

What is SQL?

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Structured Query Language (SQL) is a powerful, non-procedural, database language that is used to create, maintain and retrieve the relational database (a type of database that provides and stores data that are related to each other). Developed by IBM in the 1970s, it enables end-users to interact with several database management systems as per availability.

SQL offers a larger degree of abstraction than procedural (code that is written as a sequence of instructions) languages and is quite user-friendly. SQL is very popular among programmers and is used by more than 50 percent of programmers. Some features of SQL are:

It is a Data Manipulation Language (DML) – It is used to modify data.

It is Data Definition Language (DDL) – It contains instructions that will determine the data.

It provides Client Service Execution and also helps in remote access of databases.

It provides security and authentication features.

It can be used to commit, roll back and save all our changes.

There are six types of commands in SQL. They are as

follows:

Data Manipulation Language
(DML)

Data Definition Language
(DDL)

Data Control Language (DCL)

Transaction Control Language
(TCL)

Data Query Language (DQL)

Advantages of SQL

SQL has numerous advantages which makes it a highly popular and reliable language to use.

Some of them are as follows:

Coding skills are not needed – It is quite easy to manage the database without the need to write a large number of lines of code.

High query processing speed – A huge chunk of data can be retrieved quickly and with high accuracy. Operations such as insertion, deletion, manipulation of data also do not take much time.

The standards are well defined – SQL has been accepted by ANSI and ISO/IEC as the standard language for a relational database. It also provides great documentation and a uniform platform worldwide to all its users. The community of SQL is so active that people and businesses get inclined towards technology.

Portable – SQL can be used to program in PCs, servers, laptops, and some mobile

phones independent of any platform.

User-friendly – SQL is easy to learn and understand. It is a go-to relational language for beginners.

Interactive Language – Easy to learn and understand, answers to complex queries can be received in seconds.

Multiple data views – SQL can be used to make different views of the database structure. This means that it enables users to create virtual tables which also has rows and column – which in turn helps the users to analyze and slice the data in multiple ways to formulate different perspectives of the data.

Disadvantages of SQL

The disadvantages of SQL are given below:

Complex interface – The interface offered by SQL is complex which sometimes makes it difficult for users to access.

Partial Control – SQL programmers don't have complete control over the database because of the hidden business rules.

Operating Cost – The operating cost of some SQL versions is quite high which makes it difficult for some programmers to access it.

Implementational Challenge –
There are some databases

available in markets that have SQL as a parent database. Hence, there is a vendor lock-in that needs to be addressed.

Tables Dependency – When we create a view based on underlying tables of a database and change the structure of those tables. In such a case we will have to change the view as well. This makes the task more complex.

What is PL SQL?

PL/SQL is a procedural (code that is written as a sequence of instructions) language that enables programmers to combine the power of SQL with procedural statements. PL/SQL stands for Procedural Language extensions to SQL. In PL/SQL, all the statements are executed at once which consists of triggers, functions, procedures, etc, that enhance the functionality of an operation and decrease the traffic. Developed by Oracle Corporation in the 1990s, it was designed to build server pages and web applications and exhibits features such as abstraction and error handling.

The structure of a PL/SQL block consists of four parts: Declare, Begin, Exception and End. It is illustrated in the figure below.

PL SQL Block

PL SQL Block

Features of PL SQL

Some features of PL/SQL are:

PL/SQL is tightly integrated with

SQL. It possesses all capabilities of SQL.

It helps in checking the error very precisely.

There are a lot of different data types and data structures which are provided by PL/SQL.

Structured programming is supported by the usage of functions and procedures. It has added support for OOPs (Object Oriented Programming)

Development of Server Pages and Web Applications can also be achieved.

Advantages of PL SQL

There are numerous advantages of using PL/SQL. Some of them are mentioned below:

Block Structures – Each PL/SQL block of code forms a unit of task and can be reused.

Better performance – PL/SQL executes all statements in bulk rather than a single statement which increases the processing speed.

Posses capabilities of procedural language – Conditional (if-else statements) and Iterative (loops such as for, while do-while) constructs are offered by PL/SQL.

Supports error handling – Error and exceptions are handled by PL/SQL with high accuracy.

Disadvantages of PL SQL

The disadvantages of PL/SQL are mentioned below:

Limited I/O features – PL/SQL

provides very limited support for I/O either to read/write files or to read from or write to a user interface.

Complex syntax – Sometimes, PL/SQL is not very easy for programmers to follow due to its complex and inconsistent syntax.

Proprietary to Oracle – It means that if one has to change the database vendors then the user would have to update all the existing Oracle PL/SQL code. It is a bit expensive.

Not beginner-friendly – Certain concepts in PL/SQL can become difficult for beginners to understand

Key Differences

There are many differences between SQL and PL/SQL. SQL is a non-procedural language that executes a single query at a time whereas, PL/SQL is a procedural language and executes blocks of code at once which helps reduce traffic and increases processing speed. PL/SQL provides supports features such as variables, conditional (if-else statements), and iterative (loops such as for, while) constructs. SQL does not provide support for these features. PL/SQL also offers error and exception handling features that do not exist in SQL. PL/SQL is used to write a programming block that has procedures, functions, triggers, packages, variables within its syntax. On the other hand, SQL

queries and commands are written using DDL (Data Definition Language), DML (Data Manipulation Language).

Conclusion

PL/SQL is SQL combined with some added procedural features and it performs all the things that SQL performs but on large volumes of data using procedures, functions, control structures, cursors, and triggers. SQL tells us what data is needed but does not specify how it can be retrieved. This is where PL/SQL comes into the picture. The advent of PL/SQL has enabled us to deal with complex SQL problems with ease which earlier were a pain in the neck. In this era, data is the new oil and managing data has been of prime importance, unlike any other time. This makes the use of PL/SQL integral for the functioning of many organizations. Knowledge of SQL and PL/SQL can prove quite handy.