

1. Find the meetings which are hosted by the instructor of `CptS 321’ (i.e., hosted by the instructor who teaches ‘CptS 321’). Return the meeting title and the course\_id for the meeting, and instructor’s first and last names. Order the results by meeting course\_id and meeting title.
   1. Relational algebra tree:

Diagram

Description automatically generated

* 1. Expression and Output:

Table

Description automatically generated

1. Find the student users who did not post any messages. Return the student\_id, email, firstname and lastname of those students.
   1. Relational algebra tree:

Diagram

Description automatically generated

* 1. Expression and Output:

Table

Description automatically generated

1. Find the instructors who work in the “Machine Learning” field but are not teaching any courses. Return the instructor\_id, first name, and lastname of those.
   1. Relational algebra tree:
   2. Expression and Output:
2. Find the pair of messages that are posted at the same meeting and at the same time but by different users. Return the common meeting\_id and message\_time of the two messages as well as the message\_text and user\_id of each message.
   1. Relational algebra tree:
   2. Expression and Output:
3. Find the users who are mentioned 2 or more times in the messages of CptS451 meetings. (‘CptS451’ is the id of the course associated with the meetings; assume we consider all meetings of ‘CptS451’.) Return the user\_id, email, first and lastname of the user mentioned and the number of times they are mentioned.
   1. Relational algebra tree:
   2. Expression and Output:
4. Find the instructors who hosted more than 3 meetings that are associated with the same course. Return the course\_id, number of meetings, and the first and last name of the instructor.
   1. Relational algebra tree:
   2. Expression and Output:
5. Find the ‘CptS451’ students who didn’t attend a meeting of the ‘CptS451’ course, but they watched that meeting’s recording. Return the student\_id, meeting’s title, and recording\_number of the recording student watched.
   1. Relational algebra tree:
   2. Expression and Output:
6. Find the meetings for which the number of messages posted by instructors is greater than the number of messages posted by students. Return the meeting\_id, number of messages by instructors, and the number of messages by students for those meetings.
   1. Relational algebra tree:
   2. Expression and Output:
7. Find the longest meeting(s) (i.e., the meetings with max duration). Return the meeting\_id, title and duration of those meeting(s).
   1. Relational algebra tree:
   2. Expression and Output:
8. Find the meeting(s) with the most number of attendees. Return the meeting title and the number of attendees for those meeting(s).
   1. Relational algebra tree:
   2. Expression and Output: