

MongoDB

Chapter 1: Introduction to NoSQL and MongoDB

- Introduction to NoSQL databases and their advantages.
- Overview of MongoDB as a document-oriented database.
- Installation and setup of MongoDB.

Chapter 2: MongoDB Data Model

- Understanding BSON (Binary JSON) format.
- Working with collections and documents.
- Data types in MongoDB documents.

Chapter 3: CRUD Operations

- Creating documents using INSERT.
- Retrieving documents using FIND.
- Updating documents using UPDATE.
- Deleting documents using REMOVE.

Chapter 4: Querying and Filtering Data

- Using query operators for advanced data retrieval.
- Aggregation framework for complex queries.
- Indexing and optimization.

Chapter 5: Data Modeling and Schema Design

- Design considerations for NoSQL databases.
- Schema design best practices.
- Embedding vs. referencing documents.

Chapter 6: Working with the MongoDB Shell

- Command-line interface for MongoDB.
- Executing CRUD operations through the shell.
- Scripting with JavaScript in the shell.

Chapter 7: Building Applications with MongoDB

- Integrating MongoDB with programming languages (e.g., Node.js, Python).
- Developing a basic web application with MongoDB as the backend database.
- Error handling and debugging.

Chapter 8: Scaling and Replication

- Introduction to MongoDB scaling strategies.
- Replication and high availability with MongoDB.
- Sharding and distributed databases.

Chapter 9: Security and Authentication

- Setting up user authentication.
- Role-based access control (RBAC) in MongoDB.
- Best practices for securing MongoDB databases.

Chapter 10: Case Studies and Real-World Applications

- Exploring real-world applications and use cases of MongoDB.

- Hands-on projects and assignments.

Chapter 11: Advanced Topics and Trends

- Exploring advanced MongoDB features (e.g., geospatial indexing, text search).
- Trends and developments in the NoSQL and MongoDB ecosystem.

Chapter 12: Final Project and Course Conclusion

- Developing a final project using MongoDB.
- Presentation and discussion of projects.
- Course review and next steps in MongoDB and NoSQL database development.