Introduction to Mongodb

MongoDB is an open-source, NoSQL, document-oriented database developed by MongoDB Inc.

It Stores Structured and Unstructured Data,but popular to store Unstructured Data

Mongodb Stores data as documents in a format similar to JSON (called BSON — Binary JSON) instead of Storing data in Tables and Row Columns

It's great for applications that need to handle large volumes of unstructured or semi-structured data.

🧾 Why Mongodb?

📦 Flexible Schema

You don’t need to predefine your schema (structure of your data). Documents in the same collection can have different fields.

⚡ Fast for Large-Scale Data

MongoDB is designed to handle high volumes of unstructured or semi-structured data efficiently.

🌐 Great with JavaScript/Node.js

Since data is stored as JSON-like documents (BSON), it's a natural fit for JavaScript-based applications.

☁️ Works Well in Cloud Environments

MongoDB integrates seamlessly with cloud platforms like **MongoDB Atlas**, making deployment and scaling easier.

🔄 Easily Scalable (Horizontally)

Supports **sharding** (horizontal scaling), which distributes data across multiple servers for better performance and capacity.

🧾 When to use Mongodb?

📈 You Need Scalability and Performance

MongoDB handles large volumes of data efficiently and supports horizontal scaling for growing applications.

🧬 Your Data Structure is Dynamic or Changing

MongoDB's flexible schema allows you to evolve your data model without downtime or migrations.

🛠️ You're Building Apps with JavaScript-Based Stacks

Perfect for stacks like **MERN** (MongoDB, Express, React, Node) because MongoDB stores data in a JSON-like format (BSON).

🔗 You Want to Avoid Complex Joins and Prefer Nested Documents

MongoDB supports **embedded/nested documents**, making it easier to model relationships without complex JOINs.

🧾 What is NoSQL?

NoSQL stands for **"Not Only SQL"** — it's a broad category of databases that differ from traditional **relational databases (RDBMS)**.

Instead of storing data in tables with rows and columns, **NoSQL databases** use various data models like:

- 📄 **Document-based** (e.g., MongoDB)
- 📦 **Key-Value stores** (e.g., Redis)
- 🧮 **Column-based** (e.g., Cassandra)
- 🔗 **Graph-based** (e.g., Neo4j)

🏗️ Why NoSQL?

📦 Flexible Data Models

NoSQL allows you to store data in various formats: **documents, key-value pairs, graphs, or wide-columns**.

⚡ High Performance at Scale

Optimized for **read/write speed** even with massive datasets and Ideal for **real-time applications**, like chat apps, gaming, and analytics dashboards.

🧠 Great for Semi-Structured & Unstructured Data

Handles data from **IoT devices**, **logs**, **social media**, **user behavior**, etc., without needing to transform it into a strict table format.

🌐 Perfect for Modern Web & Mobile Apps

JSON-like data formats (like BSON in MongoDB) work seamlessly with JavaScript and REST APIs.

✅ Advantages of MongoDB

- **Schema-less**
- **Scalability**
- **High Performance**
- **Data Flexibility**
- **Developer-Friendly**
- **Ease of Use**
- **Cloud-Native Compatibility**