# Department of Computing

**CS220: Database Systems**

**Class: BSCS-6C**

**Lab 07: Nested Queries of SQL**

**Date: Nov. 2, 2017**

**Time: 0900-1200**

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# Introduction

* SQL DDL (Data Definition Language) commands are used to create and modify the databases. Data Manipulation Language (DML) commands are used to query the databases.

# Objectives

After performing this lab students should be able to:

1. Create tables in SQL using DDL commands.

2. Perform DML operations on created tables.

# Tools/Software Requirement

* MySQL Community Server 5.6
* MySQL Workbench 6.1

# Description

**Nested Queries/Subqueries**

A nestested/subquery is a SQL query nested inside a larger query, such inner-outer queries are called nested queries

A subquery may occur in:

* A SELECT clause
* A FROM clause
* A WHERE clause

**Rule of thumb**: avoid writing nested queries when possible; keep in mind that sometimes it’s impossible

**Nested queries**

* can return a single constant and this constant can be compared with another value in a WHERE clause
* Can return relations that can be used in various ways in WHERE clauses
* Can appear in FROM clauses, followed by a tuple variable that represents the tuples in the result of the subquery
* Can appear as computed values in a SELECT clause

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)

1. **Find the name of faculty members who do not teach any course**.

select distinct f.fname

from faculty f

where f.fid not in

(select c.fid from class c);

1. **Find the names of students who are enrolled in a course taught by I. Teach**.

Select s. snames

From student s

where S.snum in

(Select E.snum

From class C, enrolled E, faculty F

Where E.cname = C. cname and C.fid = F.fid

and f.fname = 'I. Teach')

1. **Find the names of all students who are enrolled in two classes that meet at the same time**.

select distinct S.sname

from student S

Where S.snum in

(select E1.snum

from enrolled E1, enrolled E2, class C1, class C2

where E1.snum = E2.snum and E1.cname <> E2.cname

and E1.cname = C1.cname

and E2.cname = C2.cname and C1.meets\_at = C2.meets\_at)

# Lab Task

**Write Nested SQL expressions for each of the following queries and execute them:**

1. Find the names of all juniors (Level = JR) who are enrolled in a class taught by ‘Ivana Teach’.
2. Find the names of faculty members that has taught classes only in room R128.
3. Find the names of classes taught by ‘Richard Jackson’ and their times when a class meet there.
4. Display the names of classes whose students strength is greater than 10.
5. Find the names of classes taught by ‘John Williams’ in dept # 68.
6. For each class taught by ‘John Williams’, retrieve the name and age for students.
7. Display the faculty names who teach maximum number of classes.
8. Display the name and dept id of faculty members that do not teach to class ‘database
9. Find the name of students enrolled in ‘Data Structures’ and “Database Systems”.
10. List the name of ‘Christopher Garcia’s teachers.
11. Retrieve the snum and sname of students who have taken classes from both ‘Ivana Teach’ and ‘Linda Davis’. (Both with simple and nested queries)

**Note:** SQL queries must be in Nested form.

# Deliverables

1. Complete your lab tasks in SQL workbench and submit a word file in with queries along with the screenshots of the results to all the questions attempted. Upload it on LMS. The marking will be based on viva/lab task submitted.