Tikrit University

College of Computer Science and Mathematics

Department of Computer Science

Basic SQL Commands

Lec 5

2nd Stage

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What is SQL?

• SQL stands for Structured Query Language. It is used for storing and managing data in Relational Database Management System (RDBMS).

• It is a standard language for Relational Database System. It enables a user to create, read, update and delete relational databases and tables.

• All the RDBMS like MySQL, Informix, Oracle, MS Access and SQL Server use SQL as their standard database language.

• SQL allows users to query the database in a number of ways, using English-like statements.

What are the SQL?

SQL follows the following rules:

• Structure query language is not case sensitive. Generally, keywords of SQL are written in uppercase.

• Statements of SQL are dependent on text lines. We can use a single SQL statement on one or multiple text line.

• Using the SQL statements, you can perform most of the actions in a database.

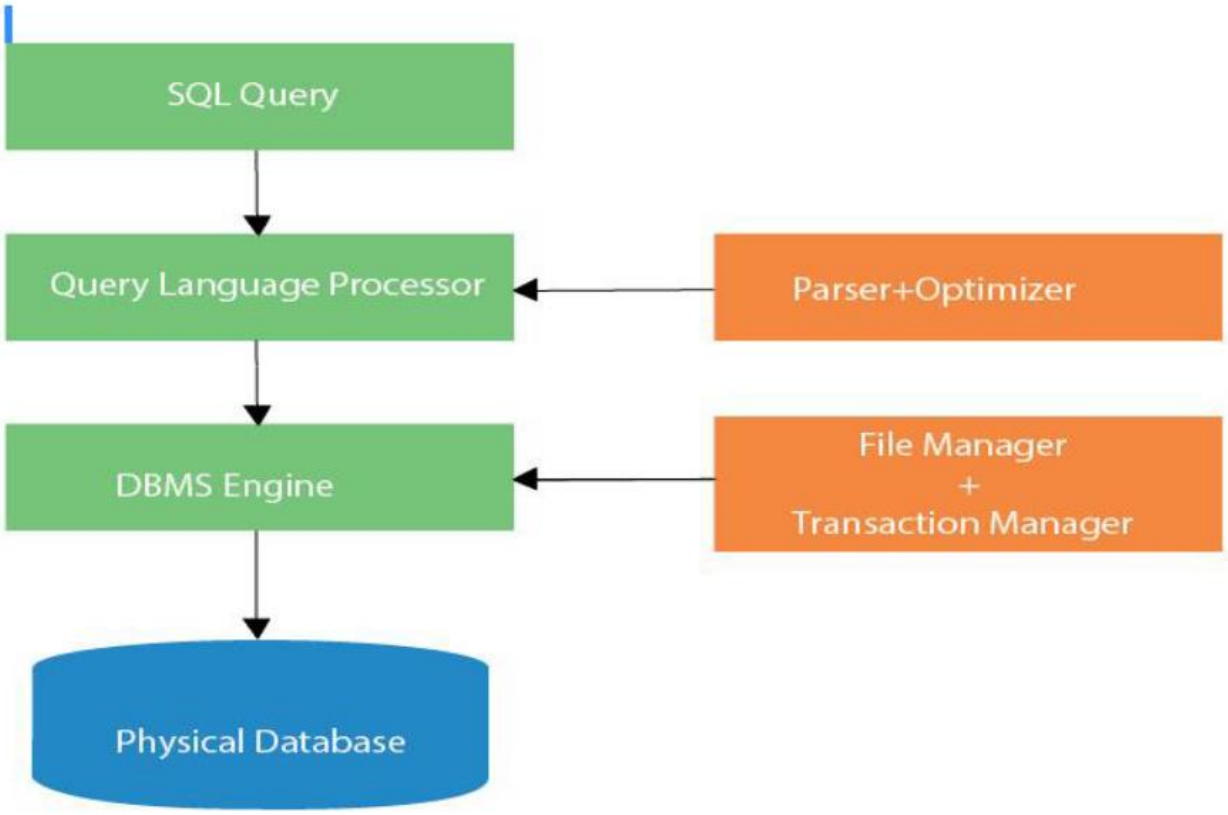
• SQL depends on tuple relational calculus and relational algebra.

What is SQL Process?

• When an SQL command is executing for any RDBMS, then the system figure out the best way to carry out the request and the SQL engine determines that how to interpret the task.

• In the process, various components are included. These components can be optimization Engine, Query engine, Query dispatcher, classic, etc.

• All the non-SQL queries are handled by the classic query engine, but SQL query engine won't handle logical files.

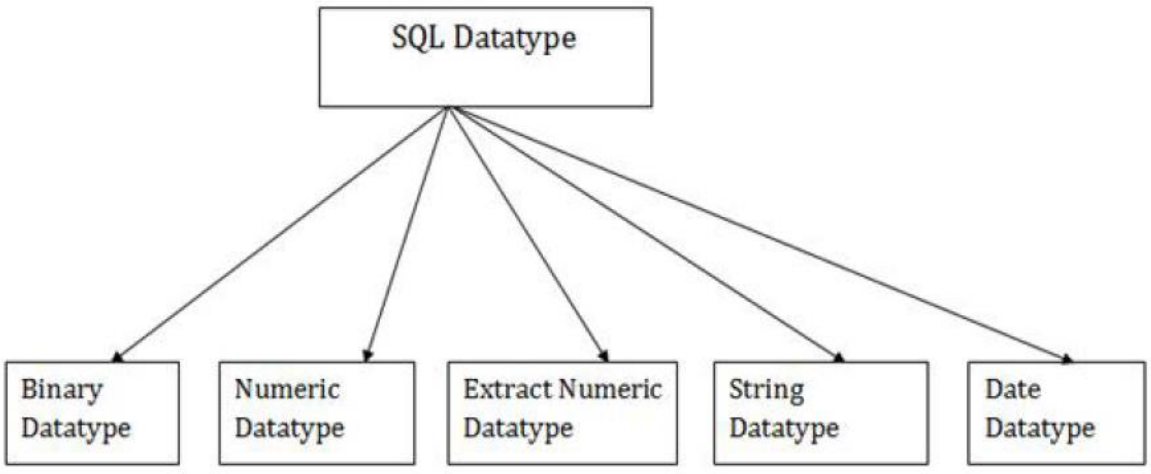


What is Advantages of SQL?

• High speed
• No coding needed
• Well defined standards
• Portability
• Interactive language
• Multiple data view

What is SQL Data type?

• SQL Data type is used to define the values that a column can contain.
• Every column is required to have a name and data type in the database table.

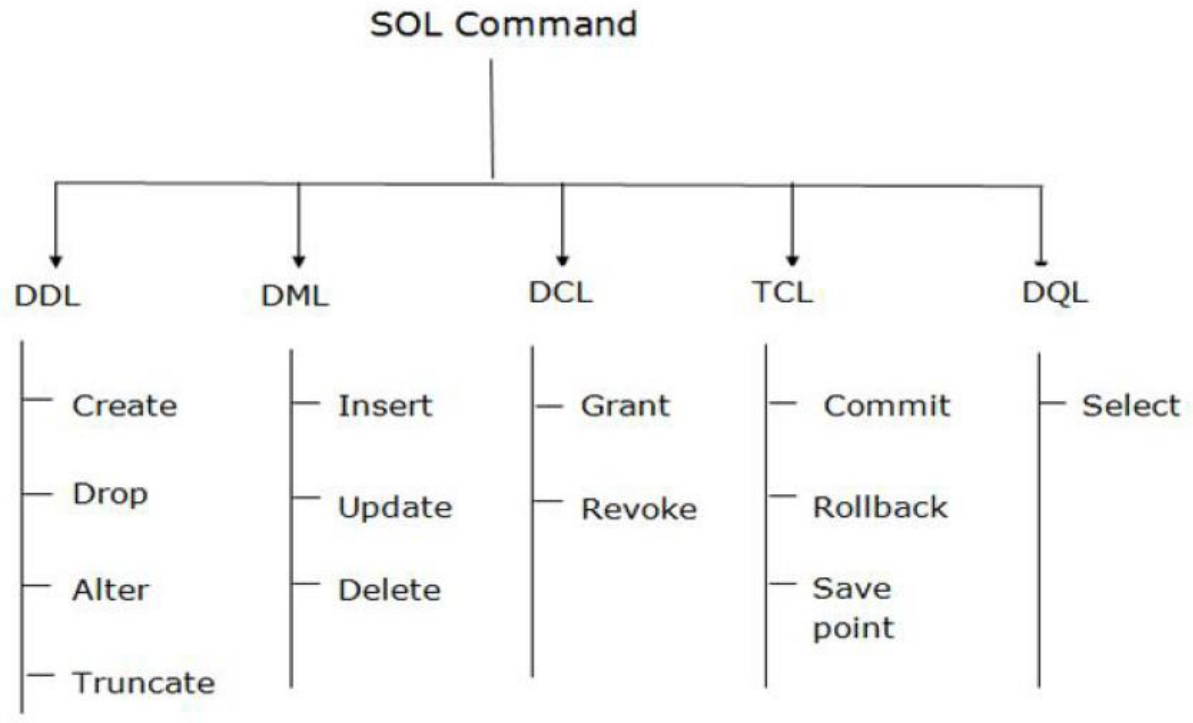


SQL Commands

• 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, and set permission for users.

Types of SQL Commands

• There are five types of SQL commands: DDL, DML, DCL, TCL, and DQL.



Data Definition Language (DDL)

• 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 Definition Language (DDL) – **CREATE**

CREATE It is used to create a new table in the database.
Syntax:

```
CREATE TABLE TABLE_NAME (
COLUMN_NAMEs  DATATYPES ,
…….
);
```

Example:

```
CREATE TABLE EMPLOYEE (
Name VARCHAR(20),
Email VARCHAR(100),
DOB DATE
);
```

Data Definition Language (DDL) – Drop

Drop: It is used to delete both the structure and record stored in the table.

Syntax:
DROP TABLE Table_name ;
Example:
DROP TABLE EMPLOYEE;

Data Definition Language (DDL) – ALTER

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.

Syntax:
ALTER TABLE table_name
ADD column_name COLUMN-Type;

ALTER TABLE
MODIFY (COLUMN new Data type....);
Example:
ALTER TABLE STU_DETAILS
ADD (ADDRESS VARCHAR(20));

ALTER TABLE STU_DETAILS
MODIFY (NAME VARCHAR(20));

Data Definition Language (DDL)-TRUNCATE

TRUNCATE: It is used to delete all the rows from the table and free the space containing the table.

Syntax:
TRUNCATE TABLE table_name;
Example:
TRUNCATE TABLE EMPLOYEE;

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 Manipulation Language – INSERT

INSERT: The INSERT statement is a SQL query. It is used to insert data into the row of a table.

Syntax:
INSERT INTO TABLE_NAME (col1, col2, col3,.... col N)
VALUES (value1, value2, value3, ...);
OR
INSERT INTO TABLE_NAME VALUES (value1, value2, value3, ...);

Example:
INSERT INTO XYZ (Author, Subject) VALUES ("Sonoo", "DBMS");

Data Manipulation Language - UPDATE

Update: This command is used to **update or modify** the value of a column in the table.

Syntax:
UPDATE table_name
SET [column_name1= value1,...column_nameN = valueN]
[WHERE CONDITION]
Example:
UPDATE students
SET User_Name = 'Sonoo'
WHERE Student_Id = '3'

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

Data Control Language – **Grant**

GRANT: It is used to give user access privileges to a database.
Example:
GRANT SELECT, UPDATE ON MY_TABLE TO SOME_USER, ANOT
HER_USER;

REVOKE: It is used to take back permissions from the user.
Example:
REVOKE SELECT, UPDATE ON MY_TABLE FROM USER1, USER2;

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

Transaction Control Language - COMMIT

Commit: Commit command is used to save all the transactions to the database.

Syntax:

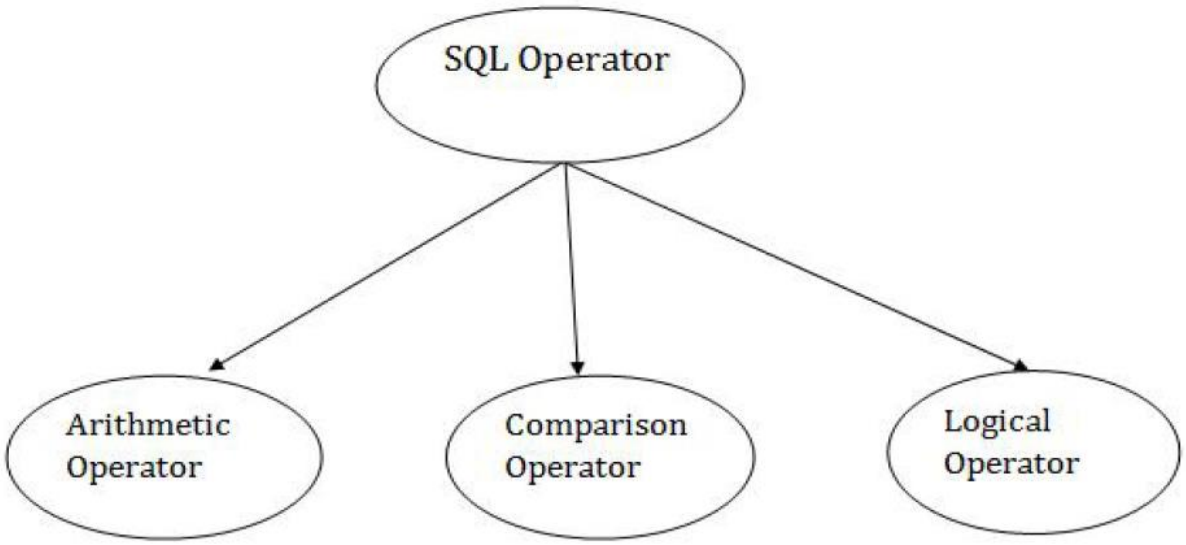
```
COMMIT;
```

Example:

```
DELETE FROM CUSTOMERS
WHERE AGE = 25;
COMMIT;
```

SQL Operator

There are various types of SQL operator:



SQL Comparison Operators:

Operator	Description
+	It adds the value of both operands.
-	It is used to subtract the right-hand operand from the left-hand operand.
*	It is used to multiply the value of both operands.
/	It is used to divide the left-hand operand by the right-hand operand.
%	It is used to divide the left-hand operand by the right-hand operand and returns reminder.

SQL Arithmetic Operators

Operator	Description
=	It checks if two operands values are equal or not, if the values are queal then condition becomes true.
!=	It checks if two operands values are equal or not, if values are not equal, then condition becomes true.
<>	It checks if two operands values are equal or not, if values are not equal then condition becomes true.
>	It checks if the left operand value is greater than right operand value, if yes then condition becomes true.
<	It checks if the left operand value is less than right operand value, if yes then condition becomes true.
>=	It checks if the left operand value is greater than or equal to the right operand value, if yes then condition becomes true.

Operator	Description
All	It compares a value to all values in another value set.
AND	It allows the existence of multiple conditions in an SQL statement.
ANY	It compares the values in the list according to the condition.
Between	It is used to search for values that are within a set of values.
IN	It compares a value to that specified list value.
NOT	It reverses the meaning of any logical operator.
OR	It combines multiple conditions in SQL statements.
EXIST	It is used to search for the presence of a row in a specified table.
LIKE	It compares a value to similar values using wildcard operator.