Homework 3

(End of lecture 5)
MLLO 20180426

Homework 3 (Due 5/10)

Based on the ER model and relational database you built in Homework 1 and 2 , we design SQL statements to extract useful or interesting information in this homework.   We will use 'MySQL Command line client - Unicode'. For your homework, please design:

Basic select — Write a SELECT statement on one table that contains three or more conditions connected by AND, OR, and NOT comparison operators. You must use AND, OR, NOT each at least once.

Basic projection — Write a SELECT statement on one table to show the effect of projection (show less attributes than there are attributes in the table.)

Basic Rename — Write a SELECT statement that selects some tuples from a table, and uses rename to make the names for all the attributes easier to read.

UNION
- Write a statement to demonstrate the UNION operation between two tables in your database. If your database do not already have two tables that are union-compatible, you need to create a new table so that you have two union-compatible tables. If that's the case, you need submit your CREATE TABLE statement for the new table along with your UNION statement.

Equijoin — Write a SELECT statement that performs an equijoin between two tables.

Natural join — Write a SELECT statement that performs a natural join between two tables.

Theta join — Write a SELECT statement that performs a theta join between two tables which is not a equijoin.

- Hint: for the last 3 problems, you need clearly understand the definition of equijoin, natural join and theta join.

Homework 3 (2)

Three table join

- Write a SELECT statement that performs joins among three tables

Aggregate

Write a SELECT statement that demonstrates aggregate functionality by using GROUP BY and MAX, MIN, and COUNT

Aggregate 2

Write a SELECT statement that demonstrates aggregate functionality by using GROUP BY and AVG, SUM, and COUNT

IN

Write a SELECT statement that uses IN operator and explicit set value

IN 2

Write a SELECT statement that uses IN operator and dynamic set value

Correlated nested query

Write a SELECT statement that implements a correlated nested query using the IN operator

Correlated nested query 2

Write a SELECT statement that implements a correlated nested query using the EXIST operator

5% bonus 1

Write a SELECT statement that implement a left outer join in MySQL.

5% bonus 2

Write a SELECT statement that implement a full outer join in MySQL.

5% bonus 3

Write a SELECT statement that demonstrate the aggregate functionality and uses the HAVING clause.

5% bonus 4

Write a SELECT statement that implement correlated nested query using the NOT EXIST operator

Homework 3 (3)

- Note:
  - For you to get points for each problem in this homework, you need to make sure the result of each of your SQL statement is not an empty relation. For this, you may need to insert additional rows into your table. You do not need to show these insert statements in your homework submission. Just insert the necessary row to ensure that none of your statement result is empty.
  - If one of your SQL statement returns an empty relation, you will not get points for that problem, even if the syntax of your SQL statement is correct.

- Hint:
  - For your get good points for this homework, the best way is to ensure you fully understand the definitions of all related SQL operators, clauses, and commands before you start to solve each of your homework problems.

General Rules for the Homework

- Rules for the homework, and the points to be deducted for each rule violated.
- Delivery method (up to -10% if violate)
    - Output your homework answers to a file.
    - Name your file with your student ID. For example, if you student ID is r01234567, you should name your file "r01234567.log"
    - Compress your homework file into zip file (without directory structure), and submit the zip file as your homework submission.
- Homework file content:
    - You also need to keep a table "self" in your database, which contains your name, student ID, department and year. This table will be used to identify yourself in your homework

- To generate output into your homework file, use "MySQL Command line client - unicode"
- (Use "tee" command to start the output session, "notree" command to stop)
- Type (up to -10% if violate)
    - Tee "output file path"
    - Select * from self;
    - Select database();
- For each of the problems in the homework set (lose the points for the problem if fail to conform.)
    - Type a comment with the title of the problem
    - Type each of your corresponding SQL statement
    - Type no extra commands or text
- End the output session by typing:
    - Notee

General Rules for the Homework (2)

- Each error message (as generated by DBMS) in your homework file will result in -5%.
  - An error message means you have not fully grasped the related topic.
  - You should test your SQL statements repeatedly, till you get rid of all error messages, before you start to "TEE" your SQL statements into your homework submission file.
- Manually editing your homework submission file is forbidden. Especially, editing the homework file to get rid of error messages is considered cheating, and will results in you losing the points for the corresponding problem, or worse!

Hint:

- What you create in this homework may continue to be used by yourself in the future homeworks.

Other rules:

- Submit before the end of first break of the class on the due date.
- Late submission: 80% discount for each day late.
- Maximum two day delay (No acceptance on the third day counting from the submission date.)

TA Grading Guidelines

- 5%   Basic select
- 5%   Basic projection
- 5%   Basic Rename
- 5%   UNION
- 10%   Equijoin
- 10%   Natural join
- 10%   Theta join / Three table join
- 10%
- 5%   Aggregate
- 5%   Aggregate 2
- 5%   IN
- 5%   IN 2

- 10%   Correlated nested query
- 10%   Correlated nested query 2
- Total 100%
- 5%   5% bonus 1
- 5%   5% bonus 2
- 5%   5% bonus 3
- 5%   5% bonus 4
- Total 120%