

Assignment 3

Aim

The objectives of this assignment include:

- tasks related to implementation of discretionary access control, granting system resources, verification of complex consistency constraints,
- tasks related to using backup and restore features of DBMS to find the differences between two states of a relational table, and implementation of a simple auditing system.

Prologue

Download and unzip a file A3-all-files.zip. You should get the files Assignment3.pdf, A3create.sql, A3load.sql, A3drop.sql, A3change1b.sql and A3change2b.sql. Copy the files to your USB drive such that you can access all files either through command line interface mysql or graphical user interface MySQL Workbench.

The script files create and load data into a database that contains information about books, authors, and customers. The database also contains information about the types of purchases.

Task 1 – Part A

- (1) Connect to MySQL as a user root either through command line interface mysql or graphical user interface MySQL Workbench and create a new database with a name the same as *<prefix of your UOW email account>*.
- (2) While connected as a user root use SQL script A3create.sql to create the relational tables in a database created in the previous step. A script A3create.sql creates the relational tables that can be used to store information about books, authors, customers, purchase, online purchase and walk-in purchase. Execute a script A3load.sql to load data into the relational tables that created by A3create.sql. You can use a script A3drop.sql to drop the relational tables. Do not drop the relational tables now!

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

Implement SQL script that performs the following actions as a user root.

- (1) Create three users with the following user names:
<prefix of your UOW email account>_1
<prefix of your UOW email account>_2
<prefix of your UOW email account>_3
For example, if your UOW email prefix is abc123 then the names of users are abc123_1, abc123_2 and abc123_3. Set all passwords to be the same as the user names. For example, if the username is abc123_1, the password should be set to abc123_1.
- (2) Next, the script grants to the user *<prefix of your UOW email account>_1* to alter relational tables, to drop relational tables, and to **read** and **write** relational tables in a database with the same name as *<prefix of your UOW email account>*. The privilege must be granted such that the user *<prefix of your UOW email account>_1* is able to grant all privileges listed above to the other users.
- (3) Next, the script grants to the user *<prefix of your UOW email account>_2* to create views, and read data from the relational tables BOOK and AUTHOR in a database with the same name as *<prefix of your UOW email account>*. The privilege must be granted such that the user *<prefix of your UOW email account>_2* is NOT able to grant all privileges listed above to the other users.
- (4) Next, the script sets the following values of resource limits to a user *<prefix of your UOW email account>_3*: total number of queries an account owner can issue per hour must be set to 100, and total number of updates an account owner can issue per hour must be set to 10.
- (5) Next, the script expires the password of the account *<prefix of your UOW email account>_2*
- (6) Finally, the script lists the privileges granted to all new users, *<prefix of your UOW email account>_1*, *<prefix of your UOW email account>_2*, *<prefix of your UOW email account>_3*, the values of resource limits set in a step (4) and a status of *<prefix of your UOW email account>_2* set in a step (5). To do so your script must access appropriate relational tables in a database mysql. Do not list information NOT related to the actions performed above!

Deliverables

- A) Submit a file with a report from processing of your SQL script. The report **MUST** have no errors and the report **MUST** list all SQL statements processed.
- B) Please refer to **Appendix A**, for details on deliverables & file naming conventions for this task.
- C) Please refer to **Appendix B**, for details on submission procedures and when to submit, for this assignment.
- D) Please refer to **Appendix C**, which describes the assessment / grading guidelines for this assignment

Task 1 – Part B

- (1) Connect to MySQL either through command line interface mysql or graphical user interface MySQL Workbench as user csit115 and execute a script file A3drop.sql and immediately after that the scripts A3create.sql and A3load.sql to refresh the contents of a database csit115. Exit command line interface mysql or graphical user interface MySQL Workbench.
- (2) Create a logical backup of a relational table BOOK and save it in a file with the same name as *<prefix of your UOW email account>.bak*.
- (3) Connect as a user csit115 to MySQL either through command line interface mysql or graphical user interface MySQL Workbench and execute a script file A3change1b.sql.
- (4) Use a text editor and modify a backup file obtained in a step (2) such that a backup of a relational table BOOK can be restored into a relational table with the same name as a *<prefix of your UOW email account>_DOC*.
- (5) Use an updated backup file *<prefix of your UOW email account>.bak* to load the contents of the backup into a relational table *<prefix of your UOW email account>_DOC*. DO NOT delete the backup file!

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

Implement SQL script that finds the differences between the contents of a relational table BOOK and a relational table with the same name as *<prefix of your UOW email account>_DOC*.

The script must first list the rows added to the relational table BOOK after the backup file was created, then the rows deleted from a relational tables BOOK after the backup file was created, and finally list the rows changed in relational table BOOK after the backup file was created.

In brief, the script must first list all added rows, then all deleted rows, and finally all changed rows in a relational table BOOK. It is allowed to use more than one SELECT statement to implement this task.

Deliverables

- A) Submit a file with a report from processing of your SQL script and the updated backup file in a step (5). The report MUST have no errors and the report MUST list all SQL statements processed.
- B) Please refer to **Appendix A**, for details on deliverables & file naming conventions for this task.
- C) Please refer to **Appendix B**, for details on submission procedures and when to submit, for this assignment.
- D) Please refer to **Appendix C**, which describes the assessment / grading guidelines for this assignment

Task 2 – Part A

Connect to MySQL either through command line interface mysql or graphical user interface MySQL Workbench as user csit115 and execute a script file A3drop.sql and immediately after that the scripts A3create.sql and A3load.sql to refresh the contents of a database csit115.

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

Implement SQL script that performs the following actions.

- (1) The script finds all cases that violate in a database csit115 the following consistency constraint.

“A purchase which is an online purchase should NOT be a walk-in purchase”

The script must list the outcomes of verification of the consistency constraint as a single column table with the following messages as the following rows.

A purchase with the purchase ID of <insert PurchaseID here> is an online purchase of type <insert OnlineType here> and also a walkin purchase of location <insert ShopLocation here >

Use a function CONCAT to create the messages above. It is NOT allowed to use more than one SELECT statement to implement this task.

Note, that it is NOT your task to eliminate the violations of consistency constraint listed above.

Deliverables

- A) Submit a file with a report from processing of your SQL script. The report MUST have no errors and the report MUST list the SQL statement processed.
- B) Please refer to **Appendix A**, for details on deliverables & file naming conventions for this task.
- C) Please refer to **Appendix B**, for details on submission procedures and when to submit, for this assignment.
- D) Please refer to **Appendix C**, which describes the assessment / grading guidelines for this assignment

Task 2 – Part B

In this task you will implement your own simple method of auditing the database activities.

Connect to MySQL as a user root either through command line interface mysql or graphical user interface MySQL Workbench and execute a script file A3drop.sql and immediately after that execute script A3create.sql and A3load.sql to refresh a database csit115.

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

Implement SQL script that performs the following actions.

- (1) First, the script sets the appropriate values of the variables that allow create a general log, to save a general log in a relational table, and to start recording a general log from now.
- (2) Next, the script makes a relational table that contains a general log empty.
- (3) Next, the script executes a script file A3change2b.sql. (Do NOT put results of execution of script A3change2b.sql into a report.)
- (4) Next, the script sets the appropriate values of all variables that stop recording a general log from now.
- (5) Next, the script lists the DDL statements (CREATE, ALTER, DROP) processed in a period of time when a general log was recorded.
- (6) Next, the script lists the DML statements (SELECT, INSERT, DELETE, UPDATE) processed in a period of time when a general log was recorded. Sort the results in a descending order of the total number of times a DML statement has been processed.

Deliverables

- A) Submit a file with a report from processing of your SQL script. The report MUST have no errors and the report MUST list all SQL statements processed.
- B) Please refer to **Appendix A**, for details on deliverables & file naming conventions for this task.
- C) Please refer to **Appendix B**, for details on submission procedures and when to submit, for this assignment.
- D) Please refer to **Appendix C**, which describes the assessment / grading guidelines for this assignment

APPENDIX A

File Naming Conventions

For **all files** in general, please use following naming format as a PRE-FIX:

<FT/PT>_<Your Grp>_A**3**-T**1a**_<Stud. No.>_<Name>.<file extension>

- **<FT/PT>** Use “**FT**” for Full-Time student, “**PT**” if you are Part-Time student
- **<Your Grp>** refers to your SIM tutorial group (e.g. TutGrp1 / TutGrp2 / etc.)
- **A2** if you are submitting assignment 2, **A3** if submitting assignment 3, etc.
- **T1a** if file contains answers for Task 1 part A, **T2b** if file contains answers for Task 2 part B, etc.
- **<Stud. No.>** refers to your UOW assigned student number (e.g. 12345678)
- **<Name>** refers to your UOW registered name (e.g. JohnDoeAnderson)
- **<file extension>** refers to the type of file (e.g. .sql, .rpt, .bak)

Deliverables

The deliverables include the following:

- a) Four SQL scripts (Task 1 Part A, Task 1 Part B, Task 2 Part A, Task 2 Part B)

Please rename your file according to the required file naming convention!

E.g. =>**FT**_TutGrp2_A**3**-T**1a**_1234567_JohnDoeAnderson_Sql.sql

- b) Four reports produced using the tee command (Task 1 Part A, Task 1 Part B, Task 2 Part A, Task 2 Part B)

Please rename your file according to the required file naming convention!

E.g. =>**FT**_TutGrp2_A**3**-T**1a**_1234567_JohnDoeAnderson_Rpt.rpt

- c) A .bakfile for Task 1 Part B

Please rename your file according to the required file naming convention!

E.g. =>**FT**_TutGrp3_A**3**-T**1b**_1234567_JohnDoeAnderson_Bak.bak

- d) Compress all your assignment files into a **single zip file**. Please use the following naming format :

<FT/PT>_<Your Grp>_A<3>_<Stud. No.>_<Name>.ZIP

Example : FT_TutGrp3_A3_1234567_JohnDoeAnderson.ZIP

- **<FT/PT>** Use “**FT**” for **F**ull-**T**ime student, “**PT**” if you are **P**art-**T**ime student
 - **<Your Grp>** refers to your SIM tutorial group (e.g. **TutGrp1** / **TutGrp2** / etc.)
 - **A2** if you are submitting assignment **2**, **A3** if you are submitting assignment **3**, etc.
 - **<Stud. No.>** refers to your UOW assigned student number (e.g. **12345678**)
 - **<Name>** refers to your UOW registered name (e.g. **JohnDoeAnderson**)
- e) A Q&A / demo / evaluation will be held during lab session. You must be prepared to present / perform certain tasks / answer questions posed by the tutor, regarding your application of the SQL scripts and the final answer in your submission.

APPENDIX B

How to Submit – Normal Workflow

- A) Please double-check that all your filenames are in the correct naming convention
- B) Please submit via Moodle using the following steps:
- (i) Login to your Moodle account
 - (ii) Select the site for this Subject : CSIT115 Data Management and Security
 - (iii) Scroll down and look for the section on Submissions
 - (iv) Click at the link **"in this place you can submit the outcomes of Assignment . . ."**
 - (v) Click at a button **"Add Submission"**
 - (vi) Use the link **"Add . . ."**, OR drag your **ZIP** file into the area **"You can drag and drop files here to add them . . ."**
 - (vii) Click at a button **"Save changes"**
 - (viii) Click at a button **"Submit assignment"**
 - (ix) 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
 - (x) Click at a button **Continue**
 - (xi) ... and that's it!
- C) Please take note of the following submission policies
- (i) Only one submission of this assignment is allowed and only one submission per student is accepted
 - (ii) A submission marked by Moodle as "late" is always treated as a late submission no matter how many seconds it is late.
 - (iii) 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. (i.e. no marks can be given if file does not contain the required content!)

How to Submit – "Emergency" Workflow

In the event of UNFORSEEN SITUATIONS :

(E.g. New student+skip orientation, joining the current quarter as the 1st semester, Student's moodle account not ready, cannot login to moodle, forget password, eLearning site down on submission day, repeated interrupted internet connection, unable to upload assignment, etc)

Please submit your Assignment using the following steps :

- A) Please double-check that all your filenames are in the correct naming convention
- B) Compress all your assignment files into a **single zip file**. Please use the following naming format :

<FT/PT>_<Your Grp>_A<Stud. No.>_<Name>.ZIP

Example : FT_TutGrp3_A3_1234567_JohnDoeAnderson.ZIP

- <FT/PT> Use “FT” for Full-Time student, “PT” if you are Part-Time student
- <Your Grp> refers to your SIM tutorial group (e.g. TutGrp1 / TutGrp2 / etc.)
- A2 if you are submitting assignment 2, A3 if submitting assignment 3, etc.
- <Stud. No.> refers to your UOW assigned student number (e.g. 12345678)
- <Name> refers to your UOW registered name (e.g. JohnDoeAnderson)

- C) Please email your single zip file to your tutor at :

csit115@yahoo.com

for **FULL** TIME students

kttan007@gmail.com

for **PART** TIME students

In your email **subject** line, type in the following information :

<FT/PT> <Your Grp> <assignment info> <student number> and <name>

Example:

To : tutor's email (see above)

Subject : FT TutGrp1 A3 1234567 JohnDoeAnderson

Note1 : The timestamp shown on tutor's email Inbox will be used to determine if the assignment is late or not.

Note2 : After email submission, your mailbox's **sent folder** would have a copy (record) of your sent email, please **do not delete** that copy !! It could be used to prove your timely submission, in case the Tutor did not receive your email!

When to Submit

- A) After the submission of deliverables, students may be given a chance to explain / demo their understanding of the process, and how they derive their answers. Depending on the time-table, a demo / Q&A / testing for your assignment may be scheduled during the
- 3rd - 5th lab session for the semester (i.e. lab 3 - 5), for Full Time (**FT**) students
 - 2nd - 4th lab session for the semester (i.e. lab 2 - 4), for Part Time (**PT**) students

Further instructions will be given by the Tutor during the subsequent respective labs. Please consult your tutor for further details. Some time would be allocated for each student to present / demo / explain his solution during the session. Please pay attention as failure to adhere to instructions may result in deduction of marks.

- B) Please refer to the following table which contains general info on the different submission events and deadlines

Assignment	Submission Deadline (check Moodle for EXACT date-time)		Assignment Demo / Q&A / Testing (Tasks), during your respective ...
	PT (must be before ...)	FT (must be before ...)	
1	Lab 2	Lab 3	Lab 2(PT), Lab 3(FT)
2	Lab 3	Lab 4	Lab 3(PT), Lab 4(FT)
3	Lab 4	Lab 5	Lab 4(PT), Lab 5(FT)

Note: (PT) = Part Time Students, (FT) = Full Time Students !

- C) Non-submission of any of the above mentioned deliverables will result in ZERO marks! Please check with your Tutor personally if you are unsure!

APPENDIX C

! VERY IMPORTANT !

PLEASE FOLLOW ALL THE INSTRUCTIONS STATED IN ALL THE APPENDICES !!

IT IS CRUCIAL THAT YOU FOLLOW CLOSELY ALL POINTS STATED IN TASK REQUIREMENTS

IF YOU ARE **NOT SURE**,

PLEASE **CHECK WITH YOUR TUTOR** DURING LABS / LECTURES !

MARKS WILL BE DEDUCTED IF YOU FAIL TO FOLLOW INSTRUCTIONS !!

Assessment Guidelines

In general, student's deliverables will be assessed based on the following principles :

- (i) Whether the submission has adhered to the instructions (painstakingly elaborated) in the assignment document. For example, marks may be deducted for situations like :
 - missing / partial / incorrect file naming conventions
 - incorrect file format (e.g. submitting *.**txt** instead of *.**rpt**)
 - partial / non submission of required deliverables
 - late submissions / plagiarism
 - submitted files cannot be opened by the relevant software
 - content in deliverables is partially or totally different from what is stated in task requirements (e.g. drawing class diagram instead of SQL scripts)
 - content in deliverables does not conform to the required format (e.g. A report that contains processing errors)
 - failure to fulfill the administrative instructions stated in the assignment in general
 - inability to explain / demonstrate understanding of own answers, during Q & A
- (ii) With regards to requirements stated (for different tasks), the following guidelines apply :
 - **Coverage** : How much of the information mentioned in the Task Description has been considered in your process and your final answer
 - **Clarity / Accuracy** : Are there any portions of your process / final answer that is unclear or subject to multiple interpretations. Are there any attempts to use different examples to prove your understanding?
 - **Verification** : Successful demonstration, clarity of communication and satisfactory answers given during Q & A