

CSIT115 Data Management and Security

Laboratory 3

Scope

This laboratory includes the following:

- tasks related to application of Data Manipulation statements and simple `SELECT` statements of SQL
- tasks related to the applications of `SELECT` statement of SQL

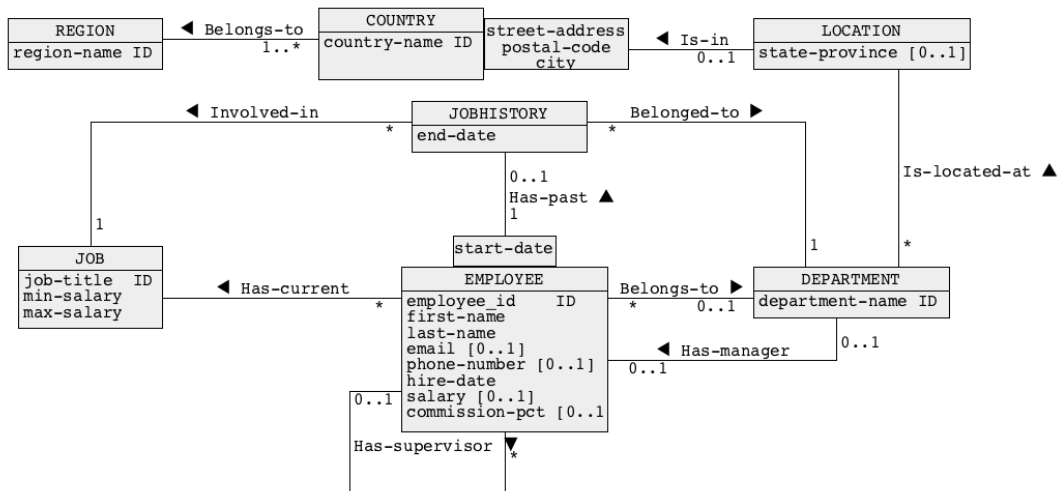
Specification of each task starts from a new page.

It is recommended to solve the problems before attending an enrolled laboratory class in order to efficiently use supervised laboratory time.

Prologue

Download the files `dbcreate.sql`, `dbdrop.sql`, and `dbload.sql`. Copy the files to your USB drive such that you can access the files either through command line interface `mysql` or graphical user interface MySQL Workbench. You can also email the files to yourself such that you can access it on different systems. Finally, the simplest solution is to download the files directly to Ubuntu Linux from `moodle`.

Connect to MySQL either through command line interface `mysql` or graphical user interface MySQL Workbench and execute script files `dbcreate.sql` and `dbload.sql`. The script files create and load data into a database that contain information about a company and its employees. The company consists of several departments located in the cities all over the world. The database also contains information about the present and past jobs of its employees and about the present managerial structure. A conceptual schema of the database is given below.



Task 1

Your task is to use INSERT, DELETE, and UPDATE statements of SQL to implement a script file `solution1.sql` that performs the database manipulation operations listed below. **An important condition is that you are NOT ALLOWED to alter and/or drop any consistency constraints before and during execution of the script!**

- (1) Insert into the database information about an employee.

Harry Potter, employee id 300, phone number 515.123.8182, hired at 10 February 2010. His email is `harrypotter@gmail.com`. He has been hired as a Programmer. His salary is 7000 and his commission percentage is 50%. He works in the department of Information Technology and his supervisor id is 103.

- (2) An employee with an employee id equal to 206 is not a supervisor of any other employee. The employee decided to leave a company. Remove from a database all information about the employee.
- (3) A department Human Resources has been moved to a new location. The new address is 100 Century Avenue, Shanghai, China. Post code is 200120.

When ready execute SQL script `solution1.sql` and save a report from the processing of the script in a file `solution1.rpt`.

Hint: You can find a lot of applications of database manipulation statements in the "Cookbook".

Task 2

Connect to MySQL either through command line interface `mysql` or graphical user interface `MySQL Workbench` and execute the script files `dbdrop.sql`, `dbcreate.sql`, and `dbload.sql` to refresh the contents of the sample database

Implement the following queries as `SELECT` statements of SQL and save the statements in SQL script file `solution2.sql`.

- (1) Find the names of departments located in Sydney, Australia.
- (2) Find the titles of jobs that offer salary in a range between 7500 and 8500 inclusive. Note, that a job with a salary range between 7600 and 8000 should be included in the answer.
- (3) Find the full names of employees who are the topmost level supervisors, i.e. who are not supervised by any other employee.
- (4) Find the employee ids and job titles of employees whose jobs ended in 1998.
- (5) List the full names of all departments and full names of employees working in each department. The results should be displayed in the descending order of department names and the full names of employees from the same department must be listed in the ascending order of the last names.

When ready execute SQL scrip `solution2.sql` and save a report from execution in a file `solution2.rpt`.

Hint: You can find similar `SELECT` statement already implemented in the *"Cookbook"*.

Task 3

Implement SQL script `solution3.sql` that contains implementations of the following queries as `SELECT` statements.

- (1) Find the names of departments located either in Japan or Singapore.
- (2) Find the names of departments and names of countries located in Americas.
- (3) Find the full names of employees who work in New York.
- (4) Find the full names of employees whose commission percentage (`commission_pct`) is not empty.
- (5) Find the job titles and total number of employees for each job title. The results will be sorted by the job titles in ascending order.

Hint: The implementations of similar `SELECT` statements are included in the *"Cookbook"*.

Task 4

Implement SQL script `solution4.sql` that contains implementations of the following queries as `SELECT` statements.

- (1) Find the names of departments, names of countries and total number of employees for each department that hires more than three employees.
- (2) Find the job titles, minimum and maximum salaries for each job title that has more than 5 employees hired for such jobs.
- (3) Find the employee ids, full names of employees who completed their jobs. **Note:** Information about employees who have already completed their jobs is stored in a table `JOBHISTORY`.
- (4) Find the employee id, first name and last name for each employee who is directly managed by Alberto Errazuriz.
- (5) Find the employee ids, first names, last names of employees who are working on their jobs. **Note:** The employees who are working on their jobs either have no record in a table `JOBHISTORY` or their hire dates are later than their last jobs' end date.

Hint: The implementations of similar `SELECT` statements are included in the *"Cookbook"*.