CSE 111 – DATABASE SYSTEMS
Lab 9

In this lab session you will learn how to work with `SQL` views. You will create views based on queries from Lab 4 and rewrite the same queries with the views. You will do all these in a `Java` or `Python` application, for which we provide skeleton code (`Lab_9.java`) and `Python` (`Lab_9.py`). While you have the freedom to choose which programming language you use, you have to completely implement the lab in one of the two languages.

The tasks you have to implement are the following:

1. Create a view *V1(c_custkey, c_name, c_address, c_phone, c_acctbal, c_mktsegment, c_comment, c_nation, c_region)* that appends the country and region name to every customer. Rewrite `Q1` from Lab 4 with view `V1`.
2. Create a view *V2(o_orderkey, o_custkey, o_orderstatus, o_totalprice, o_orderyear, o_orderpriority, o_clerk, o_shippriority, o_comment)* that replaces `o_orderdate` with the year `o_orderyear` and contains all the other attributes in `orders`. Rewrite `Q2` from Lab 4 with views `V1` and `V2`.
3. Rewrite `Q3` from Lab 4 with view `V1`.
4. Create a view *V4(s_suppkey, s_name, s_address, s_phone, s_acctbal, s_comment, s_nation, s_region)* that appends the country and region name to every supplier. Rewrite `Q4` from Lab 4 with view `V4`.
5. Rewrite `Q5` from Lab 4 with view `V4`.
6. Rewrite `Q6` from Lab 4 with views `V2`.
7. Rewrite `Q7` from Lab 4 with views `V1` and `V2`.
8. Rewrite `Q8` from Lab 4 with views `V2` and `V4`.
9. Rewrite `Q9` from Lab 4 with views `V2` and `V4`.
10. Create a view *V10(p_type, min_discount, max_discount)* that computes the minimum and maximum discount for every type of part. Rewrite `Q10` from Lab 4 with view `V10`.
11. Create two views *V111(c_custkey, c_name, c_nationkey, c_acctbal)* and *V112(s_suppkey, s_name, s_nationkey, s_acctbal)* that contain the customers with negative balance and the suppliers with positive balance, respectively. Rewrite `Q11` from Lab 4 with views `V111` and `V112`.
12. Rewrite `Q12` from Lab 4 with view `V4`.
13. Rewrite `Q13` from Lab 4 with views `V1` and `V4`.
14. Rewrite `Q14` from Lab 4 with views `V1` and `V4`.
15. Rewrite `Q15` from Lab 4 with view `V4`.

In order to complete the lab you have to perform the following tasks:

1. Write the `Java` code that implements the required functionality in the corresponding methods in file `Lab_9.java`. If you use `Python`, you edit the file `Lab_9.py`. This is the only file you have to edit. Moreover, you have to write code only in the specified methods/functions. There are 21 such methods/functions overall.
2. For your reference, we provide you the `SQL` statements for all the queries in Lab 4 in file `queries-lab-4.sql`.
3. The format of the expected output for every query is available in `output/x.out`.

4. You can run your code by executing the command `./test.sh` in the terminal. You have to be in the main lab folder. The output produced by your code is generated in `output/x.out`. `./test.sh` runs the `Python` code. If you use `Java`, uncomment the `Java` part and comment the `Python` part.

5. You have to submit only the `Lab_9.java` or `Lab_9.py` file, whichever you write your code in.