Databases Lab

In this lab you are going to create a database schema, populate it with data, and run several SQL queries on it. Steps 1 to 2 are needed only if you install MySQL on your laptop/home computer, otherwise skip to Step 3. The descriptions below are mainly for the edition of the MySQL Community Server 5.6.42 or 5.6.21 (similar buttons exist for other editions, with some functionality possibly missing, e.g., reverse engineer a database relational schema to an ERD, separate windows for running scripts or queries, etc.).

Step 1: Install MySQL Community Server

Download MYSQL Community Server from http://dev.mysql.com/downloads/mysql/. Select your operating system (Microsoft Windows, Mac OS X, etc.) and your machine type (32 bit or 64 bit). Follow the instructions from the Web page above (skip the registration on Oracle website). You need to select skip updates, a complete installation, developer machine, and set root password.

Step 2: Start the server

Select the MySQL notifier from notification area from the far right side of the task bar. If MySQL server is stopped, press start.

Step 3: Start the client

Start MySQL Workbench from the Programming group in the start menu area on bottom left hand side menu of your screen (or MySQL group if working from your installation on a laptop). Click on the Connect to Database from Database menu and input the database server (*flagellum.edu.eur.nl* or *37.34.59.200*), port (*33*06), login (*eur_STUDENTID*, e.g., *eur_46213dva*) and password (*STUDENTID*, e.g., *46213dva*) (or click on local instance and type the previously set password for local installation).

Step 4: Create the database

Create a new database schema and give it a name only if you use your laptop, otherwise the database is already created for you with name *eur_STUDENTID*, e.g., *eur_46213dva*. Select the database by double clicking on it. Copy-paste the text from the script *createScript.sql* and press the button with a lightening symbol on it. In this way, the database schema is created. After that copy-paste the text from the script *smallRelationsInsertFile.sql* and press the button with a lightening symbol on it. In this way the database instance is created.

Step 4: View the database in an ER diagram

Select Database and then Reverse Engineer, connect to the database, and select the database schema. Select Arrange and then Autolayout. You can save your ER diagram in a pdf file by pressing File, then Export, and after that Export as pdf.

Step 5: Run queries

Run the SQL queries on the previously built database by typing them and pressing the button with a lightening symbol on it.

Query 1 Find the department names of all instructors, and remove duplicates

Query 2 Find the department names of all instructors, and keep duplicates

Query 3 Select all information from instructor table

Query 4 Select all information from instructor table, but salary should be monthly instead of yearly

Query 5 Find all instructors in Comp. Sci. department with salary > 80000

Query 6 Find the Cartesian product of *instructor* and *teaches*

Query 7 For all instructors who have taught courses, find their names and the course ID of the courses they taught.

Query 8 Find the course ID, semester, year and title of each course offered by the Comp. Sci. department

Query 9 Find the natural join of *instructor* and *teaches*

Query 10 List the names of instructors along with the course ID of the courses that they taught (using a natural join).

Query 11 List the ID and name of instructors along with the monthly salary labeled as monthly_salary

Query 12 Find the names of all instructors who have a higher salary than some instructor in 'Comp. Sci.'

Query 13 Find the names of all instructors whose name includes the substring "ai"

Query 14 Find the names of all instructors whose name includes the substring "ai%" (N.B. The default escape operator is "\")

Query 15 Find the names of all instructors whose name includes the substring "ai%" or have a name from three letters

Query 16 List in alphabetic order the names of all instructors

Query 17 List in descending alphabetic order the names of all instructors

Query 18 List in alphabetic order the names of all instructors; instructors with the same name should be sorted by department name

Query 19 Find the names of all instructors with salary between $90,000 and $100,000

Query 20 Find the names of instructors and the courses that they teach in the Biology department

Query 21 Find courses that ran in Fall 2009 or in Spring 2010

Query 22 Find courses that ran in Fall 2009 and in Spring 2010 (N.B. There is no intersection operator in MySQL)