SQL vs NoSQL: A Comparative Overview

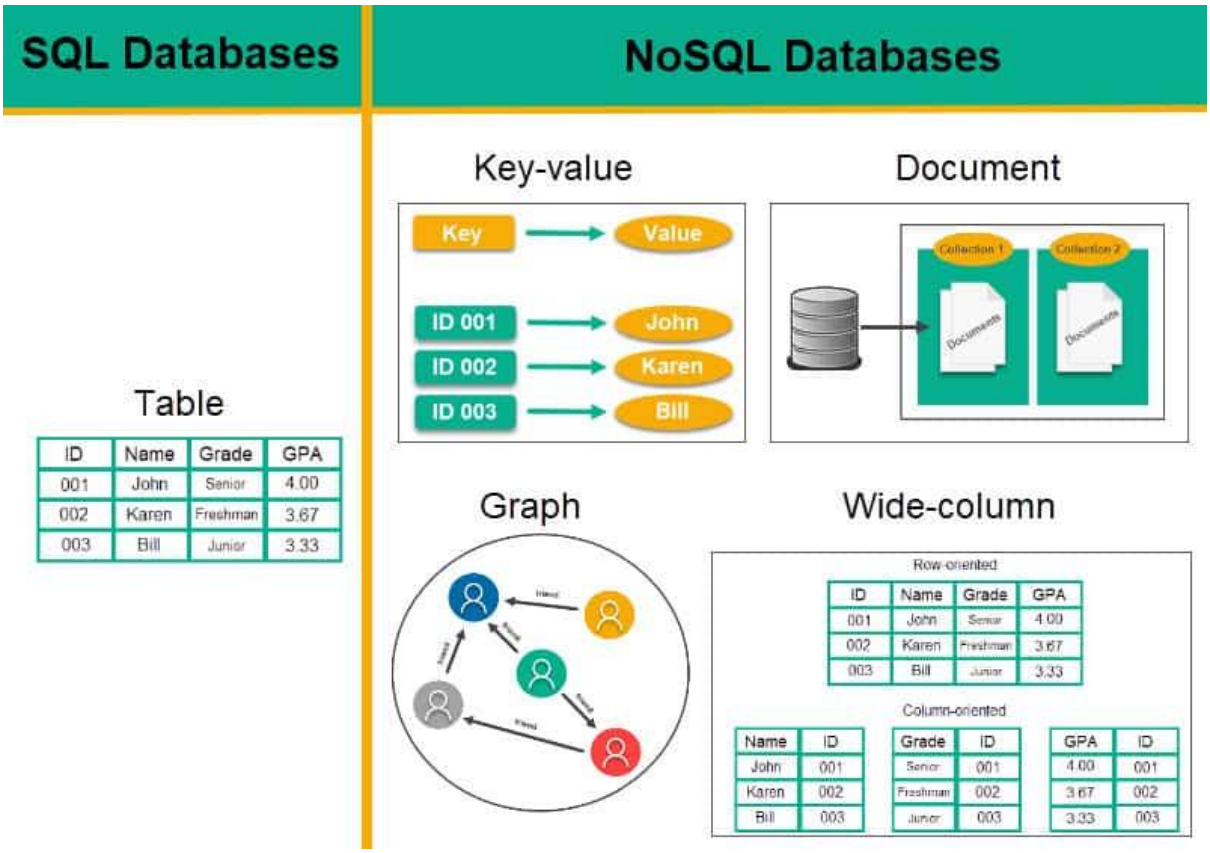
1. What is SQL and What is NoSQL?

SQL (Structured Query Language):

- A language used to manage and query relational databases.
- Data is stored in tables with predefined schemas (rows and columns).
- Examples: MySQL, PostgreSQL, Oracle, Microsoft SQL Server.

NoSQL (Not Only SQL):

- A category of databases designed to handle unstructured or semi-structured data.
- Data is stored in formats like key-value pairs, documents, graphs, or wide-columns.
- Examples: MongoDB (document), Redis (key-value), Cassandra (wide-column), Neo4j (graph).



2. When to Choose SQL vs NoSQL

Choose SQL when:

- Your data is structured and relational.
- You need strong consistency and ACID compliance.
- Complex queries and joins are required.
- Schema is stable and well-defined.
- Vertical scaling is sufficient.

Choose NoSQL when:

- Your data is unstructured or semi-structured.
- You need flexible schema and rapid development.
- High scalability and performance are critical.
- Real-time analytics or caching is needed.
- Horizontal scaling is preferred.

3. Advantages of SQL and NOSQL

SQL Advantages:

- Strong consistency and reliability (ACID properties).
- Mature ecosystem with robust tools and support.
- Powerful query capabilities with JOINs and aggregations.
- Ideal for structured data and complex relationships.

NoSQL Advantages:

- High scalability and performance for large datasets.
- Flexible schema design for agile development.
- Better suited for big data, IoT, and real-time applications.
- Variety of models to match specific use cases (document, key-value, graph, etc.).