Oracle-SQL*Plus

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What is SQL?

SQL (Structured Query Language) is a standard language used to interact with relational databases. It is used to perform tasks like querying data, updating records, creating and altering database structures, and managing user access.

Interacting with SQL using SQL*Plus

- SQL*Plus is a **command-line tool** provided by Oracle to run SQL and PL/SQL commands.
- You can start it by running `sqlplus` command in terminal or command prompt and logging in with username and password.
- You type SQL commands, which are executed immediately or as scripts.
- SQL*Plus supports scripting features such as variables, loops, and formatting of query outputs.

Rules for SQL Statements

- SQL keywords are **not case-sensitive** but typically written in uppercase for readability.
- SQL statements should **end with a semicolon `;`** in SQL*Plus to execute.
- Strings should be enclosed in **single quotes `'`**.
- **Identifiers** (such as **table and column names**) can be **quoted using double quotes `"`,** though usually unnecessary.
- SQL **keywords, identifiers,** and **strings** have specific syntax that must be adhered to, else errors occur.
- Comments can be added using `--` for single line or `/* ... */` for multi-line.

Standard SQL Statement Groups

SQL commands can be grouped into several functional categories:

1. Data Query Language (DQL)

- Used to query data from the database.
- The main statement is `SELECT`.

Example:

```sql
SELECT EmpName, DeptID FROM Employees WHERE DeptID = 10;
```

Fetches employee names and department IDs where department is 10.

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2. Data Definition Language (DDL)

- Commands to create, alter, and drop database objects like tables, indexes, views.

Examples:

```sql
CREATE TABLE Employees (
  EmpID NUMBER PRIMARY KEY,
  EmpName VARCHAR2(50),
  DeptID NUMBER
);

ALTER TABLE Employees ADD (Salary NUMBER);

DROP TABLE Employees;
```

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3. Data Manipulation Language (DML)

- Commands to insert, update, delete data.

Examples:

```sql
INSERT INTO Employees (EmpID, EmpName, DeptID) VALUES (1,
'Rajesh Sharma', 10);
```

```
UPDATE Employees SET DeptID = 20 WHERE EmpName = 'Rajesh
Sharma';

DELETE FROM Employees WHERE EmpID = 1;
```

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4. Transaction Control Language (TCL)

● Commands to control transactions (units of work).

Examples:

```
COMMIT; -- Save changes permanently
ROLLBACK; -- Undo changes not saved
SAVEPOINT save1; -- Create savepoint in transaction
```

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5. Data Control Language (DCL)

● Commands to grant and revoke access.

Examples:

```
GRANT SELECT ON Employees TO user1;

REVOKE INSERT ON Employees FROM user1;
```

Step-by-step Example Using SQL*Plus

1. Connect to SQL*Plus:

```
sqlplus username/password@dbname
```

2. Create a table:

```
CREATE TABLE Employees (
```

```sql
    EmpID NUMBER PRIMARY KEY,
    EmpName VARCHAR2(50),
    DeptID NUMBER
);
```

3. Insert data:

```sql
INSERT INTO Employees VALUES (1, 'Rajesh Sharma', 10);
INSERT INTO Employees VALUES (2, 'Priya Singh', 20);
COMMIT;
```

4. Query data:

```sql
SELECT EmpID, EmpName FROM Employees;
```

5. Update data:

```sql
UPDATE Employees SET DeptID = 30 WHERE EmpID = 2;
COMMIT;
```

6. Delete data:

```sql
DELETE FROM Employees WHERE EmpID = 1;
COMMIT;
```

7. Exit SQL*Plus:

```sql
EXIT;
```

This provides a structured overview of SQL usage with SQL*Plus in Oracle, the definition of SQL, rules, and the main groups of SQL statement types with syntax examples.

If desired, specific examples for each SQL statement group using Indian data can be provided.

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