School of Computing and Information Technology
University of Wollongong

Session: **Spring 2019**
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# CSIT115/CSIT815 Data Management and Security
## Laboratory 4
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## Scope

This laboratory includes the tasks related to application of data definition (DDL) and data manipulation (DML) statements of SQL.

The outcomes of the laboratory work are due by **Saturday 14 September 2019, 7.00 pm (sharp).**

**Please read very carefully information listed below.**
This laboratory contributes to 3% of the total evaluation in a subject CSIT115 and it contributes to 3% of the total evaluation in a subject CSIT815.

A submission procedure is explained at the end of specification.

This laboratory work consists of 1 task.

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

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 the subject outline.

A submission of compressed files (zipped, gzipped, rared, tared, 7-zipped, lhzed, … etc) is not allowed. The compressed files will not be evaluated.

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

An implementation that does not compile due to one or more syntactical errors scores no marks and implementation that has the processing errors scores no marks.

It is expected that all tasks included within **Laboratory 4** 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 the assessment task.

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## Prologue

In this laboratory you must use a virtual machine with MySQL 8.0.16. All technical details on how to start and how to use a virtual machine have been explained and practiced in Laboratory 1, task 2 and task 3.

Connect to Moodle and download the files `dbcreate.sql`, `dbdrop.sql`, `dbload.sql`, `dbcount.sql`, and `dbschema.bmp` from Sample database section on Moodle.

SQL script `dbcreate.sql` can be used to create the relational tables of a sample database. SQL script `dbdrop.sql` can be used to drop the tables of a sample database. SQL script `dbload.sql` can be used to load data into a sample database. SQL script `dbcount.sql` can be used to display the total number of rows in each table included in a sample database. Finally, a file `dbschema.bmp` contains a conceptual schema of a sample database.

Connect to MySQL database server either through command line interface mysql or graphical user interface SQL Developer.

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

To 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>`.

To list the total number of rows in each relational table process a script `dbcount.sql`.

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

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

## Tasks

### Task 1 (3 marks)

Download a file solution1.sql and insert into the file the implementations of the following modifications of the structures, consistency constraints, and/or the contents of the sample database. Note, that you may need more than one SQL statement to implement a single subtask listed below. Your implementation must directly follow a comment with a specification of a subtask.

(1) Modify a consistency constraint of the sample database such that after a modification it is possible to record in the database information about the drivers who are sick.

(2) Modify a structure and consistency constraint of the sample database such that after a modification it is possible to add information about the total number of repairs performed on each truck. Assume that, a truck cannot be repaired more than 1000 times.

(3) Modify a structure and consistency constraint of the sample database such that after a modification it is possible to store in the database optional information about the cost of each trip. Assume, that cost of a single trip is a positive number not greater that 9999.99.

(4) Modify a structure and consistency constraints of a sample database such it is possible to store in a database information about the mechanics employed by a transportation company. Assume that a description of mechanic is the same as a description of driver.

(5) Assume that the mechanics are assigned to the trucks such that each mechanic is assigned to many trucks and each truck has at most one mechanic assigned. Modify a structure and consistency constraints of a sample database such that after a modification it is possible to store in the database information about which mechanic is assigned to which truck.

(6) Add to the database information about a new trip and information about two legs the new trip consists of. All information about the new trip and its two legs is up to you.

(7) Change a status of a truck with a registration number PKR768 to USED.

(8) Remove from the database all information about a trip number 35.

(9) Modify a consistency constraint of the sample database such that the values in a column REGNUM in a relational table TRIP are optional.

(10) Remove from the database information about a truck with a registration number KKK007. Leave in the database information about the trips performed by the truck.

You can find a lot of information about application of data definition statements and data manipulation statements of SQL in a presentation 09 SQL - Data Definition Language (DDL) and in Cookbook, How to use data definition and basic data manipulation statements of SQL, Recipe 4.1 How to create and how to alter the relational tables?

To implement and to test SQL script file `solution1.sql` you can either use graphical user interface SQL Developer or command line interface mysql.

It is recommended to use a script `dbdrop.sql` to drop all relational tables modified during the processing of a script `solution1.sql` and then to re-create the original database with a script `dbcreate.sql`. In such a way your script always operates on the original structures of the sample database.

To create a report from processing of a script file `solution1.sql` open a Terminal window and start the command line interface `mysql` in the following way:

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

Next, process SQL script `solution1.sql` and save a report in a file `solution1.rpt`. Note, that when started with the options **-v** and **-c** the command line interface includes both listing of `SELECT` statements processed and the comments included in the original version of a file `solution1.sql`.

We have already practiced saving a report from processing of SQL script in the Laboratories 1 and 3. You can also find more information about creating reports from processing of SQL scripts in Cookbook, Recipe 3.1 How to use "mysql? Command based interface to MySQL database server? Step 4 How to save the results of SQL processing in a file?"

A report that contains no listing of processed SQL statements scores no marks and report that contains errors of any kind also scores no marks !

**Deliverables**

A file `solution1.rpt` with a report from processing of SQL script `solution1.sql`. The report must be created with the command line interface mysql, the report MUST NOT include any errors, and the report MUST LIST ALL SQL statements processed and ALL comments included in the original (downloaded) version of `solution1.sql`. Marks will be deducted for the missing comments. Submission of a file with a different name and/or different extension and/or different type scores no marks.

**Submission**

Note, that you have only one submission. So, make it absolutely sure that you submit correct files with the correct contents. No other submission is possible !

Submit a file **`solution1.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/CSIT815 (S219) 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 4`**
(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) Click at a button **`Save changes`**
(9) Click at a button **`Submit assignment`**
(10) 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
(11) Click at a button **`Continue`**

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*End of specification*