School of Computing and Information Technology
University of Wollongong

Session: **Spring 2020**
Lecturer: **Janusz R. Getta**

CSCI835 Database Systems
Assignment 0 (zero)
21 August 2020

This assignment is only for the students who are enrolled in a subject CSCI835 Database Systems

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Scope

This assignment includes the tasks related to the design and creation of a relational database, loading data into a database, modification of database structures, implementation of data manipulation and data retrieval operation from a database.

The outcomes of the laboratory work are due by **Saturday 29 August, 2020, 7.00 pm (sharp).**

Please read very carefully information listed below.

This supplementary assignment contributes to 10% of the total evaluation in a subject CSCI835.

A submission procedure is explained at the end of assignment specification.

This assignment consists of 5 tasks and specification of each task starts from a new page.

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.

All submissions must be in a form of reports from processing of SQL scripts. It is explained at the end of specification of each task how to create a report from processing of SQL script. Plain SQL files without the reports from the processing will not be evaluated.

It is expected that all tasks included within **Assignment 0 (zero)** 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.

Task 1 (2 marks)
An objective of this task is to implement a relational database

We would like to implement a relational database to store information about real estate properties and owners of real estate properties.

To simplify a design, we consider only two types of real properties: stand-alone houses and blocks of land.

Both types of real estate properties are described by a full address that consists of city, street, building number/lot number, and area.

Stand-alone houses are additionally described by the total number of bedrooms.

Stand-alone houses and blocks of land are uniquely identified by a group of attributes city, street, and building number/lot number.

The real estate properties are owned by the owners. A typical owner is described by first name, last name, and mobile phone number. An owner is identified by a mobile phone number.

Whenever a real estate property is put on a market the owners provide information about their asking price for such property.

Implement SQL script `solution1.sql` with `CREATE TABLE` statements that implement the database described above.

When ready use **`SQLcl`** to process SQL script file `solution1.sql` and save a report from processing in a file `solution1.lst`. **You must use `SQLcl` to create a report !**

Your report must include a listing of all SQL statements processed. To achieve that put the following **`SQLcl`** commands:

```
SPOOL solution1
SET ECHO ON
SET FEEDBACK ON
SET LINESIZE 300
SET PAGESIZE 200
```

at the beginning of SQL script and

```
SPOOL OFF
```

at the end of SQL script.

It is strongly recommended to implement a script `dbdrop.sql` that drops the relational tables created during testing. The script can be used at the testing stages to avoid the errors when processing `CREATE TABLE` statements.

It is explained in `Cookbook, Recipe 2.5 How to use SQLcl client ? Step 9 How to create and to save a report ?` how to create a report from processing of SQL script.

Deliverables

A file `solution1.lst` with a report from processing of a script file `solution1.sql`. A report must have no errors and it must list all SQL statements processed.

Task 2 (2 marks)
An objective of this task is to enter sample data into a relational database

We would like to store in the database information that satisfies the following constraints.

(1) The database contains information about 5 real estate properties that include 2 stand-alone houses and 3 blocks of land.

(2) The database contains information about 3 owners. The first owner owns 1 stand-alone house and 2 blocks of land. The second owner owns 1 stand-alone house. The third owner owns only one block of land.

(3) All values of attributes must be meaningful, for example the first name of an owner like `QQQ` is unacceptable. No marks will be granted for task 2 and 30% will be deducted from the total evaluation of Assignment 0 (zero) for meaningless values of the attributes.

Please also note, that the values of attributes will be used to verify originality of your work.

Implement SQL script `solution2.sql` with `INSERT` statements that enter data into the database created in the previous step.

When ready use **`SQLcl`** to process SQL script file `solution2.sql` and save a report from processing in a file `solution2.lst`. **<u>You must use `SQLcl` to create a report !</u>**

Your report must include a listing of all SQL statements processed. To achieve that put the following **`SQLcl`** commands:

```
SPOOL solution2
SET ECHO ON
SET FEEDBACK ON
SET LINESIZE 300
SET PAGESIZE 200
```

at the beginning of SQL script and

```
SPOOL OFF
```

at the end of SQL script.

It is explained in `Cookbook, Recipe 2.5 How to use SQLcl client ? Step 9 How to create and to save a report ?` how to create a report from processing of SQL script.

Deliverables

A file `solution2.lst` with a report from processing of a script file `solution2.sql`. A report must have no errors and it must list all SQL statements processed.

Task 3 (2 marks)
An objective of this task is to perform the structural modifications of a relational database

We would like to change the structures of the database created and loaded with data in the previous steps in the following ways.

(1) It should be possible to keep information about the dates when a real estate property has been put on a market.

(2) It should be possible to keep information about total number of properties (both blocks of land and stand-alone houses) owned by each owner.

(3) It should be possible to keep information about potential buyers and their interests in the real estate properties offered for sale. A potential buyer is uniquely identified by mobile phone number. Additional description of a buyer includes first name and last name. A potential buyer expresses his/her interests in purchasing of one or more real estate properties.

Implement SQL script `solution3.sql` with `SQL` statements that perform the structural modification listed above.

When ready use **`SQLcl`** to process SQL script file `solution3.sql` and save a report from processing in a file `solution3.lst`. **You must use `SQLcl` to create a report !**

Your report must include a listing of all SQL statements processed. To achieve that put the following **`SQLcl`** commands:

```
SPOOL solution3
SET ECHO ON
SET FEEDBACK ON
SET LINESIZE 300
SET PAGESIZE 200
```

at the beginning of SQL script and

```
SPOOL OFF
```

at the end of SQL script.

It is explained in `Cookbook, Recipe 2.5 How to use SQLcl client ? Step 9 How to create and to save a report ?` how to create a report from processing of SQL script.

Deliverables

A file `solution3.lst` with a report from processing of a script file `solution3.sql`. A report must have no errors and it must list all SQL statements processed.

Task 4 (2 marks)
An objective of this task is to perform the data manipulations on a relational database

We would like to change the contents of the database created and loaded with data in the previous steps in the following ways.

(1) Remove one of the real estate properties from a market.

(2) Remove an owner that owns no real estate properties.

(3) Fill a column with information about the total number or properties owned by each owner.

Implement SQL script `solution4.sql` with `SQL` statements that perform the modifications listed above.

When ready use **`SQLcl`** to process SQL script file `solution4.sql` and save a report from processing in a file `solution4.lst`. **You must use `SQLcl` to create a report !**

Your report must include a listing of all SQL statements processed. To achieve that put the following **`SQLcl`** commands:

```
SPOOL solution4
SET ECHO ON
SET FEEDBACK ON
SET LINESIZE 300
SET PAGESIZE 200
```

at the beginning of SQL script and

```
SPOOL OFF
```

at the end of SQL script.

It is explained in `Cookbook, Recipe 2.5 How to use SQLcl client ? Step 9 How to create and to save a report ?` how to create a report from processing of SQL script.

Deliverables
A file `solution4.lst` with a report from processing of a script file `solution4.sql`. A report must have no errors and it must list all SQL statements processed.

Task 5 (2 marks)
An objective of this task is to implement data retrieval from a relational database

We would like to implement the following queries as `SELECT` statements.

(1) List full address of each real estate property together with the first and last name of an owner.

(2) List the first name and last name of the owners together with the total number of a stand-alone houses owned.

(3) List first name and last name of all owners together with information about blocks of land owned. Note, if an owner does not own a block of land then still list his/her first and last name.

(4) List the first and last name of all owners who own at least one stand-alone house and at least one block of land.

Implement SQL script `solution5.sql` with `SELECT` statements that perform the modifications listed above.

When ready use **`SQLcl`** to process SQL script file `solution5.sql` and save a report from processing in a file `solution5.lst`. **<u>You must use `SQLcl` to create a report !</u>**

Your report must include a listing of all SQL statements processed. To achieve that put the following **`SQLcl`** commands:

```
SPOOL solution5
SET ECHO ON
SET FEEDBACK ON
SET LINESIZE 300
SET PAGESIZE 200
```

at the beginning of SQL script and

```
SPOOL OFF
```

at the end of SQL script.

It is explained in `Cookbook, Recipe 2.5 How to use SQLcl client ? Step 9 How to create and to save a report ?` how to create a report from processing of SQL script.

Deliverables

A file `solution5.lst` with a report from processing of a script file `solution5.sql`. A report must have no errors and it must list all SQL statements processed.

Submission

Submit the files **solution1.lst**, **solution2.lst**, **solution3.lst**, **solution4.lst**, and **solution5.lst** through 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 **CSCI835/CSCI235 (S220) Database Systems**
(4) Scroll down to a section **SUBMISSIONS**
(5) Click at a link **In this place you can submit the outcomes of Assignment 0 (zero) for CSCI835 students only**
(6) Click at a button **Add Submission**
(7) Move a file **solution1.lst** into an area **You can drag and drop files here to add them**. You can also use a link **Add**...
(8) Repeat a step (7) for the files **solution2.lst**, **solution3.lst**, **solution4.lst**, and **solution5.lst**.
(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**

End of specification