National University of Sciences and Technology (NUST)
School of Electrical Engineering and Computer Science

Department of Computing

CS-220: Database Systems

Class: BSCS-6C

Lab10 – Views in SQL

Date: 23 Nov. 2017

Time: 09:00am-12:00 pm

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Querying Relational Database

Introduction

Structured Query Language (SQL) is a high level query language which has inbuilt operators and functions for different presentation/manipulation of the data that is retrieved.

Objectives

After performing this lab students should be able to:

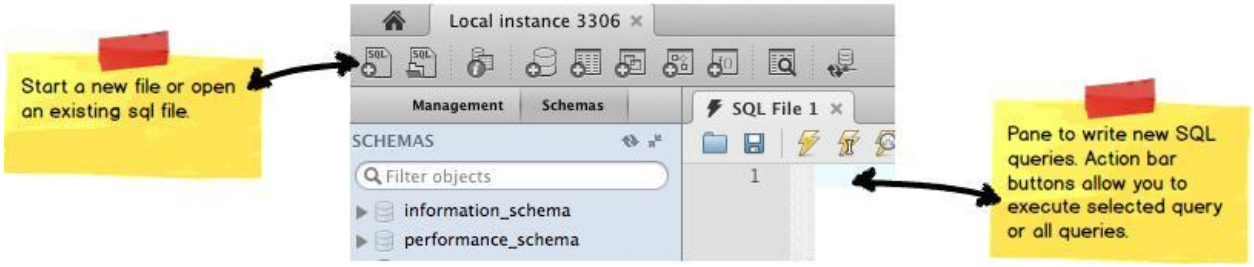
1. Design SQL queries to retrieve data using SELECT clause and using logical operators.
2. Explore various inbuilt single row functions of SQL.

Tools/Software Requirement

- MySQL Community Server 5.6
- MySQL Workbench 6.1
- Sakila Database

Description

1. Open MySQL Workbench and open the default connection instance.
2. A new query window would open from where you can write and execute queries.



3. You can save the query file and can also add comments using //, /* */ symbols.
4. On executing queries, results are displayed in the lower part of the screen.
5. Error or success messages are displayed in action output pane at the bottom.
6. Continue playing with the Workbench and SQL queries till you are comfortable with the querying mechanism and have learnt the shortcuts to execute queries.

This lab is about querying databases. This lab will cover SQL views and its queries.

Description of Views in SQL

```
CREATE
    [OR REPLACE]
    [ALGORITHM = {UNDEFINED | MERGE | TEMPTABLE}]
    [DEFINER = { user | CURRENT_USER }]
    [SQL SECURITY { DEFINER | INVOKER }]
    VIEW view_name [(column_list)]
    AS select_statement
    [WITH [CASCADED | LOCAL] CHECK OPTION]
```

The CREATE VIEW statement creates a new view, or replaces an existing view if the OR REPLACE clause is given. If the view does not exist, CREATE OR REPLACE VIEW is the same as CREATE VIEW. If the view does exist, CREATE OR REPLACE VIEW is the same as ALTER VIEW. Further details of the Syntax can be explored on MYSQL website.

A view belongs to a database. By default, a new view is created in the default database. To create the view explicitly in a given database, `use db_name.view_name` syntax to qualify the view name with the database name:

```
CREATE VIEW test.v AS SELECT * FROM t;
```

Unqualified table or view names in the SELECT statement are also interpreted with respect to the default database. A view can refer to tables or views in other databases by qualifying the table or view name with the appropriate database name.

Within a database, base tables and views share the same namespace, so a base table and a view cannot have the same name.

Columns retrieved by the SELECT statement can be simple references to table columns, or expressions that use functions, constant values, operators, and so forth.

A view must have unique column names with no duplicates, just like a base table. By default, the names of the columns retrieved by the SELECT statement are used for the view column names. To define explicit names for the view columns, specify the optional column_list clause as a list of comma-separated identifiers. The number of names in column_list must be the same as the number of columns retrieved by the SELECT statement.

LAB TASKS

Given the following database schema:

Student (snum: integer, sname: char(30), major: char(25), level: char(2), age: integer)

Faculty (fid: integer, fname: char(30), deptid: integer)

Class (cname: char(40), meets_at: char(20), room: char(10), fid: integer | fid REFS Faculty.fid)

Enrolled (snum: integer, cname: char(40) | snum REFS student.snum, cname REFS class.name)

Write SQL expressions for each of the following create view queries and then use the view in other queries for executing them:

1. Create a view named “CSstudents” that retrieve all students whose major is “Computer Science”.
    a. Retrieve age of the oldest student whose major is “Compter Science”.
    b. Find the name and age of the oldest student whose major = “Computer Science”
    c. Find the names, majors and ages of all juniors (Level = JR) who are enrolled in a class taught by Ivana Teach in “Computer Science” major.
    d. Find the names of faculty members and their departments, classes and room number which they teaching in “Computer Science” major..
2. Define a view “ElderStudents” that retrieve oldest students in each major.
    a. Find the names of classes and their rooms where elder students are studying.
    b. Find name of major and age of student who includes the eldest student.
3. Define a view “EnrolledStudents” that retrieve students who are enrolled for a class.
4. Find the names of all students who are enrolled in two classes that meet at the same time.
5. Redefine the above query with “EnrolledStudents”.

Deliverable

Submit a PDF document including the SQL queries to answer above-mentioned information needs as well as snapshot of their outcome when executed over MySQL using the Workbench.