

What is SQL?

Answer:-

SQL is a standard language for accessing and manipulating databases.

SQL stands for Structured Query Language

SQL lets you access and manipulate databases

SQL became a standard of the American National Standards Institute (ANSI) in 1986, and of the International Organization for Standardization (ISO) in 1987

SQL, short for Structured Query Language, is a programming language that is used to manage data in relational databases. Relational databases use relations (typically called tables) to store data and then match that data by using common characteristics within the dataset.

What is NoSQL?

Answer:-

A NoSQL database, on the other hand, is self-describing, so does not require a schema. Nor does it enforce relations between tables in all cases. All its documents are JSON documents, which are complete entities that one can readily read and understand.

NoSQL databases (aka "not only SQL") are non-tabular databases and store data differently than relational tables. NoSQL databases come in a variety of types based on their data model. The main types are document, key-value, wide-column, and graph. They provide flexible schemas and scale easily with large amounts of data and high user loads.

KEY DIFFERENCE BETWEEN SQL AND NoSQL

SQL databases

1 : SQL databases use Structured Query Language for defining and manipulating data. This allows SQL to be extremely versatile and widely-used—it also makes it more restrictive.

2 : In SQL, you use predefined schemas to determine the structure of your data before you begin to work with it.

3 : In SQL, your data also follow the same structure, which can entail significant upfront preparation along with careful execution.

NoSQL databases

1: A NoSQL database features a dynamic schema for unstructured data and the data can be stored in many different ways, whether it be graph-based, document-oriented, column-oriented, or organized as a Key/Value store.

2 : 2.1) NoSQL, create documents without first having to carefully plan and define their structure

3 : In NoSQL, it varies the syntax from database to database and gives each document its own unique structure, providing

	you with more freedom overall
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Advantages of SQL :

SQL has many advantages which makes it popular and highly demanded. It is a reliable and efficient language used for communicating with the database. Some advantages of SQL are as follows:

1 : Faster Query Processing –

Large amount of data is retrieved quickly and efficiently. Operations like Insertion, deletion, manipulation of data is also done in almost no time.

2 : No Coding Skills –

For data retrieval, large number of lines of code is not required. All basic keywords such as SELECT, INSERT INTO, UPDATE, etc are used and also the syntactical rules are not complex in SQL, which makes it a user-friendly language.

3 : Standardized Language –

Due to documentation and long establishment over years, it provides a uniform platform worldwide to all its users.

4 : Portable –

It can be used in programs in PCs, server, laptops independent of any platform (Operating System, etc). Also, it can be embedded with other applications as per need/requirement/use.

5 : Interactive Language –

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

6 : Multiple data views –

Disadvantages of SQL :

Although SQL has many advantages, still there are a few disadvantages. Various Disadvantages of SQL are as follows:

1: Complex Interface –

SQL has a difficult interface that makes few users uncomfortable while dealing with the database.

2 : Cost –

Some versions are costly and hence, programmers cannot access it.

3 : Partial Control –

Due to hidden business rules, complete control is not given to the database.

Advantages of NoSQL:

There are many advantages of working with NoSQL databases such as MongoDB and Cassandra. The main advantages are high scalability and high availability.

1 : High scalability –

NoSQL databases use sharding for horizontal scaling. Partitioning of data and placing it on multiple machines in such a way that the order of the data is preserved is sharding. Vertical scaling means adding more resources to the existing machine whereas horizontal scaling means adding more machines to handle the data. Vertical scaling is not that easy to implement but horizontal scaling is easy to implement. Examples of horizontal scaling databases are MongoDB, Cassandra, etc. NoSQL can handle a huge amount of data because of scalability, as the data grows NoSQL scale itself to handle that data in an efficient manner.

2 : High availability –

Auto replication feature in NoSQL databases makes it highly available because in case of any failure data replicates itself to the previous consistent state.

Disadvantages of NoSQL:

NoSQL has the following disadvantages.

1 : Narrow focus –

NoSQL databases have a very narrow focus as it is mainly designed for storage but it provides very little functionality. Relational databases are a better choice in the field of Transaction Management than NoSQL.

2 : Open-source –

NoSQL is open-source database. There is no reliable standard for NoSQL yet. In other words, two database systems are likely to be unequal.

3 : Management challenge –

The purpose of big data tools is to make the management of a large amount of data as simple as possible. But it is not so easy. Data management in NoSQL is much more complex than in a relational database. NoSQL, in particular, has a reputation for being challenging to install and even more hectic to manage on a daily basis.

4: GUI is not available –

GUI mode tools to access the database are not flexibly available in the market.

5: Backup –

Backup is a great weak point for some NoSQL databases like MongoDB. MongoDB has no approach for the backup of data in a consistent manner.

6 : Large document size –

Some database systems like MongoDB and CouchDB store data in JSON format. This means that documents are quite large (BigData, network bandwidth, speed), and having descriptive key names actually hurts since they increase the document size.

Real life applications

FOR NoSQL

MONGODB:-

MongoDB records are called documents. Each MongoDB database (You can have many.) includes collections, which are a set of JSON documents. Each collection and document has an ObjectID created by MongoDB or supplied by the programmer

MarkLogic: MarkLogic is a multi-model NoSQL database that has evolved from its XML database roots to also natively store JSON documents and RDF triples for its semantic data model. It uses a distributed architecture that can handle hundreds of billions of documents and hundreds of terabytes of data.

Another example is analytics.

Lets say you want to build the next Google Analytics. You figure out you want to track IP Address, Browser & Device type. Later you, however, finds out you might want to track Browser Size as well. Since analytics databases can contain millions/billions of data, it isn't so easy to add an extra column to your table. It would simply take too long.

With a NOSQL solution you might just add it to the future rows, without having to change every row in the tracking table.

So in general "every" place where you need to crunch data and numbers for reports.

FOR SQL

Microsoft Microsoft SQL Server Management Studio (SSMS):-

SQL Server Management Studio (SSMS) is an integrated environment for managing any SQL infrastructure. Use SSMS to access, configure, manage, administer, and develop all components of SQL Server, Azure SQL Database , Azure SQL Managed Instance, SQL Server on Azure VM, and Azure Synapse Analytics.

Applications of SQL :

SQL is used by developers and DBAs (Database Administrators) in writing Data Integration Scripts.

It is used to deal with analytical queries to analyze the data and get instincts from it.

Retrieving Information

Modification/Manipulation of data and database table such as Insertion, Deletion and Updation.