CS 122A: Introduction to Data Management – Fall 2021

Homework 7: SQL Design and Indexing (100 points)

Due Date: **Monday, Nov 22 (6:00 PM)**

Submission

All HW assignments should contain both your student ID and your name and must be submitted online via the HW7 dropbox on Gradescope. See the table below for the HW 7 submission opportunities. Note that after 6 PM on Tuesday the 23rd no further HW 7 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**
Monday, Nov 22 (6:00 PM)	Full credit will be available
Tuesday, Nov 23 (6:00 PM)	10 points will be deducted

SQL Design and Indexing (SQL) [100 pts]

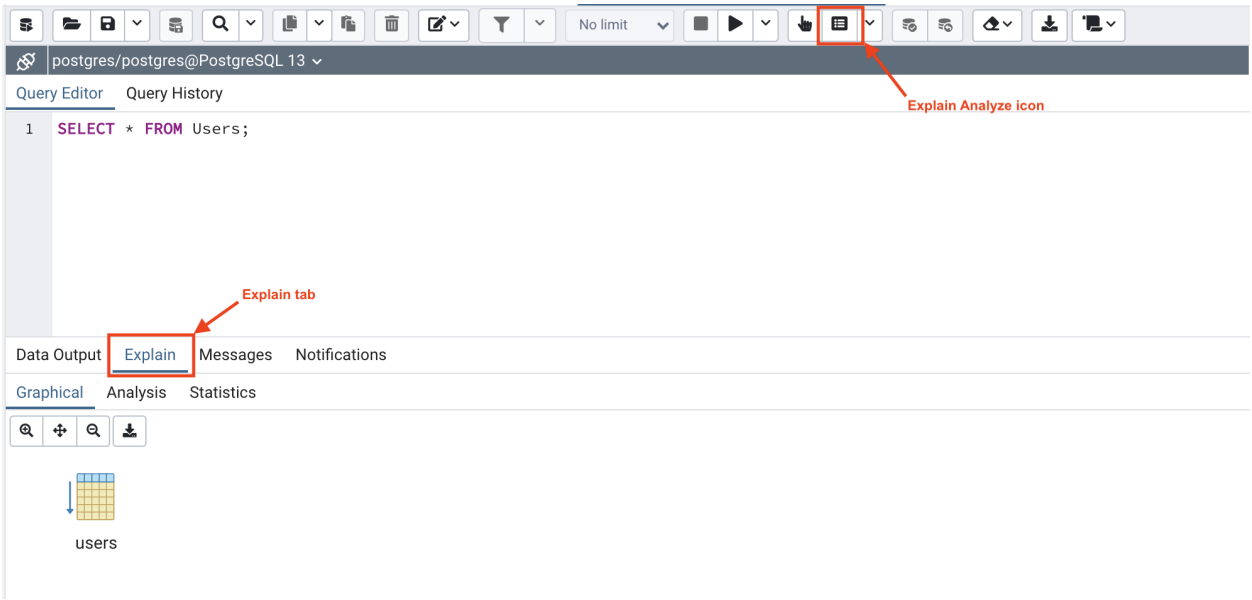
A physical query plan is like a routine (or a relational algebra expression) that the DBMS follows to assemble the requested query results from the underlying base tables. Different queries will have different physical plans. In fact, the same query may be translated into different physical plans depending on the physical database design. PostgreSQL's PgAdmin provides an 'EXPLAIN' function, as shown in the figure below, to help you to check the query plan of your query. You can use this function to examine how your query will be executed internally, what indexes are being used, and the total cost of your query.

Since our application is getting larger, simple queries are now taking too long to execute. The CTO of SWOOSH is asking the database design team to compile a report about the performance of the system and provide solutions to improve the performance of the SWOOSH application. Since you have taken CS122A, you are more than capable of taking care of that report and presenting it to the CTO on time. (Or up to one day late with a 10% salary reduction. :-))

Notes:

1. For this assignment, you can turn in a PDF by cutting/pasting from PgAdmin into a copy of the HW7 template and then **PDF-printing** the results.
2. We are using the same datasets used in HW6.
3. To use the explain function, write out the query in the Query Tool, select the "Explain" tab instead of "Data Output", then select the "Explain Analyze" icon on the top right of the options

bar (see below).



4. To display more information about the query plan (other than the nice graphics!), click on the table diagram and a window on the right will pop up with additional details, like below: