

## CS 122A: Introduction to Data Management – Fall 2020

### Homework 4: Relational Algebra (100 points)

**Due Date:** Friday, Nov 6 (4:00 PM PDT)

#### Submission

All HW assignments should contain both your student ID and your name and must be submitted online via the HW4 dropbox on **Gradescope**. See the table below for the HW 4 submission opportunities. Note that after 4 PM on Saturday the 7<sup>th</sup> no further HW 4 submissions will be accepted. (We will be releasing the solution at that time.) Please strive to get all your work in on time! If possible, try to save the one dropped assignment for the end of the term when you are most likely to want/need it.

Date / Time	Grade Implications
Friday, Nov 6 (4:00 PM)	Full credit will be available
Saturday, Nov 7 (4:00 PM)	10 points will be deducted

#### Relational Algebra [100 pts]

Congratulations! CheckedTweets.org has officially launched its business; the web site is up and running and starting to attract usage. As expected, your database design is working well so far! Now it's time to search and analyze the data using the Relational Algebra.

#### Schema, Data, and Tools

CheckedTweets.org is currently using the relations from HW 2 (with the exception of RawTweets). You can refer to the provided solution to remind yourself of their schemas. You will also be able to see the relations' schemas in your browser when you're using the online relational algebra executor for this assignment. A small sample data set will be provided for you to use in testing your queries. More information about how to load the schema and associated sample data – and how to enter and run queries – can be found in the RelaX instructions linked from HW 4's entry on the course wiki page. You are required to use the online tool for this assignment.

For this HW, write the following queries in the relational algebra against the CheckedTweets.org test relations. Show both the parse tree and the actual result of each query that you wrote where requested to do so. We suggest that you write your relational algebra expressions on paper first before attempting to execute them on the Relational Algebra Calculator site. Please note that you will not get *any* points for giving the result of a query on this assignment if your relational algebra expression is not syntactically correct (!). Since you have a “live” algebra interpreter at your disposal, this should not be an issue – you will be testing all of your queries that way.

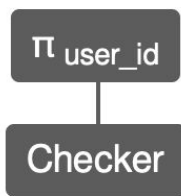
As an example, we have included a sample question and its answer below. Please note that we expect you to use the parse tree generated from the Relational Algebra Calculator site.

Question: Print user\_id of all checkers

**a) [6pts] Relational algebra**

$\pi$  user\_id (Checker)

**b) [1pt] Parse Tree**



**c) [3pts] Result**

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Checker.user\_id

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0

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3

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5

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6

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7

Be sure to download the HW#4 template file from the Attachments area of the CS122a web page and use that as the basis for your submission, as it is mandatory.