Indian Institute of Information Technology Sri City
Database Management Systems LAB-02
TOPIC: DDL and DML queries

Structured Query Language (SQL):

- SQL is database language used to create a database, describe the database schema and to carry out certain operations on a database

SQL Commands

- SQL commands are instructions which are used to communicate with the database. It is also used to perform specific tasks, functions, and queries of data.

- SQL can perform various tasks like create a table, add data to tables, drop the table, modify the table, set permission for users.

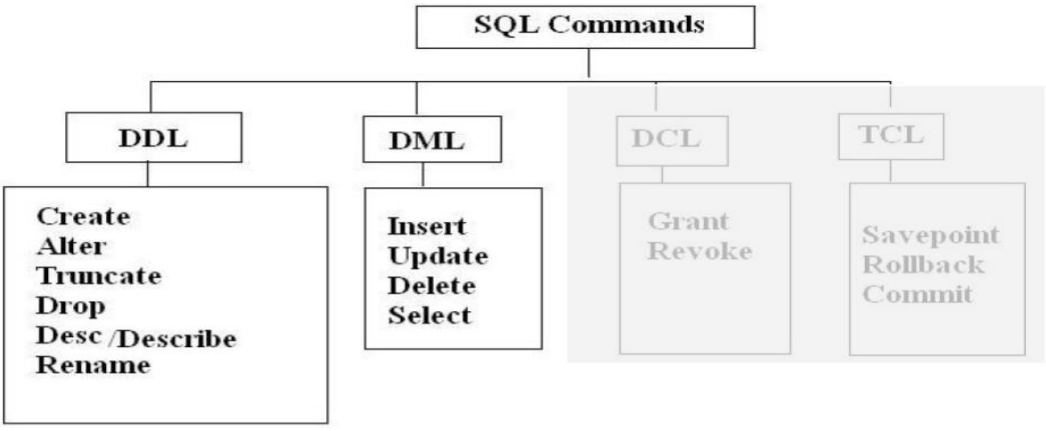
Types of SQL Commands

1. DDL:

   DDL is the short name of Data Definition Language, which deals with database schemas and descriptions, of how the data should reside in the database.

2. DML:

   DML is the short name of Data Manipulation Language which deals with data manipulation and includes most common It is used to store, modify, retrieve, delete and update data in a database.



BASIC DATA TYPES:

- **char(n)** : A FIXED length string (can contain letters, numbers, and special characters) . The *size* parameter specifies the column length in characters - can be from 0 to 255. Default is 1
- **varchar(n)** : A VARIABLE length string (can contain letters, numbers, and special characters). The *size* parameter specifies the maximum column length in characters - can be from 0 to 65535
- **int** :A medium integer. Allows whole numbers between -2,147,483,648 and 2,147,483,647
- **bigint** :A large integer. Allows whole numbers between -9,223,372,036,854,775,808 and 9,223,372,036,854,775,807
- **decimal(m,p)** :An exact fixed-point number. Allows numbers from -10^38 +1 to 10^38 – 1.The total number of digits is specified in *size*. The number of digits after the decimal point is specified in the *d* parameter. The maximum number for *size* is 65. The maximum number for *d* is 30. The default value for *size* is 10. The default value for *d* is 0.
- **Date :** A date. Format: **YYYY-MM-DD**. The supported range is from '1000-01-01' to '9999-12-31'
- **Year :** A year in four-digit format. Values allowed in four-digit format: 1901 to 2155, and 0000.

Note that for more *data types*, you can see the reference books.

DDL

Creating Database:

➢ CREATE DATABASE *databasename;*

Drop Database:

DROP DATABASE *databasename*;

View all Databases:

SHOW DATABASES;

(optional)Backup Database:

BACKUP DATABASE *databasename* TO DISK = '*filepath*';

Selecting Database: Use *databasename*;

Create Table:

CREATE TABLE *table_name* (*col1 datatype,col2 datatype,*
col3 datatype,....);

ex:CREATE TABLE Persons (PersonID int,Name varchar(255),Gender char(n));

Drop Table:

DROP TABLE *table_name*;

Truncate Table:

TRUNCATE TABLE *table_name*;

Alter Table:

1.Add column

ALTER TABLE *table_name* ADD *column_name datatype*;

2.Drop column

ALTER TABLE *table_name* DROP COLUMN *column_name*;

3.Modify column

ALTER TABLE *table_name* MODIFY COLUMN *column_name datatype*;

4.Modify table name(Rename)

ALTER TABLE *table_name* RENAME *new_table_name*;

Few examples of table creation

```
CREATE TABLE Persons (
    ID int NOT NULL,
    LastName varchar(255) NOT NULL,
    FirstName varchar(255),
    Age int,
    UNIQUE (ID)
    );

CREATE TABLE Persons (
    ID int NOT NULL,
    LastName varchar(255) NOT NULL,
    FirstName varchar(255),
    Age int,
    CONSTRAINT UC_Person UNIQUE (ID,LastName)
    );
```

```
ALTER TABLE Persons
ADD UNIQUE (ID);

ALTER TABLE Persons
ADD CONSTRAINT UC_Person UNIQUE (ID,LastName);

ALTER TABLE Persons
DROP INDEX UC_Person;
```

DML

Insert Data:

INSERT INTO *table_name* (*column1*, *column2*, *column3*, ...)
VALUES (*value1*, *value2*, *value3*, ...);

INSERT INTO *table_name*
VALUES (*value1*, *value2*, *value3*, ...);

Display contents of a Table:

SELECT *column1*, *column2, …* FROM *table_name*;

SELECT * FROM *table_name*;

SELECT *column1*, *column2*, ...FROM *table_name* WHERE *condition*;

Note: Operators used in WHERE clause: >, >=, <, <=, =, <>,and, or, in not in, between..and, not between..and.., like '%', like '_',is null, is not null

Update contents of a Table:

UPDATE *table_name* SET *column1 = value1*, *column2 = value2*, …
WHERE *condition*;

Delete contents of a Table:

DELETE FROM *table_name* WHERE *condition*;

Few examples of DML commands

- SELECT * From emp where SAL>3000
- SELECT * from emp where job='MANAGER' or job='CLERK'
- SELECT * FROM emp WHERE job IN ('MANGER', 'CLERK'');

- SELECT * FROM emp WHERE job NOT IN ('MANGER', 'CLERK'');
- SELECT ENAME, JOB FROM EMP WHERE SAL BETWEEN 3000 AND 5000;
- SELECT * FROM EMP WHERE ENAME LIKE '%E%';
- SELECT * FROM EMP WHERE ENAME LIKE '_E%';
- SELECT * FROM EMP WHERE NOT (job IS NULL);
- SELECT * FROM EMP WHERE job='CLERK' AND deptno=10
- SELECT * FROM emp WHERE job='CLERK' OR deptno=10

LAB EXERCISES

Q1. Create the following table: Customer

columnname	datatype	size
Cust_ID	varchar2	5
name	varchar2	30
city	varchar2	15
state	varchar2	15
pincode	number	6
products	varchar2	40
price	number	10

Note: ID must be unique, names and products can be repeated.

1(a)- Insert the data into the table.

1 (b) On the basis of above two tables answer the following Questionnaires:

1. Find out the names of all the clients (without duplicates).
2. Retrieve the list of names and cities of all the customers.
3. List the available products whose name begin with ‘t’.
4. List all the clients who are in Chennai.
5. Display the information for clients with ID C109 and C105 (Assume Ids are present in the table).
6. Find all the products whose sell price is greater than 4000.
7. Find the list of all customer IDs who stay in city ‘Hyderabad’ or city ‘pune’ or ‘Delhi’.
8. Find the product whose selling price is greater than 2000 and less than or equal to 5000.
9. List the name, city and state of clients not in the state of ‘Maharashtra’.
10. Modify customer name “John” as “Johney”.

Q2:

1. Create following table in the database ‘business’
    1. employee (emp_no,emp_name, doj, ph_no, dept_name, designation,salary)
2. Load data from the text file
3. Add 3 to 5 rows in the employee, following below conditions
    a. Dept_names:’sales’ ,’HR’,’Marketing’,’Accounts’
    b. Designation: ‘Sales manager’,’HR’,”sales representative’, ’CA’, ’Typist’, ’Receptionist’
4. Display all the records from the above table
5. Display the empno and name of all the employees from department name ending with ‘s’
6. Display the empno and name of all employees whose salary is between 2000 and 5000
7. Display all designations starting with ‘sales’
8. Change the salary of employees to 25000 whose designation is ‘Typist’
9. Change the mobile no of employee named ‘john’
10. Give all the receptionists 10% hike
11. Find the employees whose mobile number is not mentioned
12. Delete all employees whose salaries are greater than Rs.7000
13. Truncate the table
14. Display the table structure

References:

1. Silberschatz, H. Korth & S. Sudarshan, Database System Concepts, McGraw-Hill Education, 6th Edition, 2010.
2. 2.R. Elmasri & S.B. Navathe, Fundamentals of Database Systems, Pearson Education, 6th edition, 2010.