# Comparison Between MongoDB and SQL

## Introduction to SQL and MongoDB

SQL (Structured Query Language):

- Relational Database Management System (RDBMS).
- Uses structured tables with rows and columns.
- Common SQL databases: MySQL, PostgreSQL, Oracle, SQL Server.

MongoDB (NoSQL Database):

- NoSQL document-oriented database.
- Stores data in JSON-like BSON format.
- Ideal for handling unstructured or semi-structured data.

## Structural Differences

SQL:

- Tables with rows and columns.
- Fixed schema with defined fields.
- Strongly enforced relationships with foreign keys.
- Vertical scalability.

MongoDB:

- JSON/BSON document storage.
- Dynamic schema with flexible fields.
- Flexible, non-relational model.
- Horizontal scalability.

## Performance & Scalability Comparison

SQL:

- Optimized for structured data.
- Uses SQL queries (SELECT, JOIN, etc.).
- Strong ACID compliance.
- Scales vertically.

MongoDB:
- Optimized for large-scale unstructured data.
- Uses Mongo Query Language (MQL).
- BASE (Eventually Consistent).
- Scales horizontally.

## When to Use Each?

Use SQL when:
- You need structured, relational data.
- Transactions require strict consistency (e.g., Banking).
- You need complex queries with JOINs.

Use MongoDB when:
- You need a flexible schema for dynamic data.
- Handling large-scale unstructured data (Big Data, IoT, Social Media).
- High-speed read and write operations.

Conclusion:
- SQL is ideal for structured, relational data.
- MongoDB is better suited for flexible, high-speed applications.
- Choose based on your project requirements.