**MongoDB Takeaways - JULY -18/07/2025**

**What is NoSQL?**

NoSQL stands for “Not Only SQL.” It is a type of database that allows storage and retrieval of unstructured or semi-structured data without relying on a traditional table-based (relational) model.

Key Features of NoSQL:

* Does not require a fixed schema
* Handles large volumes of data
* Horizontal scalability (adding more servers easily)
* Works with documents, key-value pairs, graphs, or columns

**Why NoSQL?**

Traditional SQL databases (like MySQL, PostgreSQL) are great for structured data, but real-world applications today often deal with:

* JSON / nested data
* Variable fields
* Frequent schema changes

Example:

|  |
| --- |
| {  "name": "Shruthi",  "course": "Data Engineering",  "completed": true  } |

**What is MongoDB?**

MongoDB is a popular document-based NoSQL database that stores data in JSON-like documents called BSON (Binary JSON).

**Key Concepts:**

* Document → Like a row in SQL but flexible
* Collection → Like a table, but stores documents
* Database → Group of collections

**MongoDB Features:**

* Schema-less documents
* Powerful query language
* Indexing and Aggregation
* Horizontal scalability
* Easy integration with modern apps

Example Document:

|  |
| --- |
| {  "student\_id": 101,  "name": "Anjali",  "courses": ["MongoDB", "Python"],  "marks": {  "MongoDB": 89,  "Python": 93}  } |

**Why MongoDB is Not RDBMS?**

|  |  |
| --- | --- |
| MongoDB | RDBMS |
| * No fixed schema * Stores JSON-like documents * Scales horizontally * Easier with large datasets | * Requires predefined schema * Stores rows and tables * Harder to scale * Can be slower with big data |

Key Differences:

* MongoDB does not use SQL; it uses its own query syntax.
* Relational DBs are ideal for transactions and relationships, while MongoDB is better for flexible and fast data storage.

**Advantages of NoSQL + Use Cases**

Advantages:

* Flexible schema → store different structures
* Faster for reading/writing big unstructured data
* Cloud-native and scalable
* Better for IoT, real-time apps, chat systems

**Real-world Use Cases:**

* E-commerce (product catalogs)
* Social media platforms (comments, likes)
* IoT device data
* Chatbot conversations
* Healthcare records

**Tools Often Used**:

* MongoDB Compass – GUI to manage MongoDB data
* Mongoose – Node.js ODM library for MongoDB
* Mongo Shell – CLI to interact with the DB

**Overview:**

**MongoDB** is a popular NoSQL database that stores data in flexible, JSON-like documents.  
Unlike traditional SQL databases, it supports unstructured and semi-structured data.  
It offers horizontal scalability, high performance, and easy integration with modern apps.  
MongoDB is ideal for real-time analytics, big data, and dynamic content applications.