

CSIT115/CSIT815 Data Management and Security Laboratory 5

Scope

This laboratory includes a task related to SQL statements.

Important messages

Please read the messages listed below before implementation of a task included in a specification of Laboratory 5.

More implementation related information can be found in "How to ... ?" Cookbook available through Moodle or at:

<http://www.uow.edu.au/~jrg/115/COOKBOOK>.

The outcomes of Laboratory 5 are due by **Saturday, 29 September, 2018, 11.55 pm (sharp)**.

Laboratory 5 contributes to 3% of the total evaluation in the subject. 2 tasks are included in this laboratory.

A submission procedure is explained at the end of this document.

Only one submission of Laboratory 5 is allowed and only one submission per student is accepted. Please make sure that you submit the correct files.

A submission that contains an incorrect file attached is treated as a correct submission with all consequences coming from the evaluation of the file attached.

Compressed (zipped, rared, tared, etc) files will not be evaluated.

All files left on Moodle in a state "Draft (not submitted) " will not be evaluated.

A submission marked by Moodle as "late" is treated as a late submission no matter how many seconds it is late.

A policy regarding late submissions is included in CSIT115/815 Subject Outline.

Prologue

Download the files `dbcreate.sql`, `dbdrop.sql`, `dbload.sql`, template files `solution1.sql` and `solution2.sql`, and `dbschema.pdf`. Copy the files to your USB drive or email the files to yourself such that you can access all of them either through command line interface `mysql` or graphical user interface MySQL Workbench.

Connect to MySQL database server either through command line interface `mysql` or graphical user interface MySQL Workbench.

When connected, select a database `csit115` with a command

```
use csit115
```

It is strongly recommended to process SQL script file `dbdrop.sql` to drop all relational tables used for implementation of the previous assessment task.

To re-create the relational tables of a sample database, process SQL script `dbcreate.sql`.

To load data into the relational tables created in the previous step process SQL script `dbload.sql`.

To list the names of relational tables created, use a command `show tables`.

To list a structure of a relational table `<table-name>` use a command: `describe <table-name>`.

Use a pdf viewer to open a file `dbschema.pdf` with a conceptual schema of the sample database.

No report is expected from the implementation of the steps listed above.

Tasks

Task 1 (1.5 marks)

Process SQL script file `dbdrop.sql` to drop all relational tables used for implementation of the previous task.

To re-create the relational tables of a sample database, process SQL script `dbcreate.sql`.

To load data into the relational tables created in the previous step process SQL script `dbload.sql`.

No report is expected from the implementation of the steps listed above.

Implement the queries as `SELECT` statements of SQL in a given template script file `solution1.sql` for the questions below. One `SELECT` statement for each question.

- (1) Use self-join to find employee number and name of all employees that directly supervised by the employee Albert.
- (2) Find department number and name for the departments which have the least budget of project.
- (3) Find employee number and name for the employees who have been assigned the most total number of projects.
- (4) Find employee number and name for the employees who work in the department that has the maximum total budgets of projects.
- (5) Find employee number and name for all employees who have the maximum number of dependents.

When ready execute SQL scrip `solution1.sql` and save a report from execution in a file `solution1.rpt`.

Start mysql command line in a terminal by

```
mysql -u csit115 -p -v -c
```

Then input a password `csit115`. It allows MySQL database server to display comments and SQL script for each question in a report.

Use the commands as follows to generate a report for Task 1.

```
tee solution1.rpt;  
source solution1.sql;  
notee;
```

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

Deliverables

A file `solution1.rpt` with a report from processing of SQL script `solution1.sql`. The report **MUST** have no errors and the report **MUST** list all SQL statements processed.

A report that contains no listing of executed SQL statements scores no marks and report that contains errors also scores no marks !

Submission of a file with a different name and/or different extension and/or different type scores no marks.

Task 2 (1.5 marks)

Process SQL script file `dbdrop.sql` to drop all relational tables used for implementation of the previous task.

To re-create the relational tables of a sample database, process SQL script `dbcreate.sql`.

To load data into the relational tables created in the previous step process SQL script `dbload.sql`.

No report is expected from the implementation of the steps listed above.

Implement the following advanced manipulations on the database in SQL in a given template script file `solution2.sql` for the questions below.

- (1) Create an empty relational table to store information about the names of department, the total number of projects and total budgets of the projects owned by each department. A name of relational table and the names of columns are up to you. Enforce the appropriate primary key and referential integrity constraints (if any).

Next, load into the table information about the names of departments together with the total number of projects and the total budgets of the projects owned by each department. If a department owns no project, then its name must be recorded with a number zeros (0) for the total number and budgets.

Finally display all the information of the new table.

- (2) Create a relational table that contains information about the numbers and names of all employees and the titles of projects assigned to each one of them.

All data must be loaded into the table by the same SQL statement that creates the table.

Enforce the appropriate primary key and referential integrity constraints (if any) after data is loaded.

- (3) Add a column to a relational table `Employee` to store information about the total number of projects assigned to each one of them. A name of the column is up to you. Assume that no more than 9 projects are assigned for each employee.

Next, use a single `UPDATE` statement to set the values in the new column consistent with the present contents of the sample database.

When ready execute SQL scrip `solution2.sql` and save a report from the processing of the script in a file `solution2.rpt`.

Start mysql command line in a terminal by

```
mysql -u csit115 -p -v -c
```

Then input a password `csit115`. It allows MySQL database server to display comments and SQL script for each question in a report.

Use the commands as follows to generate a report for Task 2.

```
tee solution2.rpt;  
source solution2.sql;  
notee;
```

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

Deliverables

A file `solution2.rpt` with a report from processing of SQL script `solution2.sql`. The report **MUST** have no errors and the report **MUST** list all SQL statements processed.

A report that contains no listing of executed SQL statements scores no marks and report that contains errors also scores no marks!

Submission of a file with a different name and/or different extension and/or different type scores no marks.

Submission

Submit files **solution1.rpt** and **solution2.rpt** to Moodle in the following way:

- (1) Access Moodle at **<http://moodle.uowplatform.edu.au/>**
- (2) To login use a **Login** link located in the right upper corner the Web page or in the middle of the bottom of the Web page
- (3) When logged select a site **CSIT115/DPIT115/CSIT815 (S218) Data Management & Security**
- (4) Scroll down to a section **Submissions**
- (5) Click at a link **In this place you can submit the outcomes of Laboratory 5**
- (6) Click at a button **Add Submission**
- (7) Move a file **solution1.rpt** into an area **You can drag and drop files here to add them**. You can also use a link **Add..**
- (8) Repeat step (7) for the file **solution2.rpt**.
- (9) Click at a button **Save changes**
- (10) Click at a button **Submit assignment**
- (11) Click at the checkbox with a text attached: **By checking this box, I confirm that this submission is my own work, ...** in order to confirm the authorship of your submission
- (12) Click at a button **Continue**.

It is expected that a problem included within **Laboratory 5** will be solved **individually without any cooperation** with the other students. If you have any doubts, questions, etc. please consult your lecturer or tutor during lab classes or office hours. Plagiarism will result in a **FAIL** grade being recorded for that assessment task.

End of specification