

Tutorial 2: Basic SQL

Preparation

1. Review the slides of Weeks 1 and 2.
2. Login to DBeaver and connect to MySQL and make sure you have the tables products, pcs, laptops, printers, customers and sales from [pcshop.sql](#) in your database.
3. Make sure you have access to all the tables and can write queries.

Exercise 1

The goal of this exercise is to practice single-table queries in SQL.

Questions

Write SQL `SELECT` statements for performing the following queries:

- a. List the model numbers of all products made by maker B.
- b. List the model numbers of all products not made by maker B.
- c. List the model numbers of all PCs with speed ≥ 3.00 .
- d. List the model numbers of all color laser printers.
- e. List the customer IDs of all customers who paid for a product with a visa card (debit or credit).
- f. List the first names, the last names, the city and the street address of all customers who have the letter 'e' either in their first name or in their last name.
- g. List all attributes of the transactions (from table sales) made between the 18th and the 20th of December 2013 (including the 18th and the 20th).
- h. List all attributes of the transactions (from table sales) made either before the 18th or after the 20th of December 2013.
- i. Assume all prices in table Laptops are in Euro. List the model numbers of all laptops with ram at least 1024. For each model, list also its price in USD. Assume that 1 USD = 0.85 EURO.

Exercise 2

The goal of this exercise is to practice joins and subqueries using SQL `SELECT`.

Questions

Joins and subqueries

Write SQL `SELECT` statements for performing the following queries. Use either a join or a subquery. If a question is asking to include attributes from one table only in the `SELECT` clause of the `SELECT` statement, try to find two solutions, one with a join, and another with a subquery.

- a. List all PC models that have been sold at least once.
- b. List the makers of laptops with speed of at least 2.00.
- c. List all pairs of PC models that have both the same speed and ram. A pair should be listed only once; e.g., list (i, j) but not (j, i).
- d. List the makers that make at least two different models of PC.
- e. List the maker(s) of the laptop(s) with the highest available speed.
- f. List the cities with customers who bought a printer.
- g. List the makers of PCs that don't make any laptop (but may make printers)
- h. List the makers of PCs that don't make any laptop or printer
- i. List the model numbers and prices of laptops which are cheaper than at least one PC

Outer joins

Write SQL SELECT statements which use outer joins for performing the following queries.

- j. List all makers, all model numbers they make, and the corresponding product types (i.e. the entire maker, model and type columns from table Products). For the PC models only list their speed and price as well in two additional columns. These two extra columns should contain NULL markers for laptop and printer models.
- k. List all laptop model numbers and only for those made by makers A and B list also their price. The prices of laptops not made by either A or B should be NULL.
 - **Hint:** List the laptop model numbers made by A and B and their prices. Use the result of this query as a subquery in the FROM clause of the main query.
- l. List the names (first name and last name) of customers who haven't bought any product. Use an outer join. Can you solve it with a subquery instead?
 - **Hint:** In the solution that uses an outer join, use IS NOT NULL in the WHERE clause.
 - **Note:** There are no such customers in the example database. Insert a new customer into table customers to test your solution.