# Introduction to SQL

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# SQL

- SQL (Structured Query Language) is used to perform operations on the records stored in the database, such as updating records, inserting records, deleting records, creating and modifying database tables, views, etc.
- SQL is not a database system, but it is a query language.
- Suppose you want to perform the queries of SQL language on the stored data in the database.
- You are required to install any database management system in your systems, for example, Oracle, MySQL, MongoDB, PostgreSQL, SQL Server, DB2, etc

# SQL

- SQL is a short-form of the structured query language, and it is pronounced as S-Q-L or sometimes as See-Quell.
- This database language is mainly designed for maintaining the data in relational database management systems.
- It is a special tool used by data professionals for handling structured data (data which is stored in the form of tables).
- It is also designed for stream processing in RDBMS.

# SQL

- You can easily create and manipulate the database, access and modify the table rows and columns, etc.
- This query language became the standard of ANSI in the year of 1986 and ISO in the year of 1987.
- If you want to get a job in the field of data science, then it is the most important query language to learn.
- Big enterprises like Facebook, Instagram, and LinkedIn, use SQL for storing the data in the back-end.

# SQL: Why?

- The basic use of SQL for data professionals and SQL users is to insert, update, and delete the data from the relational database.
- SQL allows the data professionals and users to retrieve the data from the relational database management systems.
- It also helps them to describe the structured data.
- It allows SQL users to create, drop, and manipulate the database and its tables.

# SQL: Why?

- It also helps in creating the view, stored procedure, and functions in the relational database.
- It allows you to define the data and modify that stored data in the relational database.
- It also allows SQL users to set the permissions or constraints on table columns, views, and stored procedures.

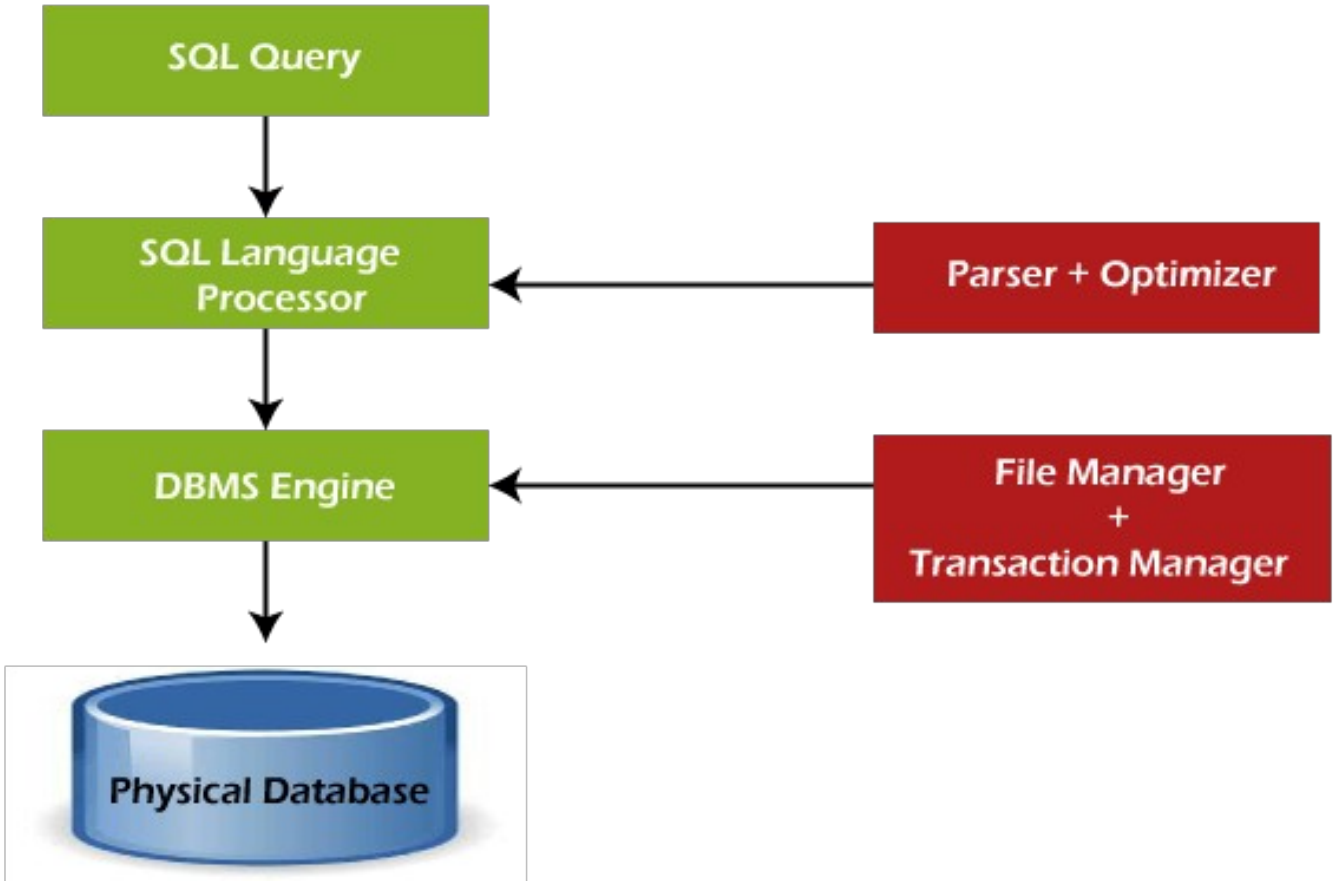
# SQL: When?

- "A Relational Model of Data for Large Shared Data Banks" was a paper which was published by the great computer scientist "E.F. Codd" in 1970.
- The IBM researchers Raymond Boyce and Donald Chamberlin originally developed the SEQUEL (Structured English Query Language) after learning from the paper given by E.F. Codd.
- They both developed the SQL at the San Jose Research laboratory of IBM Corporation in 1970.

# SQL: Process

- When we are executing the command of SQL on any Relational database management system, then the system automatically finds the best routine to carry out our request, and the SQL engine determines how to interpret that particular command.
- Structured Query Language contains the following four components in its process:
  - Query Dispatcher
  - Optimization Engines
  - Classic Query Engine
  - SQL Query Engine, etc.

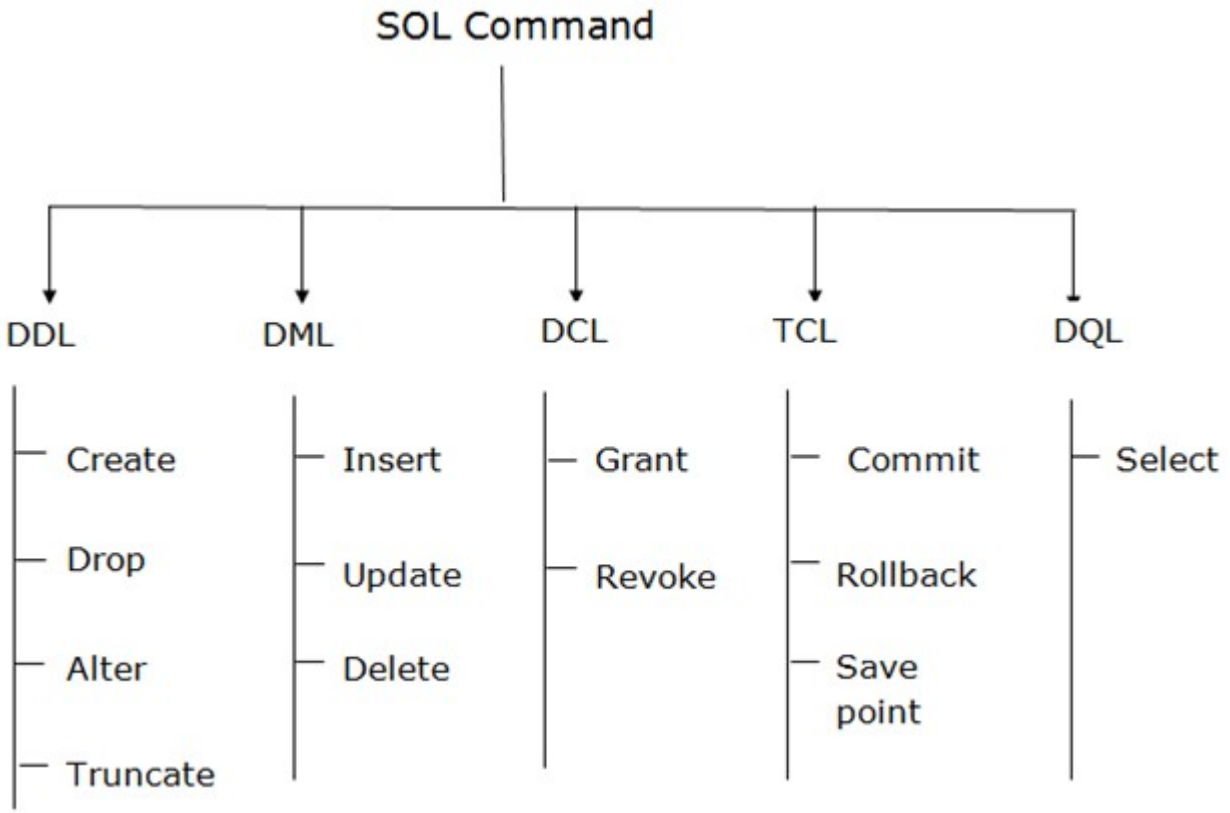
# SQL: Process


SQL Query
SQL Language Processor
Parser + Optimizer
DBMS Engine
File Manager + Transaction Manager
Physical Database

# SQL Commands

- SQL commands are instructions. It is 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.

# SQL Commands



# Data Definition Language

- DDL changes the structure of the table like creating a table, deleting a table, altering a table, etc.
- All the command of DDL are auto-committed that means it permanently save all the changes in the database.
- Here are some commands that come under DDL:
  - CREATE
  - ALTER
  - DROP
  - TRUNCATE

# Data Manipulation Language

- DML commands are used to modify the database. It is responsible for all form of changes in the database.
- The command of DML is not auto-committed that means it can't permanently save all the changes in the database. They can be rollback.
- Here are some commands that come under DML:
  - INSERT
  - UPDATE
  - DELETE

# Data Control Language

- DCL commands are used to grant and take back authority from any database user.
- Here are some commands that come under DCL:
  - Grant
  - Revoke

# Transaction Control Language

- TCL commands can only use with DML commands like INSERT, DELETE and UPDATE only.
- These operations are automatically committed in the database that's why they cannot be used while creating tables or dropping them.
- Here are some commands that come under TCL:
  - COMMIT
  - ROLLBACK
  - SAVEPOINT

# Data Query Language

- DQL is used to fetch the data from the database.
- It uses only one command:
  - SELECT

# Data Definition Language (DDL)

- CREATE
  - It is used to create a new table in the database.
- DROP:
  - It is used to delete both the structure and record stored in the table.
- ALTER:
  - It is used to alter the structure of the database. This change could be either to modify the characteristics of an existing attribute or probably to add a new attribute.
- TRUNCATE:
  - It is used to delete all the rows from the table and free the space containing the table.

# Thank you



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