

SQL Essentials

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- First thing is first: What is SQL?

- In simple words : SQL is the analyst's language of choice for handling structured data,
- structured query language (SQL) remains the standard means for analysts to communicate with relational databases and their **columnar**, cloud-based counterparts: data warehouses.,
- SQL lets you access and manipulate databases

- What Can SQL do?

- SQL can execute queries against a database
- SQL can retrieve data from a database
- SQL can insert records in a database
- SQL can update records in a database
- SQL can delete records from a database
- SQL can create new databases
- SQL can create new tables in a database
- SQL can create stored procedures in a database
- SQL can create views in a database
- SQL can set permissions on tables, procedures, and views

- Is SQL a Standard language?

- SQL is an ANSI/ISO standard, there are different versions of the SQL language.
- However, to be compliant with the ANSI standard, they all support at least the major commands (such as SELECT, UPDATE, DELETE, INSERT, WHERE) in a similar manner.
- But Most of the SQL database programs also have their own proprietary extensions in addition to the SQL standard!

- What I need to use SQL in my website?

- An RDBMS database program (i.e. PostgreSQL, Microsoft SQL Server, MySQL)
- a server-side scripting language, like PHP ,ASP or JavaScript.
- SQL to get the data you want.
- HTML / CSS to style the page.

- What is RDBMS?

- RDBMS stands for Relational Database Management System.

- RDBMS is the basis for SQL, and for all modern database systems such as MS SQL Server, IBM DB2, Oracle, MySQL, PostgreSQL, and Microsoft Access.
- The data in RDBMS is stored in database objects called tables. A table is a collection of related data entries and it consists of columns and rows.

- DataBase table

- A database most often contains one or more tables. Each table is identified by a name (e.g. "Customers" or "Orders"). Tables contain records (rows) with data.

- Why Semicolon after SQL Statements?

- Some database systems require a semicolon at the end of each SQL statement.
- Semicolon is the standard way to separate each SQL statement in database systems that allow more than one SQL statement to be executed in the same call to the server.

- Finally the most important SQL Commands

- "SELECT" - extracts data from a database
- "UPDATE" - updates data in a database
- "DELETE" - deletes data from a database
- "INSERT INTO" - inserts new data into a database
- "CREATE DATABASE" - creates a new database
- "ALTER DATABASE" - modifies a database
- "CREATE TABLE" - creates a new table
- "ALTER TABLE" - modifies a table
- "DROP TABLE" - deletes a table
- "CREATE INDEX" - creates an index (search key)
- "DROP INDEX" - deletes an index

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Why Learn SQL?

SQL is Structured Query Language, which is a computer language for storing, manipulating and retrieving data stored in a relational database.

SQL is the standard language for Relational Database System. All the Relational Database Management Systems (RDMS) like MySQL, MS Access, Oracle, Sybase, Informix, Postgres and SQL Server use SQL as their standard database language.

A Brief History of SQL

- 1970 – Dr. Edgar F. "Ted" Codd of IBM is known as the father of relational databases. He described a relational model for databases.
- 1974 – Structured Query Language appeared.
- 1978 – IBM worked to develop Codd's ideas and released a product named System/R.
- 1986 – IBM developed the first prototype of a relational database and standardized by ANSI. The first relational database was released by Relational Software which later came to be known as Oracle.

Applications of SQL

As mentioned before, SQL is one of the most widely used query languages over databases. I'm going to list few of them here:

- Allows users to access data in the relational database management systems.
- Allows users to describe the data.
- Allows users to define the data in a database and manipulate that data.
- Allows embedding within other languages using SQL modules, libraries & pre-compilers.
- Allows users to create and drop databases and tables.
- Allows users to create views, stored procedures, functions in a database.
- Allows users to set permissions on tables, procedures and views.

Advantages of SQL

SQL provides various advantages which make it more popular in the field of data science. It is a perfect query language which allows data professionals and users to communicate with the database. Following are the best advantages or benefits of Structured Query Language:

1. No programming needed

SQL does not require a large number of coding lines for managing the database systems. We can easily access and maintain the database by using simple SQL syntactical rules. These simple rules make the SQL user-friendly.

2. High-Speed Query Processing

A large amount of data is accessed quickly and efficiently from the database by using SQL queries. Insertion, deletion, and updation operations on data are also performed in less time.

3. Standardized Language

SQL follows the long-established standards of ISO and ANSI, which offer a uniform platform across the globe to all its users.

4. Portability

The structured query language can be easily used in desktop computers, laptops, tablets, and even smartphones. It can also be used with other applications according to the user's requirements.

5. Interactive language

We can easily learn and understand the SQL language. We can also use this language for communicating with the database because it is a simple query language. This language is also used for receiving the answers to complex queries in a few seconds.

6. More than one Data View

The SQL language also helps in making the multiple views of the database structure for the different database users.

Disadvantages of SQL

With the advantages of SQL, it also has some disadvantages, which are as follows:

1. Cost

The operation cost of some SQL versions is high. That's why some programmers cannot use the Structured Query Language.

2. Interface is Complex

Another big disadvantage is that the interface of Structured query language is difficult, which makes it difficult for SQL users to use and manage it.

3. Partial Database control

The business rules are hidden. So, the data professionals and users who are using this query language cannot have full database control.