



Advanced SQL Queries Lab

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Outline

- Entrance Test
- Problem Statement
- Create a Table by Script
- Tasks 1-9 + bonus (10th)
- Information for Laboratory Reports



Problem Statement

In this Lab Exercise you will construct a number of SQL queries for the given database. The purpose of this lab is to become familiar with advanced SQL queries on multiple tables. You will write basic SQL queries as well as more complex ones by using aggregate functions on joined tables and obtaining summary data.



Create Tables

- Use *Lab3-CreateTables.sql* script to create tables you will work with during the lab. You can use the existing database (e.g. the one you have created on Labs 1 or 2) or create a new one.
- Run the script. Check that all tables have been created correctly and filled with data. Check the types and the constraints.



Task 1

- Find the names of all Juniors (level = JR) who are enrolled in a class taught by I. Teach

	Sname
1	Christopher Garcia
2	Paul Hall



Task 2

- Find the age of the oldest student who is either a History major or enrolled in a course taught by I. Teach. Rename the resulting column to “Max Age”.
 - As the '*fname*' column of Faculty contains full names, you should take it into account when designing your query

	Max Age
1	20



Task 3

- Find the names of all classes that either meet in room R128 or have five or more students enrolled.

	name
1	Dairy Herd Management
2	Data Structures
3	Database Systems
4	History of the Choson Dynasty
5	Intoduction to Math
6	Operating System Design
7	Patent Law



Task 4

- Find the names of all students who are enrolled in two different classes that meet at the same time
- The resulting set should be empty. Usually, it is not allowed to enroll in two parallel classes, hence you will be unable to attend both at the same time.



Task 5

- Find the names of faculty members who teach in every room some class is taught
 - Please note that there is a difference between vendor-specific SQLs. If you solve this task with Transact-SQL (MS SQL Server), then you will use the keyword **EXCEPT**. However, in PL\SQL (Oracle) the corresponding keyword would be **MINUS**.

	fname
1	Richard Jackson



Task 6

- Find the names of faculty members for whom the combined enrollment of the courses that they teach is less than five

	fname
1	Barbara Wilson
2	David Anderson
3	Elizabeth Taylor
4	James Smith
5	Jennifer Thomas
6	John Williams
7	Mary Johnson
8	Michael Miller
9	Patricia Jones
10	Richard Jackson
11	Robert Brown
12	Ulysses Teach
13	William Moore



Task 7

- For each level, print the level and the average age of students for that level

	standing	(No column name)
1	FR	17
2	JR	19
3	SO	18
4	SR	20

- For all levels except JR print the level and the average age of students for that level

	standing	(No column name)
1	FR	17
2	SO	18
3	SR	20



Task 8

- Find the names of students enrolled in the maximum number of classes. Rename the resulting column to “Hard-working students”

	Hard-working students
1	Ana Lopez
2	Juan Rodriguez



Task 9

- Find the names of students not enrolled in any class. Rename the resulting column to “Lazy students”

	Lazy students
1	Angela Martinez
2	Charles Harris
3	Daniel Lee
4	Donald King
5	Dorothy Lewis
6	Edward Baker
7	George Wright
8	Margaret Clark
9	Maria White
10	Mark Young
11	Nancy Allen
12	Steven Green
13	Thomas Robinson



Task 10 (bonus)

- For each age value that appears in Student, find the level value that appears most often.
 - For example, if there are more FR level students aged 18 than SR, JR or SO students aged 18, you should print the pair (18, FR).

	age	standing
1	17	FR
2	18	FR
3	19	SO
4	20	JR
5	21	SR
6	22	SR



Modifying database, writing queries

Follow the instructions of the Lab Instructor.



Information for Laboratory Reports

- *Lab title:* “Advanced SQL Queries”
- *Instructor:* Dmitriy Dunaev
- *Department:* Automation & Applied Informatics
- *Lab sequence number:* 3