

## **CSIT115/CSIT815 Data Management and Security**

### **Laboratory 1**

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#### **Scope**

This laboratory includes the tasks related to the simple applications of the software systems that will be used in a subject CSIT115/815 Data Management and Security in Autumn session 2019.

The outcomes of the laboratory work are due by **Saturday 16 March 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 3 tasks and specification of each task starts from a new page.

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.

It is expected that all tasks included within **Laboratory 1** 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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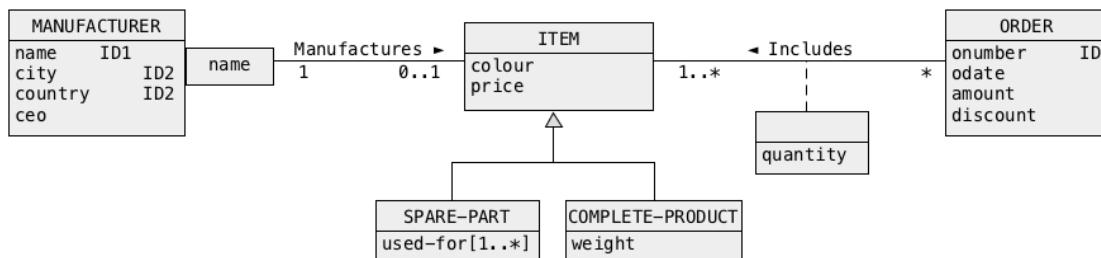
## Tasks

### **Task 1 (1 mark)**

An objective of this task is to show you how to create conceptual database schema with UMLet 14.3.

Perform the following steps.

- (1) Start and connect to your Windows system.
- (2) UMLet 14.3 is a tool for drawing UML diagrams. To start UMLet 14.3 use a shortcut UMLet-Shortcut available on Desktop. The shortcut has an icon that consists of a red circle crossed with a horizontal red bar with a white text UMLet.
- (3) When UMLet is started navigate to the right upper corner of UMLet window and pick a palette CSIT115-815Palette. Do not use any other palette !
- (4) Use UMLet application to draw a diagram given below. It is explained in the Cookbook, Recipe 2.1, Steps 1 and 2 "How to create very simple conceptual schemas with UMLet?" how to use UMLet to create class diagrams. For a moment, do not worry about the meanings of a diagram created. It will be explained to you later on during the lecture classes.



- (5) When ready, add one more attribute to a class **COMPLETE-PRODUCT** and one more association between the classes **MANUFACTURER** and **ITEM**. A new attribute and a new association are up to you.
- (6) Use an option File->Save to save your diagram in a file `solution1.uxf`. Do not delete a file `solution1.uxf`.
- (7) Use an option File->Export as... to export your diagram into a file `solution1.bmp` in BMP format. Do not delete an exported file. You will submit it as one of the deliverables from your laboratory work.

**Deliverables**

A file `solution1.bmp` that contains a diagram given above extended with an attribute and with an association. A submission of a file `solution1.uxf` is not expected and it scores no marks. Submission of a file with a different name and/or different extension and/or different type scores no marks as well.

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## Task 2(1 mark)

An objective of this task is to learn how to use a graphical user interface (GUI) MySQL Workbench to create and to process SQL scripts.

Perform the following steps.

- (1) Start and connect to your Windows 7 system.
- (2) To start VirtualBox navigate through the following menus:  
Start->All Programs->Oracle VM VirtualBox->Oracle VM VirtualBox.  
It is explained in Cookbook, Recipe 1.1, Step 1 "How to start VirtualBox ?" how to start VirtualBox. Start VirtualBox.
- (3) When VirtualBox is started import an appliance Ubuntu18.04-64bits-MySQL8.0.13-07-NOV-2018 located on a drive VMs(E:) in a folder Virtual Machines\CSIT115-Janusz. It is explained in Cookbook, Recipe 1.1 Step 2 "How to import an appliance to VirtualBox ?" how to import an appliance.
- (4) Copy a file Ubuntu18.04-64bits-MySQL8.0.13-07-NOV-2018.ova to your USB drive. It will allow you to import it to VirtualBox installed on your system at home. Then, the same software as installed in a laboratory class you will be able to use at home. Unfortunately, you still have to come to the laboratory classes ☹.
- (5) Power on a virtual machine Ubuntu18.04-64bits-MySQL8.0.13-07-NOV-2018. It is explained in Cookbook, Recipe 1.1 Step 4 "How to power on a virtual machine ?" how to power on a virtual machine.
- (6) When Ubuntu 18.04 operating system displays an orange box with a name of CSIT115 user press Enter key and then type csit115 into a Password field. Then, wait until operating system displays a column of icons on the left-hand side of a screen.
- (7) Start MySQL Workbench Graphical User Interface (GUI). To start MySQL Workbench GUI leftclick at the 6th from top blue icon with a silhouette of a white dolphin.
- (8) Next, leftclick at a small "+" sign located after "MySQL Connections" string to create a new connection. Type into a field Connection Name your connection name (a name is up to you), into a field Username csit115, and into a field Default Schema csit115. Finally, click at OK button.

- (9) To open your new connection leftclick at a rectangle that represents a new connection in a front panel of MySQL Workbench. Next, type in a password: `csit115` of `csit115` database user and click at OK button.

- (10) Type into Query 1 subwindow the following lines.

```
CREATE TABLE ITEM( name      VARCHAR(20) NOT NULL,
                    status   CHAR(1) NOT NULL);
```

```
INSERT INTO ITEM VALUES('bolt','A');
INSERT INTO ITEM VALUES('screw','N');
```

```
COMMIT;
```

```
SELECT COUNT(*), SYSDATE()
FROM ITEM;
```

- (11) Save the text typed in the previous step as SQL script in a file `task2.sql`. To do so either use File->Save Script As ... menus or "floppy disk" icon in Query 1 subwindow (the 2<sup>nd</sup> icon from left, btw do you know what is a "floppy disk"? ). Do not delete a file `task2.sql`. You will submit it as one of the deliverables from your laboratory work.
- (12) To submit a script for processing by MySQL database server leftclick at the first line of a script and later on leftclick at "yellow lightning" icon just above a workspace with the script. It is the third icon from left in `task2` subwindow. Note, that Query 1 subwindow has changed its name to `task2` after saving SQL statements in a file `task2.sql`.

You should get the results of processing in a workspace below. If the results do not show up you may have to expand the subwindows with the results and the messages. To do so, move a cursor to a bottom line of subwindow `task2` with a text of a script `task2.sql` to a location where a cursor changes its shape to a vertical double (up and down) arrow. Then press a left button and while it is pressed move a cursor up. Repeat such procedure for both results and messages subwindows. You may need to ask a tutor about help.

- (13) Note, that it is also possible to process a single SQL statement from your script independently on the other statements. To do so, leftclick at one of `INSERT` statements and then leftclick at "yellow lightning" icon with a silhouette of "white cursor" just above a workspace with the script (the 4<sup>th</sup> icon from left). A technique of processing the individual SQL statements in one-by-one mode is very useful at the debugging stages.

**Deliverables**

A files `task2.sql` with SQL script created and tested in Task 2. Submission of a file with a different name and/or different extension and/or different type scores no marks.

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### Task 3 (1 mark)

An objective of this task is to learn how to use a command line interface `mysql` to process SQL scripts and how to create and save the reports from processing of SQL scripts.

Perform the following steps.

- (1) If you have not done Task 2 yet then do it now ! Otherwise proceed from the next step.
- (2) Start Terminal program. It is visualized as a black rectangle icon with white frame in a column of icons on left hand side of a screen (it is the 5<sup>th</sup> icon from top).
- (3) To start a command line interface (CLI) MySQL database server type at a command prompt in Terminal window:

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

and press Enter key. A password you are asked about is `csit115`.

- (4) When a command line interface to MySQL database server is started process a command:

```
use csit115;
```

at `mysql>` prompt to select `csit115` database.

- (5) Next, process the following commands in Terminal window at `mysql>` prompt

```
tee solution2.rpt;  
source task2.sql;  
notee;
```

to submit a script `task2.sql` for processing by MySQL and to save a report from processing of the script in a file `solution2.rpt`. Do not delete a file `solution2.rpt`. It will be submitted as one of the deliverables from your laboratory work.

`tee solution2.rpt` command copies the messages and results displayed on a screen into a text file, in this case into `solution2.rpt` file. `notee` command stops copying the messages and results displayed on a screen to a file.

`source task2.sql` command sends SQL statements included in script file `task2.sql` for processing by MySQL database server.

- (6) It is also possible to modify the contents of SQL script file at this stage. To do it process at `mysql>` prompt a command

```
exit;
```

To quit `mysql` CLI. Next, at `$` prompt in Terminal window process a command

```
gedit task2.sql
```

to open a text editor with SQL script file `task2.sql`. Now, you can change script, save it, and process it again in a way explained above. It is possible to develop SQL scripts with an editor and command line interface (CLI) to a database server, however, using graphical user interface (GUI) MySQL Workbench is much easier.

### **Deliverables**

The files `solution2.rpt` with a report from processing of SQL script `task2.sql`. Submission of a file with a different name and/or different extension and/or different type scores no marks.

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## 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 the files **solution1.bmp**, **task2.sql**, 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/CSIT815 (S119) 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 1**
- (6) Click at a button **Add Submission**
- (7) Move a file **solution1.bmp** 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 files **task2.sql**, and **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**

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*End of specification*