DBMS Assignment 5 - Lab 6 Report

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1 Introduction

This is a report about the tasks given in the 6th lab.

2 Tasks

2.1 Task Overview

This lab consisted of 4 tasks in total:

- Creating 2 views

- Creating four categories of users.Creating roles for them and granting them appropriate privileges.

- Creating users under those created roles and writing relevant SQL queries to demonstrate that the imposed access control works.

2.2 Statements

2.2.1 Dropping Views and Roles

```
1  --dropping the views in case they exist in the system
2
3  drop view Advisor_Selection;
4  drop view Student_Count;
```

```
SQL> connect namisa/123456;
Connected.
SQL> drop view Advisor_Selection;

View dropped.

SQL> drop view Student_Count;

View dropped.
```

```sql
--dropping the roles in case they exist in the system

drop role student;
drop role course_teacher;
drop role head_of_dept;
drop role admin;
```

```
SQL> drop role student;

Role dropped.

SQL> drop role course_teacher;

Role dropped.

SQL> drop role head_of_dept;

Role dropped.

SQL> drop role admin;

Role dropped.
```

2.2.2 Creating Views

```
1 --1. Create a view named Advisor_Selection that shows the ID,
      name and department name of instructors.
2
3 create view Advisor_Selection as
4 select i.ID, i.name, i.dept_name
5 from instructor i;
```

```
SQL> create view Advisor_Selection as
  2   select i.ID, i.name, i.dept_name
  3   from instructor i;

View created.
```

```
1  --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.
2
3  create view Student_count as
4  select a.i_id as instructor_id, ad_select.name as
       instructor_name, count(a.s_id) as student_count
5  from advisor a
6  join Advisor_Selection ad_select on a.i_id = ad_select.id
7  group by a.i_id, ad_select.name;
```

```
SQL> create view Student_count as
  2  select a.i_id as instructor_id, ad_select.name as instructor_name, count(a.s_id) as student_count
  3  from advisor a
  4  join Advisor_Selection ad_select on a.i_id = ad_select.id
  5  group by a.i_id, ad_select.name;

View created.
```

2.2.3 Four categories of users have been identified in the database:

```
1  --3(a)Students should be able to view information regarding
       advisors and courses.
2
3  create role student;
4  grant select on namisa.advisor to student;
5  grant select on namisa.course to student;
6
7  --3(b)Course teachers should be able to view information
       about the students and courses.
8
9  create role course_teacher;
10 grant select on namisa.student to course_teacher;
11 grant select on namisa.course to course_teacher;
12
13 --3(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.
14
15 create role head_of_dept;
16 grant course_teacher to head_of_dept;
17 grant insert on namisa.instructor to head_of_dept;
18
19 --3(d)Administrator should be able to see information about
       department and instructors. They should also be able to
       update the department budget.
```

```
20
21 create role admin;
22 grant select on namisa.department to admin;
23 grant select on namisa.instructor to admin;
24 grant update(budget) on department to admin;
```

```
SQL> --3.a
SQL> create role student;

Role created.

SQL> grant select on namisa.advisor to student;

Grant succeeded.

SQL> grant select on namisa.course to student;

Grant succeeded.

SQL>
SQL>
SQL> --3.b
SQL> create role course_teacher;

Role created.

SQL> grant select on namisa.student to course_teacher;

Grant succeeded.

SQL> grant select on namisa.course to course_teacher;

Grant succeeded.

SQL>
SQL>
SQL> --3.c
SQL> create role head_of_dept;

Role created.

SQL> grant course_teacher to head_of_dept;

Grant succeeded.

SQL> grant insert on namisa.instructor to head_of_dept;

Grant succeeded.

SQL>
SQL>
SQL>
SQL> --3.d
SQL> create role admin;

Role created.

SQL> grant select on namisa.department to admin;

Grant succeeded.

SQL> grant select on namisa.instructor to admin;

Grant succeeded.

SQL> grant update(budget) on department to admin;

Grant succeeded.
```

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

```sql
--4

--student role
create user stdnt1 identified by stdntpass;
grant create session, resource, create tablespace to stdnt1;
grant student to stdnt1;
connect stdnt1/stdntpass;
select * from namisa.advisor;
select * from namisa.course;
--won't work
select * from namisa.time_slot;

connect namisa/123456;
drop user stdnt1 cascade;
show user;
```

```
SQL> --student role
SQL> create user stdnt1 identified by stdntpass;

User created.

SQL> grant create session, resource, create tablespace to stdnt1;

Grant succeeded.

SQL> grant student to stdnt1;

Grant succeeded.

SQL> connect stdnt1/stdntpass;
Connected.
SQL> select * from namisa.advisor;

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.

SQL> select * from namisa.course;

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.

SQL> --won't work
SQL> select * from namisa.time_slot;
select * from namisa.time_slot
                     *
ERROR at line 1:
ORA-00942: table or view does not exist


SQL>
SQL> connect namisa/123456;
Connected.
SQL> drop user stdnt1 cascade;

User dropped.

SQL> show user;
USER is "NAMISA"
```

```
1  --course_teacher role
2  create user teacher1 identified by teacherpass;
3  grant create session, resource, create tablespace to teacher1
     ;
4  grant course_teacher to teacher1;
```

9

```sql
connect teacher1/teacherpass;
select * from namisa.student;
select * from namisa.course;
--won't work
select * from namisa.time_slot;

connect namisa/123456;
drop user teacher1 cascade;
show user;
```

```
SQL> create user teacher1 identified by teacherpass;

User created.

SQL> grant create session, resource, create tablespace to teacher1;

Grant succeeded.

SQL> grant course_teacher to teacher1;

Grant succeeded.

SQL> connect teacher1/teacherpass;
Connected.
SQL> select * from namisa.student;

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.

SQL> select * from namisa.course;

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.

SQL> --won't work
SQL> select * from namisa.time_slot;
select * from namisa.time_slot
                      *
ERROR at line 1:
ORA-00942: table or view does not exist


SQL>
SQL> connect namisa/123456;
Connected.
SQL> drop user teacher1 cascade;

User dropped.

SQL> show user;
USER is "NAMISA"
SQL>
```

```sql
--head_of_dept role
create user hod1 identified by hodpass;
grant create session, resource, create tablespace to hod1;
grant head_of_dept to hod1;
connect hod1/hodpass;
select * from namisa.student;
select * from namisa.course;
--won't work
select * from namisa.time_slot;
insert into namisa.instructor (ID,name,dept_name,salary)
values ('00012','llll','Physics',50000);

connect namisa/123456;
drop user hod1 cascade;
show user;
```

```
SQL> --head_of_dept role
SQL> create user hod1 identified by hodpass;

User created.

SQL> grant create session, resource, create tablespace to hod1;

Grant succeeded.

SQL> grant head_of_dept to hod1;

Grant succeeded.

SQL> connect hod1/hodpass;
Connected.
SQL> select * from namisa.student;

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.

SQL> select * from namisa.course;

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.
```

```
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.

SQL> --won't work
SQL> select * from namisa.time_slot;
select * from namisa.time_slot
                  *
ERROR at line 1:
ORA-00942: table or view does not exist


SQL> insert into namisa.instructor (ID,name,dept_name,salary)
  2  values ('00012','llll','Physics',50000);

1 row created.

SQL>
SQL> connect namisa/123456;
Connected.
SQL> drop user hod1 cascade;

User dropped.

SQL> show user;
USER is "NAMISA"
```

```sql
--admin role
create user admin1 identified by adminpass;
grant create session , resource , create tablespace to admin1;
grant admin to admin1;
connect admin1/adminpass;
select * from namisa.department;
select * from namisa.instructor;
--won't work
select * from namisa.student;
update namisa.department
set budget=90000
where dept_name='Music';

connect namisa/123456;
drop user admin1 cascade;
show user;
```

```
USER IS  NAMISA
SQL> --admin role
SQL> create user admin1 identified by adminpass;

User created.

SQL> grant create session, resource, create tablespace to admin1;

Grant succeeded.

SQL> grant admin to admin1;

Grant succeeded.

SQL> connect admin1/adminpass;
Connected.
SQL> select * from namisa.department;

DEPT_NAME            BUILDING            BUDGET
-------------------- ---------------- ----------
Biology             Watson               90000
Comp. Sci.          Taylor              100000
Elec. Eng.          Taylor               85000
Finance             Painter             120000
History             Painter              50000
Music               Packard              90000
Physics             Watson               70000

7 rows selected.

SQL> select * from namisa.instructor;

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
00009 llll                 Physics               50000
00011 llll                 Physics               50000
00012 llll                 Physics               50000

15 rows selected.

SQL> --won't work
SQL> select * from namisa.student;
select * from namisa.student
                     *
ERROR at line 1:
ORA-00942: table or view does not exist
```

```
SQL> update namisa.department
  2  set budget=90000
  3  where dept_name='Music';

1 row updated.

SQL>
SQL> connect namisa/123456;
Connected.
SQL> drop user admin1 cascade;

User dropped.

SQL> show user;
USER is "NAMISA"
```

3   Challenges

In this lab, the biggest challenge was to fix the errors. After writing the state-
ments and thinking that they'll work by theory they didn't execute without
errors. Only after checking the console could I fix them fully. Granting priv-
ileges was confusing as well since we had limited knowledge on which grant
was for which privileges.