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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:

Graphical user interface, diagram, funnel chart

Description automatically generated

* 1. Expression and Output:

Graphical user interface, text, application, email

Description automatically generated

1. 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: