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CSC-207: Database Systems

Lab # 04: Exploring TCL & DQL Statements

Objectives

1. TCL commands
2. SQL foundation statements

Transaction control language or TCL

- commands deal with the transactions within the database.
- Transaction Control Language—as its name suggests—is used to control the actions done by other non-auto-committed commands such as INSERT, DELETE and UPDATE.
- DML commands are not auto-committed so TCL commands can be used with the DML.

1. COMMIT

This is used for saving every transaction to the database.

```
DELETE FROM VENDOR
WHERE AGE = 29;
COMMIT;
```

2. ROLLBACK

This command aims to undo the transactions that are not saved to the database.

DELETE **FROM VENDOR**
WHERE AGE = 29;
ROLLBACK;

3. **SAVEPOINT**

This is used for returning a transaction to a specific point without affecting the whole transaction.

SAVEPOINT SAVEPOINT_NAME;

Data Query Language (DQL)

- It is used to fetch the data from the database.
- DQL is used to fetch the data from the database. SELECT is the only and essential command widely and commonly used by all data analysts and scientists.

1. SELECT

The prime purpose of this statement is to get data from a database. Every query will begin with SELECT, followed by the names of columns you want to get from the table.

A particular column from the table can be selected with,

SELECT column_name FROM table_name;
And all the columns can be determined by using * as shown below,

SELECT * FROM table_name;

SQL foundation statements

1. USE Statement

To select a particular database to work with you issue the USE statement as follows:

USE database_name;

In this statement, following the USE keyword is the name of the database that you want to select.

2. SELECT Statement

The SELECT statement is used to select data from a database. The data returned is stored in a result table, called the result-set. A SELECT indicates that we are merely reading information, as opposed to modifying it. What we are selecting is identified by an expression or column list immediately following the SELECT. The FROM statement specifies the name of the table or

tables from which we are getting our data.

When you want to select particular fields available in the table, use the following syntax:

SELECT column1, column2, ...

FROM table_name;

Example:

SELECT FirstName, LastName

FROM Employees;

Selects data of these two columns from the Employees table

When you want to select all the fields available in the table, use the following syntax:

SELECT *

FROM table_name;

Example:

SELECT *

FROM Employees;

Selects all the employees records from the database and displays its columns.

3. DISTINCT Statement

The SELECT DISTINCT statement is used to return only distinct (different) values.

Inside a table, a column often contains many duplicate values; and sometimes you only want to list the different (distinct) values.

Syntax:

SELECT DISTINCT column1, column2, ...

FROM table_name;

4. SELECT Top Clause

The SELECT TOP clause is used to specify the number of records to return.

The SELECT TOP clause is useful on large tables with thousands of records. Returning a large number of records can impact performance.

Note: Not all database systems support the SELECT TOP clause. MySQL supports the LIMIT clause to select a limited number of records while Oracle uses ROWNUM.

MYSQL Syntax:

SELECT *

FROM table_name

LIMIT number;

The OFF SET value is also most often used together with the LIMIT keyword. The OFF SET value allows us to specify which row to start from retrieving data.

LIMIT with OFFSET Syntax:

SELECT *

FROM table_name

LIMIT OFFSET, number;

5. Functions with SELECT Statement

There are some functions that can be used in select statement.

Syntax:

SELECT function_name()

FROM table_name;

Functions are:

- MIN
- MAX
- AVG
- SUM
- COUNT
- UPPER
- LOWER
- LENGTH
- etc

6. Aliases

SQL aliases are used to give a table, or a column in a table, a temporary name. Aliases are often used to make column names more readable.

An alias only exists for the duration of the query.

Alias Column Syntax:

SELECT column_name AS alias_name

FROM table_name;

Alias Table Syntax:

SELECT column_name(s)

FROM table_name AS alias_name;

7. ORDER BY Keyword

The ORDER BY keyword is used to sort the result-set in ascending or descending order.

The ORDER BY keyword sorts the records in ascending order by default. To sort the records in descending order, use the DESC keyword.

Syntax:

SELECT column_name(s)

FROM table_name

ORDER BY column1, column2, ... ASC|DESC

Exercises (Class)

Add here all the tasks performed in lab.

Exercises (Weekly)

1. Write a query to display the names (first_name, last_name) using the alias name “First Name", "Last Name".
2. Write a query to get a unique department ID from the employee table.
3. Write a query to get all employee details from the employee table order by the first name, descending.
4. Write a query to get the employee ID, names (first_name, last_name), salary in ascending order of salary.
5. Write a query to get the total salaries payable to employees.
6. Write a query to get the maximum and minimum salary from the employee's table.
7. Write a query to get the average salary and number of employees in the employees' table.
8. Write a query to get the number of jobs available in the employee's table.

9. Write a query to get all first names from the employee's table in the upper case.
10. Write a query to select the first 10 records from a table.
11. Write a query to select the 3rd & 4th records of the employee's table.
12. Write a query to select 2nd last record of the employee's table.