Databases Laboratory 1: Basic SQL statements

DS4001, Halmstad University

January 21, 2025

Introduction

The objective of this lab is to practice your skills in SQL queries. You will practice Data Definition Language (DDL) and Data Manipulation Language (DML) for

- creating a database with multiple tables, and inserting a few entries, according to the given information;
- querying data from several different Databases.

In addition, you will explore a real-world dataset on movies in task 3, using SQL queries.

Task 1

[Task 1a] Create a database with three tables, i.e. Student (according to Table 1), Course (Table 2), and Enrolled (Table 3); Test and save your .sql script as "lab1_task1a_create_db.sql".
[Task 1b] Solve the following queries:

1. Select all students above the age of 20;
2. Who is the oldest student?
3. Count the number of students with age below 20;
4. How many types of majors were these students admitted to?
5. What is the average GPA of students with age above 20?
6. What is the average GPA of students studying the Physics major?
7. What is the average age of students who took Linear algebra courses?
8. How many courses has Alice registered for?

9. How many credits has Alice registered?
10. How many credits have students with ages below 20 registered to?

sid	full_name	major	age	GPA
c1	Alice	CS	21	4.0
p2	Albert	PHY	22	3.9
e3	Tim	EE	20	3.9
m4	Kayle	MATH	19	3.8
p5	Yasuo	PHY	19	3.7

Table 1: Student

cid	course_name	course_code	credits
11	Linear algebra	MATH105	5
22	Algorithms	CS101	5
33	Databases	DS001	4.5
44	Physics I	PHY001	6

Table 2: Course

sid	cid	grade
c1	11	A
c1	33	A
p2	44	A
p5	44	B
m4	11	A
p2	11	B
m4	22	B
p5	33	C
c1	22	A

Table 3: Enrolled

[Task 1c] After solving queries above, can you propose two or more queries of practical usage?

Task 2

In task 2, you will come up with SQL queries for four Databases, i.e. sql_inventory, sql_HR, sql_invoicing, and sql_store. These databases can be acquired by executing the script "example-create-databases.sql", available on the blackboard.
[Task 2a] Solve the following queries:

sql_inventory	What is the most valuable asset in the inventory?
sql_inventory	How much does the entire inventory worth?
sql_hr	Where is the largest office (in terms of numbers of employees) located?
sql_hr	Who sits alone?
sql_invoicing	What is the most common payment method?
sql_invoicing	Which client seems to be the most important one? Motivate your approach and answer.
sql_store	How much do order 2 worth?
sql_store	Which customer has their order delivered?

[Task 2b] In addition to the the queries above, propose two or more queries of practical usage, for each of these Databases.

Task 3

Download the Movie Database shared on the blackboard.
[Task 3a] Solve the following queries:

1. How many movies have the highest rating?
2. What are the most common genres in this database?
3. Which movie is the longest?

[Task 3b] In addition to the the queries above, propose two or more queries of your interesting.

Grading Criteria

- Your submission (on blackboard) should include a .zip file of **code** (i.e. .sql scripts) and a **report** of what you have done, observed and learned. Please name the sql scripts with the task id, e.g. "lab1_task1b.sql" for task 1b.