Course Number and Name: CSE 4308 Database Management Systems Lab	
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Task 1

Problem Statement:

Create a user with username = <student_id> and password = cse4308 and grant necessary privileges to log in and execute DDL and DML statements. Then log in as that user.

Analysis of the problem:

Create session, resource and unlimited tablespace were the privileges granted.

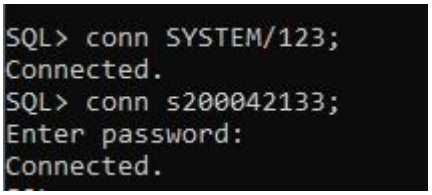
SQL Query:

```
conn SYSTEM/123;

CREATE USER 200042133 IDENTIFIED BY cse4308;
GRANT CREATE TABLE, RESOURCE, UNLIMITED TABLESPACE to 200042133;

conn 200042133/cse4308;
```

Any problems faced and how it was solved:

Since the task was straightforward and necessary instructions were provided, there was no difficulty faced.

Results:



Task 2

Problem Statement:

Write SQL statement to create a table 'STUDENT' which has 4 attributes:
- ID
- NAME
- DEPT_NAME
- TOT_CRED

Analysis of the problem:

ID is defined as int and the primary key, for distinguishing every record. Name is varchar2 of length 20 and Department Name is varchar2 of length 10. Finally, Total Credit is defined as int. Drop table instruction ensures if there's an existing table, it will be deleted.

SQL Query:

```
DROP TABLE STUDENT;

create table STUDENT(
        ID int primary key,
        NAME varchar2(20),
        DEPT_NAME varchar2(10),
        TOT_CRED int
);
```

Any problems faced and how it was solved:

Since the query was run multiple times, there were errors of duplicate entries since ID is the primary key. Using drop table query, this was solved so any previous existing table was deleted each time.

Results:

```
SQL> DROP TABLE STUDENT;

Table dropped.

SQL>
SQL> create table STUDENT(
  2  ID int primary key,
  3  NAME varchar2(20),
  4  DEPT_NAME varchar2(10),
  5  TOT_CRED int
  6  );

Table created.
```

Task 3

Problem Statement:

Write SQL statements to insert the following records into 'STUDENT' table:

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.	5
55739	Sanchez	Music	38
70557	Snow	Physics	0
76543	Brown	Comp. Sci.	58
76653	Aoi	Elec. Eng.	60
98765	Bourikas	Elec. Eng.	9
98988	Tanaka	Biology	120

Analysis of the problem:

Individually writing insert statements for each records will add it to the previously created table STUDENT.

SQL Query:

```
insert into STUDENT values(00128, 'Zhang', 'Comp. Sci.', 102);
insert into STUDENT values(12345, 'Shankar', 'Comp. Sci.', 32);
insert into STUDENT values(19991, 'Brandt', 'History', 80);
insert into STUDENT values(23121, 'Chavez', 'Finance', 110);
insert into STUDENT values(44553, 'Peltier', 'Physics', 56);
insert into STUDENT values(45678, 'Levy', 'Physics', 46);
insert into STUDENT values(54321, 'Williams', 'Comp. Sci.', 5);
insert into STUDENT values(55739, 'Sanchez', 'Music', 38);
insert into STUDENT values(70557, 'Snow', 'Physics', 0);
insert into STUDENT values(76543, 'Brown', 'Comp. Sci.', 58);
insert into STUDENT values(76653, 'Aoi', 'Elec. Eng.', 60);
insert into STUDENT values(98765, 'Bourikas', 'Elec. Eng.', 9);
insert into STUDENT values(98988, 'Tanaka', 'Biology', 120);
```

Any problems faced and how it was solved:

The queries were repetitive and there were chances of wrong typing since it was done manually. Thus the entries had to be double checked.

Results:

```
SQL> insert into STUDENT values(00128, 'Zhang', 'Comp. Sci.', 102);

1 row created.

SQL> insert into STUDENT values(12345, 'Shankar', 'Comp. Sci.', 32);

1 row created.

SQL> insert into STUDENT values(19991, 'Brandt', 'History', 80);

1 row created.

SQL> insert into STUDENT values(23121, 'Chavez', 'Finance', 110);

1 row created.

SQL> insert into STUDENT values(44553, 'Peltier', 'Physics', 56);

1 row created.

SQL> insert into STUDENT values(45678, 'Levy', 'Physics', 46);

1 row created.

SQL> insert into STUDENT values(54321, 'Williams', 'Comp. Sci.', 5);

1 row created.

SQL> insert into STUDENT values(55739, 'Sanchez', 'Music', 38);

1 row created.

SQL> insert into STUDENT values(70557, 'Snow', 'Physics', 0);

1 row created.

SQL> insert into STUDENT values(76543, 'Brown', 'Comp. Sci.', 58);

1 row created.

SQL> insert into STUDENT values(76653, 'Aoi', 'Elec. Eng.', 60);

1 row created.
```

```
SQL> insert into STUDENT values(98765, 'Bourikas', 'Elec. Eng.', 9);

1 row created.

SQL> insert into STUDENT values(98988, 'Tanaka', 'Biology', 120);

1 row created.
```

Task 4

Problem Statement:

Write SQL statements to perform the following queries:

(a) Display all records of 'STUDENT' table.

(b) Show student ID and name only.

(c) Find name and department of students who have completed more than 100 credits.

(d) Find name and department of students who have completed in between 80 and 120 credits (inclusive).

(e) Find ID and name of students of Comp. Sci. department.

(f) Find name and total credit of students of Physics department.

(g) Find ID and name of students of Comp. Sci. department or students who have completed less than 10 credits.

(h) Find the names of the department.

Analysis of the problem:

For each case, the correct condition included in the query will give the correct results.

SQL Query:

```
select * from STUDENT;

select ID, NAME from STUDENT;

select NAME, DEPT_NAME from STUDENT where TOT_CRED>100;

select NAME, DEPT_NAME from STUDENT where TOT_CRED>=80 AND
TOT_CRED<=120;

select ID, NAME from STUDENT where DEPT_NAME='Comp. Sci.';

select NAME, TOT_CRED from STUDENT where DEPT_NAME='Physics';

select ID, NAME from STUDENT where DEPT_NAME='Comp. Sci.' OR
TOT_CRED<10;

select DEPT_NAME from STUDENT
GROUP BY DEPT_NAME;
```

Any problems faced and how it was solved:

The queries were straightforward thus there was no problems faced. Additional help was taken from internet about the group by and multiple condition query syntax.

Results:

(a)

```
SQL> select * from STUDENT;

        ID NAME                 DEPT_NAME    TOT_CRED
---------- -------------------- ---------- ----------
       128 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.          5
     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.          9
     98988 Tanaka               Biology           120

13 rows selected.
```

(b)

```
SQL> select ID, NAME from STUDENT;

        ID NAME
---------- --------------------
       128 Zhang
     12345 Shankar
     19991 Brandt
     23121 Chavez
     44553 Peltier
     45678 Levy
     54321 Williams
     55739 Sanchez
     70557 Snow
     76543 Brown
     76653 Aoi

        ID NAME
---------- --------------------
     98765 Bourikas
     98988 Tanaka

13 rows selected.
```

(c)

```
SQL> select NAME, DEPT_NAME from STUDENT where TOT_CRED>100;

NAME                 DEPT_NAME
-------------------- ----------
Zhang                Comp. Sci.
Chavez               Finance
Tanaka               Biology
```

(d)

```
SQL> select NAME, DEPT_NAME from STUDENT where TOT_CRED>=80 AND TOT_CRED<=120;

NAME                 DEPT_NAME
-------------------- ----------
Zhang                Comp. Sci.
Brandt               History
Chavez               Finance
Tanaka               Biology
```

(e)

```
SQL> select ID, NAME from STUDENT where DEPT_NAME='Comp. Sci.';

        ID NAME
---------- --------------------
       128 Zhang
     12345 Shankar
     54321 Williams
     76543 Brown
```

(f)

```
SQL> select NAME, TOT_CRED from STUDENT where DEPT_NAME='Physics';

NAME                 TOT_CRED
-------------------- ----------
Peltier                      56
Levy                         46
Snow                          0
```

(g)

```
SQL> select ID, NAME from STUDENT where DEPT_NAME='Comp. Sci.' OR TOT_CRED<10;

        ID NAME
---------- --------------------
       128 Zhang
     12345 Shankar
     54321 Williams
     70557 Snow
     76543 Brown
     98765 Bourikas

6 rows selected.
```

(h)

```
SQL> select DEPT_NAME from STUDENT
  2  GROUP BY DEPT_NAME;

DEPT_NAME
----------
Elec. Eng.
Physics
Comp. Sci.
Finance
Biology
History
Music

7 rows selected.
```

Conclusion:

The lab contained a lot of basic information for learning database as well as how queries are executed based on the information required. Creating users who have different levels of privileges were interesting as well since limiting access is an important feature for a database.

In Lab 1, we had to write programs in different programming language for getting required information and there was no way to limit access to data. Lab 2 showed the difference in how easy it was to create different users as a way to partition data and 'hide' data.

It is very easy to control how much access each user will have. Retrieving required information was as smooth as typing a single line of query compared to writing a file of code. Any combination of information can be retrieved by a few lines of queries (at most).