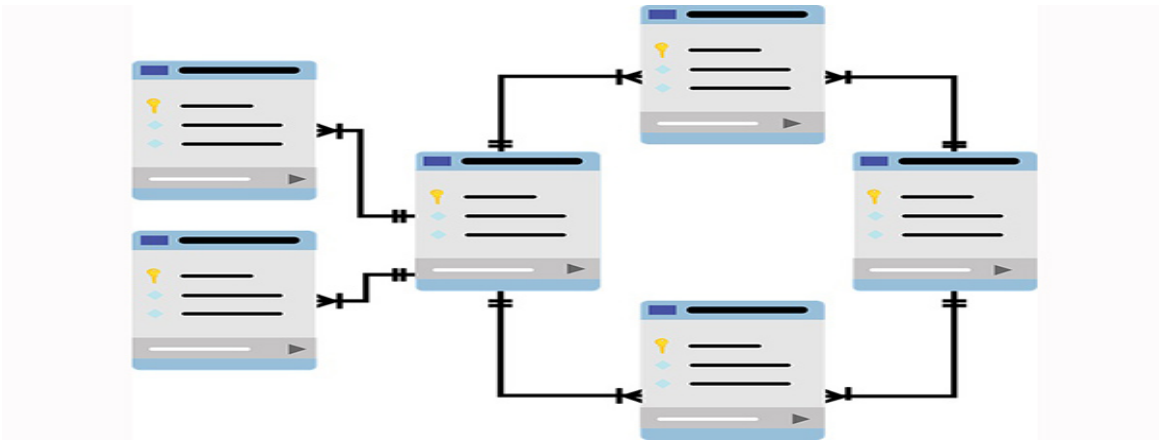
SQL vs NoSQL DATABASE

This article is about the SQL & NoSQL database, their differences and examples. First of all, **“What is a database?”** In simple words, a database is a place where data is stored. It is an collection of data that is organized so that it can be easily accessed, managed and updated. Without proper database it is impossible to manage the amount of data that is present in this current technical world. Some examples for database are Oracle, MySQL, MongoDB, MariaDB etc., Now, let’s see about the SQL & NoSQL databases.

What is SQL?



SQL stands for **Structured Query Language**. It is a standard language for storing, manipulating and retrieving data in databases. It is the core of relational database and is used for accessing and managing database. This language helps to handle the data from the database whose structure is made of tables with rows and columns and the tables are interlinked with each other with specific values. With the help of queries such as insert, update, delete and select , the data can be easily retrieved or manipulated. For example,

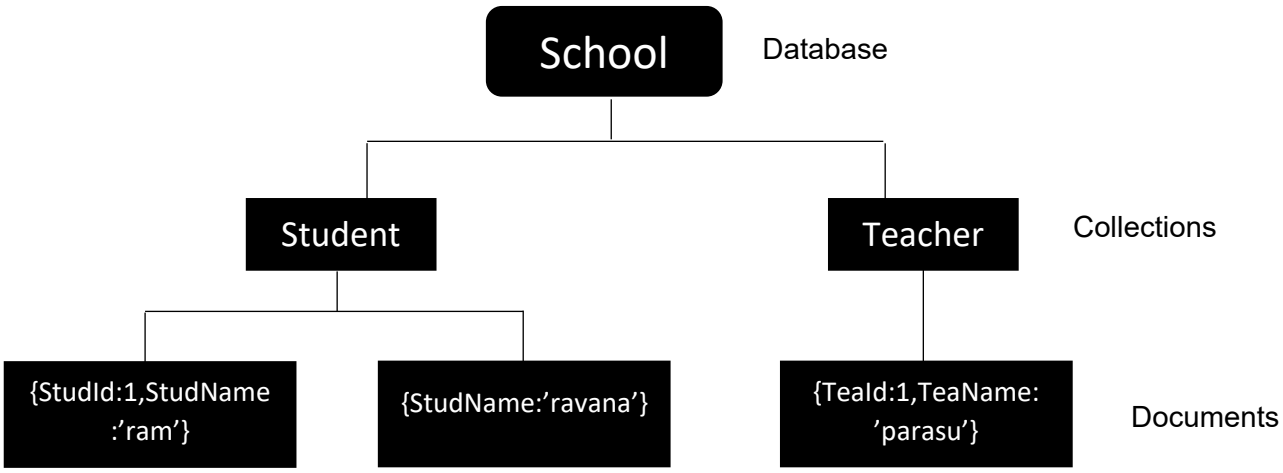
SELECT RegNo, StudName FROM Student;

In the above example the query is used to retrieve the registration number and name of the student from the student table. In that query, SELECT & FROM are SQL keywords and RegNO, StudName & Student are the parameter that indicate what data has to be retrieved from which table.

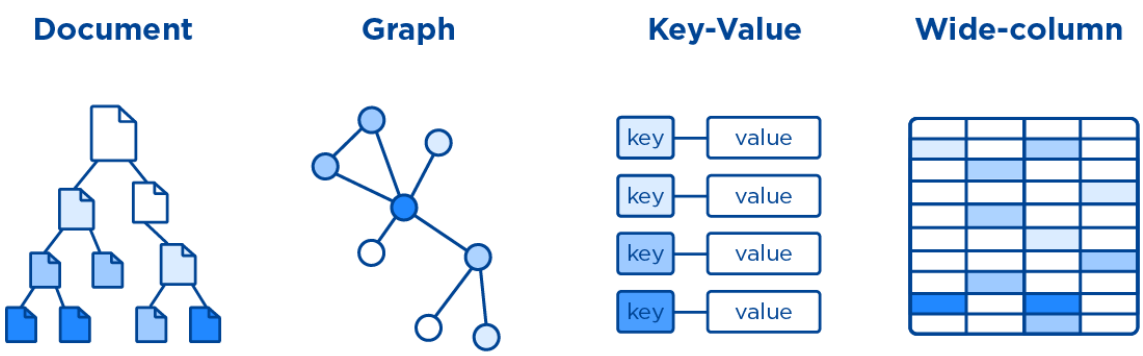
SQL also help to maintain the relationship between the tables in the database. The relationship could be either one-one, one-many, many-many and self-referencing relationships.

What is NoSQL?

NoSQL, known as “non-SQL” or “Not only SQL” database. It provides a mechanism for storing and retrieval of data and it is the next generation database. It has no specific schema like SQL DB of tables with rows and columns storing data but it can handle huge amount of data. In NoSQL database the term Documents is considered to be data value and the term Collections is considered to be like table.



NoSQL databases need not have to use a same schema for the presence of multiple documents in one collection.NoSQL has dynamic schema that means multiple documents can be present in a single collection and also each collection can have different documents.In the above example, the school is the database and Student & Teacher are collections.In the Student collection, it is cleared that Documents are different, one have id and name but another one have only name.Thus it supports dynamic schema.Since no specific query language present in NoSQL, so the retrieval of data is completely based on basically how and where the data is stored.And moreover NoSQL have no or few relationships between the data.



Difference Between SQL and NoSQL Database

*	SQL Database	NoSQL Database
Type of database	Relational database	Non – Relational database
Schema	Pre-defined schema	Dynamic Schema
Database Categories	Table based databases	• Document databases • Key-value databases • Wide-column stores • Graph database
Complex queries	Good for complex queries	Not a good fit for complex queries
Hierarchical Data Storage	It uses tables to store data. So it is not good fit for hierarchical data storage.	It fits better compared to SQL because it uses key-value pair way for storing data.
Scalability	SQL is vertically scalable and the load balancing can be done by increasing the CPU, RAM and SSD on single server.	NoSQL is horizontally Scalable and the load balancing can be done by adding more servers into the cluster of servers.
Language	It has a specific language that doesn't vary from db to db. It is Structured Query Language	It has no specific language. It varies from a db to db
Online Processing	Mainly used for Online Transaction Processing	Mainly used for Online Analytical Processing
Base Properties	Atomicity, Consistency, Isolation, Durability	Consistency, Availability, Partition Tolerance
External Support	Excellent Support is provided by all SQL vendors	Only Limited experts available and have to rely on community support
Examples	Oracle, PostgreSQL, MySQL, Microsoft SQL Server, SQLite	redis, mongoDB, Cassandra, Apache HBase

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