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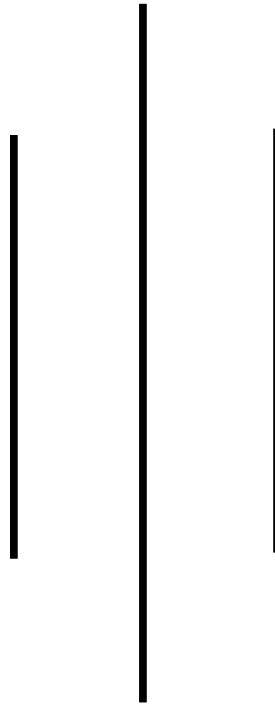
Database Administration

Lab: 3

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Configuring the user

```
SQL> CREATE USER DWIT IDENTIFIED BY dwit123;
User created.
SQL> GRANT DBA TO DWIT;
Grant succeeded.
```

Data Control Language (DCL)

It is a language used to control access to data stored in database.

a) GRANT

It allows specified users to perform specific tasks.

```
SQL> CREATE USER DWIT IDENTIFIED BY dwit123;
User created.
SQL> GRANT DBA TO DWIT;
Grant succeeded.
```

b) REVOKE

It cancels previously granted or denied permissions.

```
SQL> REVOKE DBA FROM DWIT;
Revoke succeeded.
```

Transaction Control Language (TCL)

It is a subset of SQL, used to control transactional processing in a database. A transaction is logical unit of work that comprises one or more SQL statements, usually a group of Data Manipulation Language (DML) statements.

a) **COMMIT**

It is used to apply the transaction by saving the database changes.

```
SQL> COMMIT;
Commit complete.
```

b) **ROLLBACK**

It is the process to undo all changes of a transaction.

```
SQL> INSERT INTO EMPLOYEES VALUES('RAM',5000);
1 row created.
SQL> INSERT INTO EMPLOYEES VALUES('HARI',8000);
1 row created.
SQL> SELECT * FROM EMPLOYEES;
NAME
                      !    SALARY
-----------------------------------------------------------------
--------------------!----------
sagar
                      !       5000
RAM
                      !       5000
HARI
                      !       8000
SQL> ROLLBACK;
Rollback complete.
SQL> SELECT * FROM EMPLOYEES;
no rows selected
```

c) **SAVEPOINT**

It is used to divide the transaction into smaller sections. It defines breakpoints for a transaction to allow partial rollbacks.

```
SQL> INSERT INTO EMPLOYEES VALUES('HARI',8000);
1 row created.
SQL> INSERT INTO EMPLOYEES VALUES('RAM',5000);
1 row created.
SQL> SAVEPOINT INPUTS;
Savepoint created.
SQL> SELECT * FROM EMPLOYEES;
NAME
                       :     SALARY
----------------------------------------------------------------------
--------------------:----------
HARI
                       :         8000
RAM
                       :         5000
SQL> INSERT INTO EMPLOYEES VALUES('SAGAR',8000);
1 row created.
SQL> SELECT * FROM EMPLOYEES;
NAME
                       :     SALARY
----------------------------------------------------------------------
--------------------:----------
HARI
                       :         8000
RAM
                       :         5000
SAGAR
                       :         8000
SQL> ROLLBACK TO SAVEPOINT INPUTS;
Rollback complete.
SQL> SELECT * FROM EMPLOYEES;
NAME
                       :     SALARY
----------------------------------------------------------------------
--------------------:----------
HARI
                       :         8000
RAM
                       :         5000
```

Data Definition Language (DDL)

It is a language for defining data structures, especially database schemas.

a) **CREATE**

It is used to establish a new database, table, index or stored procedure.

```
SQL> CREATE TABLE EMPLOYEES (
  2  NAME VARCHAR(100),
  3  SALARY INT);

Table created.
```

b) **ALTER**

It is used to modify the existing database object.

```
SQL> ALTER TABLE EMPLOYEES ADD AGE INT;

Table altered.

SQL> SELECT * FROM EMPLOYEES;

NAME
                         !    SALARY!         AGE
------------------------------------------------------------
------------------------!----------!----------
HARI
                         !      8000!
RAM
                         !      5000!
```

c) **DROP**

It is used to remove a table from database. The table's entire row, indexes will also be removed. This operation can be rolled back.

```
SQL> ALTER TABLE EMPLOYEES DROP COLUMN AGE;

Table altered.

SQL> SELECT * FROM EMPLOYEES;

NAME
                         !    SALARY
------------------------------------------------------------
------------------------!----------
HARI
                         !      8000
RAM
                         !      5000
```

d) RENAME

It is used to rename a database table.

```
SQL> ALTER TABLE EMPLOYEES RENAME COLUMN SALARY TO SALARIES;
Table altered.
SQL> SELECT * FROM EMPLOYEES;
NAME
                        :  SALARIES
--------------------------:----------------------------------------------------
HARI
                        :      8000
RAM
                        :      5000
```

e) TRUNCATE

It removes all the rows from a table. The operation cannot be rolled back.

```
SQL> TRUNCATE TABLE EMPLOYEES;
Table truncated.
SQL> SELECT * FROM EMPLOYEES;
no rows selected
```

f) COMMENT

It is used to make easier to read and maintain.

```
SQL> SELECT * FROM EMPLOYEES /* this is comment*/;
no rows selected
```

DATA MANIPULATION LANGUAGE (DML)

It is a type of language used for selecting, deleting and updating data in database. It is used to retrieve and manipulate data in relational database.

a) **SELECT**

It returns a result set of records from one or more database tables.

```
SQL> select * from student;

NAME                                               ROLL
-------------------------------------------------- ----------
EMAIL                           ADDRESS
------------------------------- ------------------------------------------
Sumit                                              209
sumit.shrestha@deerwalk.edu.np  Samakhusi

Amar Singh                                         221
amar.singh@deerwalk.edu.np      Gokarna
```

b) **INSERT**

It adds one or more records to any single table in a relational database.

```
SQL> INSERT INTO EMPLOYEES VALUES('SAGAR',8000);

1 row created.

SQL> INSERT INTO EMPLOYEES VALUES('RAM',5000);

1 row created.

SQL> SELECT * FROM EMPLOYEES;

NAME
                        : SALARIES
------------------------------------------------------------
----------------------:----------
SAGAR
                        :      8000
RAM
                        :      5000
```

c) UPDATE

It changes the data of one or more records in a table.

```
SQL> update Student
  2   set Name='Anail' where Name = 'Anil';

1 row updated.
```

d) DELETE

It removes one or more records from a table.

```
SQL> DELETE FROM EMPLOYEES WHERE NAME='SAGAR';

1 row deleted.
SQL> SELECT * FROM EMPLOYEES;

NAME
                         !  SALARIES
--------------------------------------------------------------
--------------------!-----------
RAM
                         !      5000
```