Database Management System
(DCO-412)

Practical No: 01
Practical Name: Write in detail about the Query (SQL Language) and also write name of DDL and DML commands.

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Session: 2018-2019

Query:

A query is a request for data or information from a database table or combination of tables. This data may be generated as results returned by Structured Query Language (SQL) or as pictorials, graphs or complex results, e.g., trend analyses from data-mining tools.

One of several different query languages may be used to perform a range of simple to complex database queries. SQL, the most well-known and widely-used query language, is familiar to most database administrators (DBAs).

The query database feature is equal in necessity to data storage capability. Thus, a number of query languages have been developed for different database engines and purposes, but SQL is by far the most ubiquitous and well-known. In fact, rookie database administrators often are surprised when they learn about the existence of other query languages, somewhat akin to how native English-speaking children are perplexed when hearing a foreign language for the first time. The element of surprise in both scenarios leads to a better understanding of other languages.

Query languages generate different data types according to function. For example, SQL returns data in neat rows and columns and is very similar to Microsoft Excel in appearance.

Other query languages generate data as graphs or other complex data manipulations, e.g., data mining, which is the deep analysis of information that uncovers previously-unknown trends and relationships between distinct or divergent data. For example, a SQL manufacturing company query may reveal that monthly sales peak in June and July, or that female sales representatives continually outperform male counterparts during holiday months.

SQL (Structured Query Language):

Structured Query Language (SQL) is a standard computer language for relational database management and data manipulation. SQL is used to query, insert, update and modify data. Most relational databases support SQL, which is an added benefit for database administrators (DBAs), as they are often required to support databases across several different platforms.

First developed in the early 1970s at IBM by Raymond Boyce and Donald Chamberlin, SQL was commercially released by Relational Software Inc. (now known as Oracle Corporation) in 1979. The

current standard SQL version is voluntary, vendor-compliant and monitored by the American National Standards Institute (ANSI). Most major vendors also have proprietary versions that are incorporated and built on ANSI SQL, e.g., SQL*Plus (Oracle), and Transact-SQL (T-SQL) (Microsoft).

SQL Language Elements:

1. **Clauses:** The clauses are components of the statements and the queries.
2. **Expressions:** The expressions can produce scalar values of tables, which consist of columns and row of data.
3. **Predicates:** They specify conditions, which are used to limit the effects of the statements and the queries, or the change program flow.
4. **Queries:** A query will retrieve data, based on a given criteria.
5. **Statements:** With the statements one can control transactions, program flow, connections, sessions or diagnostics. In data base systems the SQL statements are used for sending queries from a client program to a server where the databases are stored.

SQL Commands:

Structured Query Language (SQL) as we all know is the database language by the use of which we can perform certain operations on the existing database and also we can use this language to create a database. SQL uses certain commands like Create, Drop, Insert etc. to carry out the required tasks.

These SQL commands are mainly categorized into four categories as discussed below:

1. DDL (Data Definition Language)
2. DML (Data Manipulation Language)
3. DCL (Data Control Language)
4. TCL (transaction Control Language)

DDL (Data Definition Language):

DDL or Data Definition Language actually consists of the SQL commands that can be used to define the database schema. It simply deals with descriptions of the database schema and is used to create and modify the structure of database objects in database.

Examples of DDL commands:

- **CREATE –** is used to create the database or its objects (like table, index, function, views, store procedure and triggers).
- **DROP** – is used to delete objects from the database.
- **ALTER** - is used to alter the structure of the database.
- **TRUNCATE** – is used to remove all records from a table, including all spaces allocated for the records are removed.
- **COMMENT** – is used to add comments to the data dictionary.
- **RENAME** – is used to rename an object existing in the database.

DML (Data Manipulation Language):

The SQL commands that deals with the manipulation of data present in database belong to DML or Data Manipulation Language and this includes most of the SQL statements.

Examples of DML:

- **SELECT** – is used to retrieve data from the database.
- **INSERT** – is used to insert data into a table.
- **UPDATE** – is used to update existing data within a table.
- **DELETE** – is used to delete records from a database table.

DCL (Data Control Language):

DCL includes commands such as GRANT and REVOKE which mainly deals with the rights, permissions and other controls of the database system.

Examples of DCL commands:

- **GRANT** - gives user's access privileges to database.
- **REVOKE** - withdraw user's access privileges given by using the GRANT command.

TCL (transaction Control Language): TCL commands deals with the transaction within the database.

Examples of TCL commands:

- **COMMIT** – commits a Transaction.
- **ROLLBACK** – rollbacks a transaction in case of any error occurs.
- **SAVEPOINT** – sets a save point within a transaction.
- **SET TRANSACTION** – specify characteristics for the transaction.