

Homework #4

(90 points)

Due Date: April 6th, 2023, at the beginning of class

Directions

1. **This is an INDIVIDUAL assignment; do your own work! Submitting answers created by other people is NOT doing your own work.**
2. Start early! Getting help is much easier n days before the due date/time than n hours before.
3. Write complete answers to each of the following questions, in accordance with the given directions. Create your solutions as a PDF document such that each question is on a separate page; all parts of a multi-part question may be on the same page. Show your work, when appropriate, for possible partial credit.
4. Questions of the form “ $\alpha.\beta$ ” are found in the Connolly/Begg text, available via D2L, as question β at the end of chapter α . For questions with sub-parts, note that a notation of “(w,z)” is asking you to complete parts w and z only, not parts x and y.
5. If you have questions about any aspect of this assignment, help is available from the class staff via piazza.com and our office hours.
6. When your answers are ready to be turned in, do so on gradescope.com. Be sure to assign pages to problems after you upload your PDF. Need help? Visit <https://help.gradescope.com/> and search for “Submitting an Assignment.”
7. Remember that you can use at most one late day on a homework assignment, because we will be distributing solutions after that time.

Relational Calculi and Algebra

1. (5 points) 5.7. Answer using DRC, using the DRC syntax I use in class.
2. (15 points) 5.12(b,f). Answer using our in-class CSc 460 syntaxes (not the book’s, and not LEAP’s).
3. (10 points) 5.16. Again, use our syntaxes.

SQL Queries

4. (5 points) 6.11.
5. (5 points) 6.13.
6. (5 points) 6.21.
7. (5 points) 6.23.

(Continued ...)

SQL DDL

8. (5 points) 7.5.
9. (5 points) 7.7.
10. (10 points) 7.11 (a,c,e). Only create Room and Booking, and consult the book's coverage of constraint features to learn about details we did not cover in class.
11. (5 points) 7.14. Include guest names, addresses, room numbers, room types, room prices, and booking dates.

SQL Triggers

12. (5 points) 8.6.
13. (5 points) 8.11 (a).

Functional Dependencies

14. (5 points) Consider this schema: $R(H, I, J, K, L, M, N)$. Also consider the FDs $I \rightarrow HJKL$ and $L \rightarrow MN$. Compute both I^+ and N^+ .
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Minimal Cover *practice* question; this is not a homework question!

We won't cover minimal covers of FDs in time for graded questions about it to appear on this homework, but I can give you one to try for practice after we have covered that sub-topic. All of Topic 12 (Functional Dependencies) will be 'fair game' for Exam #2.

- Given the set of FDs $F = \{A \rightarrow D, AC \rightarrow B, C \rightarrow D, A \rightarrow BC\}$, find a minimal cover of F .