LAB REPORT

Lab 5
Views and Roles

CSE 4308
DATABASE MANAGEMENT SYSTEMS LAB

NAME: CHOWDHURY ASHFAQ
STUDENT ID: 200042123
PROGRAM: SWE
GROUP: 1A
DATE: 08/10/22

Tasks:

1. Create a view named `Advisor_Selection` that shows the ID, name and department name of instructors.

2. Create another view named `Student_Count` using `Advisor_Selection` and advisor to show the name of the instructor and the number students assigned under them.

3. Four categories of users have been identified in the database:

   (a) Students should be able to view information regarding advisors and courses.
   (b) Course teachers should be able to view information about the students and courses.
   (c) Head of the Departments should have all the privileges that a course teacher has. Additionally, s/he should be able to add new instructors.
   (d) Administrator should be able to see information about department and instructors. They should also be able to update the department budget.

   Create roles for these categories and grant them appropriate privileges.

4. Create users under these roles and write relevant SQL queries to demonstrate that the imposed access control works.

In this Lab Task we were given to perform various DDL (Data Definition Language) and DML (Data Modification Language) operations.

Analysis of the problem:

Two files DDL+drop.sql and smallRelationsInsertFile.sql scripts were given and we need to perform various operations on them after executing them.

Solution:

```sql
1)CREATE OR REPLACE VIEW Advisor_Selection
AS
SELECT ID , NAME , DEPT_NAME
FROM
INSTRUCTOR;

SELECT * FROM Advisor_Selection;




2)CREATE OR REPLACE VIEW Student_Count
AS
SELECT NAME , COUNT(S_ID) AS COUNT
FROM Advisor_Selection, Advisor
WHERE Advisor_Selection.ID = Advisor.I_ID
GROUP BY NAME;

SELECT * FROM Student_Count;


3)a)
CREATE ROLE STUDENT ;
GRANT SELECT ON ash200042123.ADVISOR TO STUDENT ;
GRANT SELECT ON  ash200042123.COURSE TO STUDENT ;


3)b)
CREATE ROLE COURSE_TEACHER ;
GRANT SELECT ON ash200042123.STUDENT TO COURSE_TEACHER;
GRANT SELECT ON ash200042123.COURSE TO COURSE_TEACHER ;


3)c)
CREATE ROLE DEPT_HEAD;
GRANT COURSE_TEACHER TO DEPT_HEAD;
GRANT INSERT ON ash200042123.INSTRUCTOR to DEPT_HEAD;

/*insert into instructor values ('12547', 'Jimmy', 'Elec. Eng.', '80000');*/
```

```sql
3)d)
CREATE ROLE ADMINISTRATOR ;
GRANT SELECT ON ash200042123.DEPARTMENT TO ADMINISTRATOR;
GRANT SELECT ON  ash200042123.INSTRUCTOR TO ADMINISTRATOR;
GRANT UPDATE (BUDGET) ON ash200042123.DEPARTMENT TO ADMINISTRATOR;


4)
CREATE USER ASHFAQ IDENTIFIED BY cse4308;
GRANT STUDENT TO ASHFAQ;
GRANT CREATE SESSION TO ASHFAQ;


CREATE USER RIDUN IDENTIFIED BY cse4308;
GRANT COURSE_TEACHER TO RIDUN;
GRANT CREATE SESSION TO RIDUN;


CREATE USER SHUVRO IDENTIFIED BY cse4308;
GRANT ADMINISTRATOR TO SHUVRO;
GRANT CREATE SESSION TO SHUVRO;


CREATE USER SHOYEB IDENTIFIED BY cse4308;
GRANT DEPT_HEAD TO SHOYEB;
GRANT CREATE SESSION TO SHOYEB;

/*After logging in as student*/
SELECT * FROM ash200042123.ADVISOR;
SELECT * FROM ash200042123.COURSE;
SELECT * FROM ash200042123.DEPARTMENT; /*CANNOT be accessed*/


/*After logging in as course teacher*/
SELECT * FROM ash200042123.STUDENT;
SELECT * FROM ash200042123.COURSE;
SELECT * FROM ash200042123.ADVISOR; /*CANNOT be accessed*/

/*After logging in as department head*/
insert into ash200042123.instructor values ('54321', 'Laal', 'Biology', '100000');
```

```
/*After logging in as administrator*/
SELECT * FROM ash200042123.DEPARTMENT;
SELECT * FROM ash200042123.INSTRUCTOR;

UPDATE ash200042123.DEPARTMENT
SET BUDGET='150000'
WHERE DEPT_NAME = 'Elec. Eng.';

UPDATE ash200042123.DEPARTMENT
SET BUILDING='AB2'
WHERE DEPT_NAME = 'Elec. Eng.';/*CANNOT be updated*/
```

OUTPUT:

```
/*After logging in as administrator*/
SELECT * FROM ash200042123.DEPARTMENT;
SELECT * FROM ash200042123.INSTRUCTOR;

SET BUDGET='150000'
WHERE DEPT_NAME = 'Elec. Eng.';

UPDATE ash200042123.DEPARTMENT
SET BUILDING='AB2'
```

```
ID     NAME                 DEPT_NAME
-----  -------------------- --------------------
10101  Srinivasan           Comp. Sci.
12121  Wu                   Finance
15151  Mozart               Music
22222  Einstein             Physics
32343  El Said              History
33456  Gold                 Physics
45565  Katz                 Comp. Sci.
58583  Califieri            History
76543  Singh                Finance
76766  Crick                Biology
83821  Brandt               Comp. Sci.

ID     NAME                 DEPT_NAME
-----  -------------------- --------------------
98345  Kim                  Elec. Eng.
12345  Jim                  Elec. Eng.
54321  Laal                 Biology

14 rows selected.


ID     NAME                 DEPT_NAME
-----  -------------------- --------------------
10101  Srinivasan           Comp. Sci.
12121  Wu                   Finance
15151  Mozart               Music
22222  Einstein             Physics
32343  El Said              History
33456  Gold                 Physics
45565  Katz                 Comp. Sci.
58583  Califieri            History
76543  Singh                Finance
76766  Crick                Biology
83821  Brandt               Comp. Sci.

ID     NAME                 DEPT_NAME
-----  -------------------- --------------------
98345  Kim                  Elec. Eng.
12345  Jim                  Elec. Eng.
54321  Laal                 Biology

14 rows selected.
```

```
View created.


NAME                     COUNT
-------------------- ----------
Einstein                     2
Crick                        1
Srinivasan                   1
Kim                          2
Singh                        1
Katz                         2

6 rows selected.


Grant succeeded.


Grant succeeded.


Grant succeeded.


Grant succeeded.


Grant succeeded.

Grant succeeded.


Grant succeeded.


Grant succeeded.
```

```
S_ID  I_ID
----- -----
00128 45565
12345 10101
23121 76543
44553 22222
45678 22222
76543 45565
76653 98345
98765 98345
98988 76766

9 rows selected.


COURSE_I TITLE                                        DEPT_NAME
-------- -------------------------------------------- --------------------
    CREDITS
----------
BIO-101  Intro. to Biology                            Biology
        4

BIO-301  Genetics                                     Biology
        4

BIO-399  Computational Biology                        Biology
        3


COURSE_I TITLE                                        DEPT_NAME
-------- -------------------------------------------- --------------------
    CREDITS
----------
CS-101   Intro. to Computer Science                   Comp. Sci.
        4

CS-190   Game Design                                  Comp. Sci.
        4

CS-315   Robotics                                     Comp. Sci.
        3


COURSE_I TITLE                                        DEPT_NAME
-------- -------------------------------------------- --------------------
    CREDITS
----------
CS-319   Image Processing                             Comp. Sci.
        3
```

```
CS-347    Database System Concepts                     Comp. Sci.
          3

EE-181    Intro. to Digital Systems                    Elec. Eng.
          3


COURSE_I TITLE                                         DEPT_NAME
-------- ------------------------------------------- --------------------
   CREDITS
----------
FIN-201  Investment Banking                            Finance
         3

HIS-351  World History                                 History
         3

MU-199   Music Video Production                        Music
         3


COURSE_I TITLE                                         DEPT_NAME
-------- ------------------------------------------- --------------------
   CREDITS
----------
PHY-101  Physical Principles                           Physics
         4


13 rows selected.

SELECT * FROM ash200042123.DEPARTMENT; /*CANNOT be accessed*/
                                 *
ERROR at line 1:
ORA-00911: invalid character



ID    NAME                 DEPT_NAME            TOT_CRED
----- -------------------- -------------------- ----------
00128 Zhang                Comp. Sci.                 102
12345 Shankar              Comp. Sci.                  32
19991 Brandt               History                     80
23121 Chavez               Finance                    110
44553 Peltier              Physics                     56
45678 Levy                 Physics                     46
54321 Williams             Comp. Sci.                  54
55739 Sanchez              Music                       38
70557 Snow                 Physics                      0
76543 Brown                Comp. Sci.                  58
```

```
76653 Aoi                   Elec. Eng.                60

ID    NAME                  DEPT_NAME             TOT_CRED
----- ------------------    -------------------   ----------
98765 Bourikas              Elec. Eng.                98
98988 Tanaka                Biology                  120

13 rows selected.


COURSE_I TITLE                                        DEPT_NAME
-------- ------------------------------------------   -------------------
   CREDITS
----------
BIO-101  Intro. to Biology                            Biology
         4

BIO-301  Genetics                                     Biology
         4

BIO-399  Computational Biology                        Biology
         3


COURSE_I TITLE                                        DEPT_NAME
-------- ------------------------------------------   -------------------
   CREDITS
----------
CS-101   Intro. to Computer Science                   Comp. Sci.
         4

CS-190   Game Design                                  Comp. Sci.
         4

CS-315   Robotics                                     Comp. Sci.
         3


COURSE_I TITLE                                        DEPT_NAME
-------- ------------------------------------------   -------------------
   CREDITS
----------
CS-319   Image Processing                             Comp. Sci.
         3

CS-347   Database System Concepts                     Comp. Sci.
         3

EE-181   Intro. to Digital Systems                    Elec. Eng.
         3
```

```
COURSE_I TITLE                                            DEPT_NAME
-------- ------------------------------------------------ --------------------
   CREDITS
----------
FIN-201  Investment Banking                               Finance
         3

HIS-351  World History                                    History
         3

MU-199   Music Video Production                           Music
         3


COURSE_I TITLE                                            DEPT_NAME
-------- ------------------------------------------------ --------------------
   CREDITS
----------
PHY-101  Physical Principles                              Physics
         4
```

```
DEPT_NAME            BUILDING          BUDGET
-------------------- --------------- ----------
Biology              Watson             90000
Comp. Sci.           Taylor            100000
Elec. Eng.           Taylor            150000
Finance              Painter           120000
History              Painter            50000
Music                Packard            80000
Physics              Watson             70000

7 rows selected.


ID    NAME                 DEPT_NAME            SALARY
----- -------------------- -------------------- ----------
10101 Srinivasan           Comp. Sci.            65000
12121 Wu                   Finance               90000
15151 Mozart               Music                 40000
22222 Einstein             Physics               95000
32343 El Said              History               60000
33456 Gold                 Physics               87000
45565 Katz                 Comp. Sci.            75000
58583 Califieri            History               62000
76543 Singh                Finance               80000
76766 Crick                Biology               72000
83821 Brandt               Comp. Sci.            92000

ID    NAME                 DEPT_NAME            SALARY
----- -------------------- -------------------- ----------
98345 Kim                  Elec. Eng.            80000
12345 Jim                  Elec. Eng.            80000
54321 Laal                 Biology              100000

14 rows selected.


1 row updated.
```