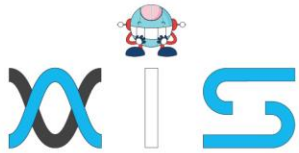


# MONGODB DEVELOPER AND ADMINISTRATOR

Course Outline





## Course Overview:

This MongoDB Developer and Administrator course will help you master the concepts of data modeling, ingestion, query, sharding, and data replication with MongoDB, along with installing, updating, and maintaining the MongoDB environment. You will learn how to work on MongoDB configuration, backup methods, and monitoring and operational strategies.

## Course Highlights:

- 49 hours of Online Bootcamp
- 3 industry-based projects in the elearning and telecom domains
- 6 hands-on lab exercises to be executed in a virtual machine
- 60 demos explaining key concepts

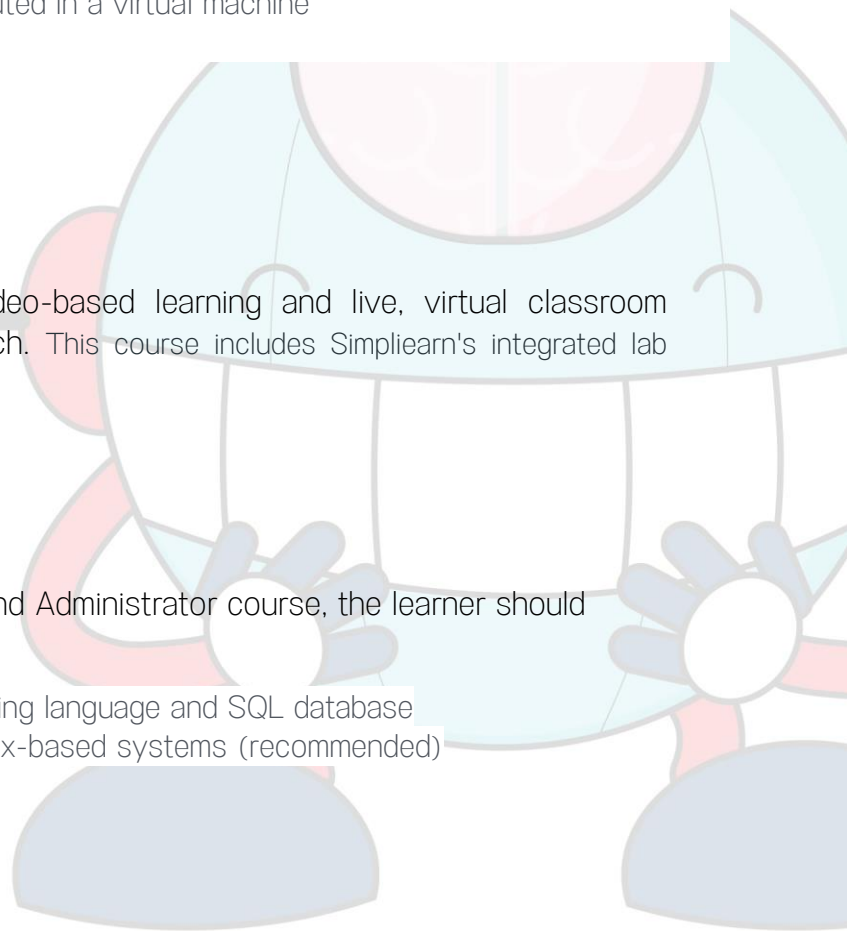
## Course Delivery Method:

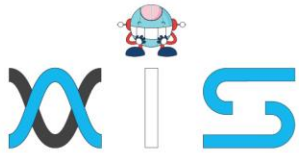
**Online Bootcamp-** Online, self-paced, video-based learning and live, virtual classroom conducted by the industry's leading coach. This course includes Simplilearn's integrated lab platform.

## Prerequisites:

In order to take this MongoDB Developer and Administrator course, the learner should have:

- A basic knowledge of any programming language and SQL database
- A working knowledge of Linux- or Unix-based systems (recommended)





## Skills Covered:

- Writing Java and NodeJs apps
- CRUD operations in MongoDB
- Replication and sharding
- Indexing and aggregation
- MongoDB tools and backup methods
- Replica sets

## Tools Covered:

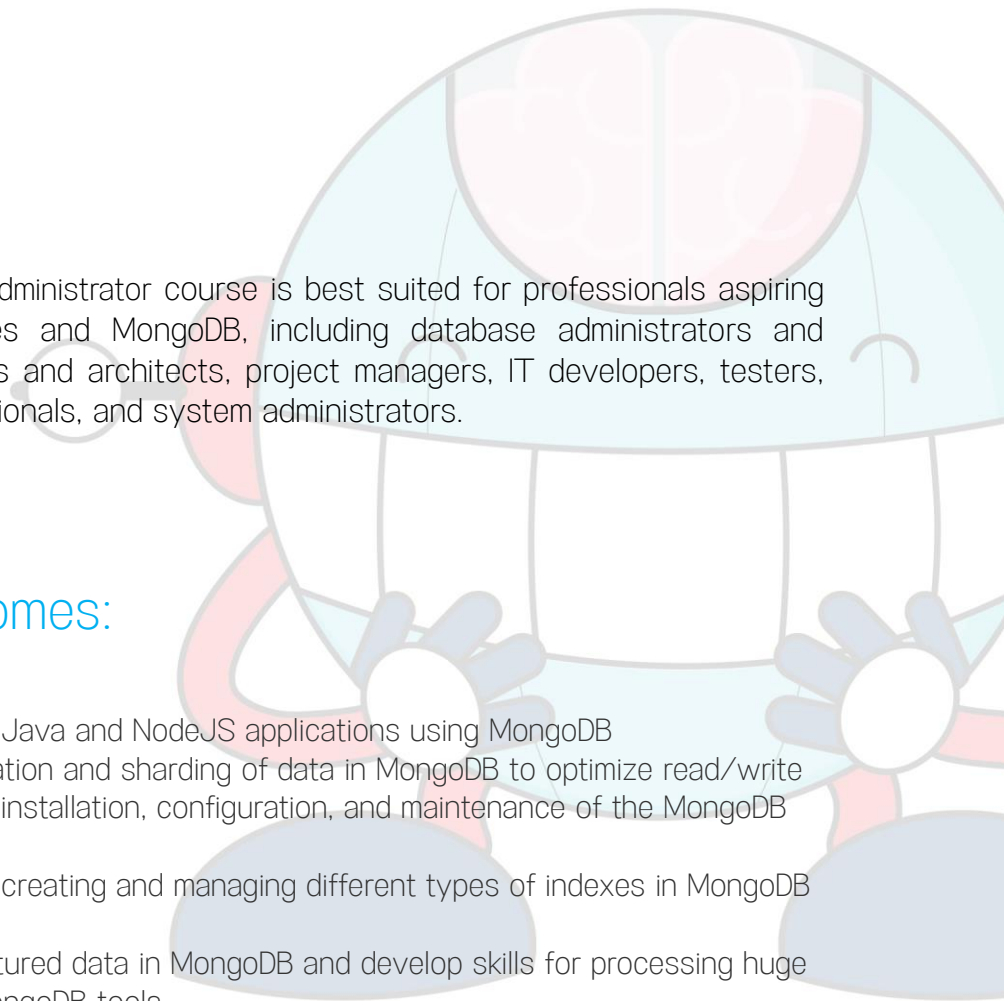
MongoDB, NoSQL

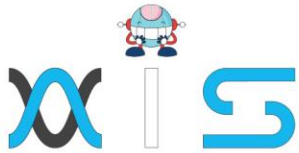
## Who Will Benefit:

This MongoDB Developer and Administrator course is best suited for professionals aspiring to work on NoSQL databases and MongoDB, including database administrators and architects, software developers and architects, project managers, IT developers, testers, analytics, and research professionals, and system administrators.

## Key Learning Outcomes:

- Develop expertise writing Java and NodeJS applications using MongoDB
- Master the skills of replication and sharding of data in MongoDB to optimize read/write performance and perform installation, configuration, and maintenance of the MongoDB environment
- Get hands-on experience creating and managing different types of indexes in MongoDB for query execution
- Proficiently store unstructured data in MongoDB and develop skills for processing huge amounts of data using MongoDB tools
- Gain proficiency in MongoDB configuration, backup methods, monitoring, and operational strategies





- Acquire an in-depth understanding of how to manage DB Notes, Replica set, and master-slave concepts

## Certification Criteria:

- Completion of at least 85 percent of online self-paced learning or attendance of one live virtual classroom
- A score of at least 75 percent in course-end assessment
- Successful evaluation in at least one project

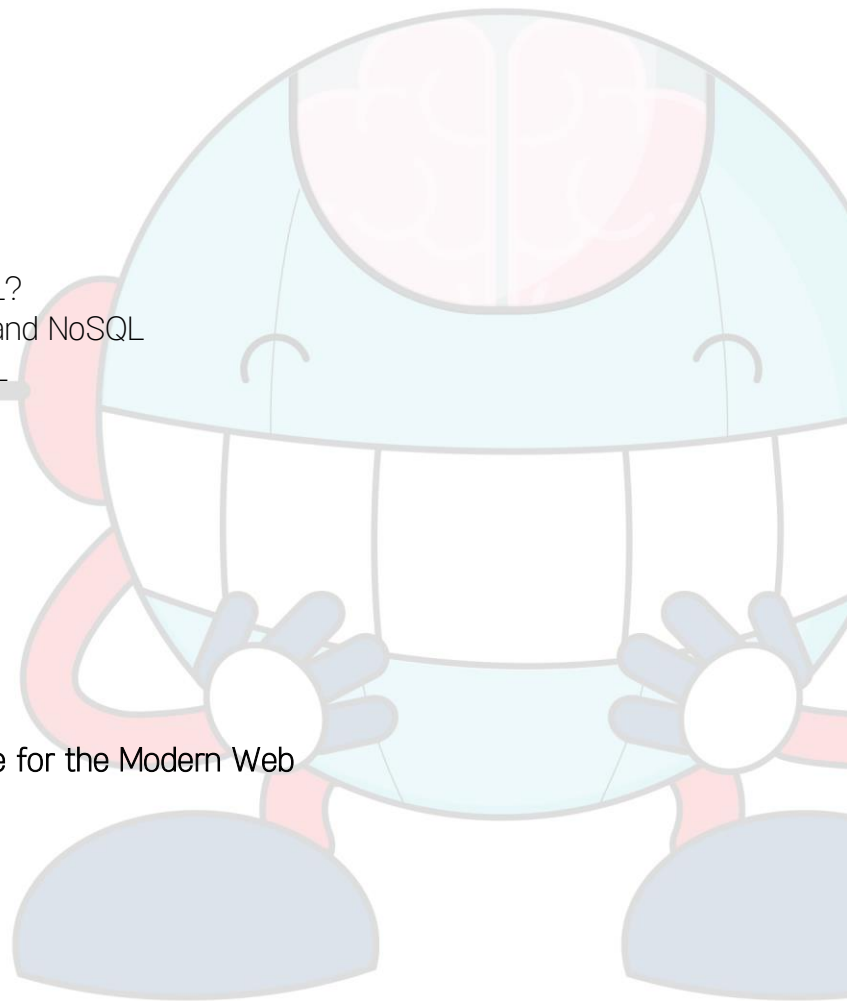
## Course Curriculum:

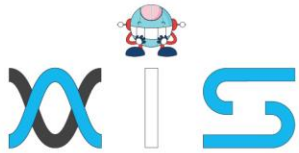
### Lesson 01 - NoSQL Database

- Introduction
- What is NoSQL? Why NoSQL?
- Difference Between RDBMS and NoSQL
- Databases Benefits of NoSQL
- Types of NoSQL
- Key-Value Database
- Document Database
- Column-Based Database
- Graph Database
- CAP Theorem
- Mongo DB as Per CAP

### Lesson 02 - MongoDB - A Database for the Modern Web

- What is MongoDB?
- JSON
- BSON
- MongoDB Structure
- Document Store Example
- MongoDB as a Document Database
- Transaction Management in MongoDB



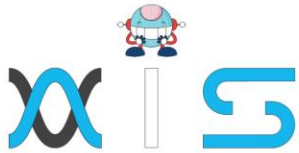


- Easy Scaling
- Scaling Up vs. Scaling Out
- Vertical Scaling and Horizontal Scaling
- Features of MongoDB
- Secondary Indexes
- Replication
- Memory Management
- Replica Set
- Auto Sharding
- Aggregation and MapReduce
- Collection and Database
- Schema Design and Modeling
- Reference Data Model
- Embedded Data Model
- Data Types
- Core Servers of MongoDB
- MongoDB's Tools
- MongoDB Installation
- Use Cases

### Lesson 03 - CRUD Operations in MongoDB

- Data Modification in MongoDB
- Batch Insert in MongoDB
- Ordered Bulk Insert and Unordered Bulk Insert
- Inserts: Internals and Implications
- Retrieving the documents
- Specify Equality Condition
- \$in "AND" Conditions
- \$or Operator
- Specify AND/OR Conditions
- Regular Expression
- Array Exact Match
- Array Projection Operators
- \$Where Query
- Cursor
- Pagination
- Advance Query Option





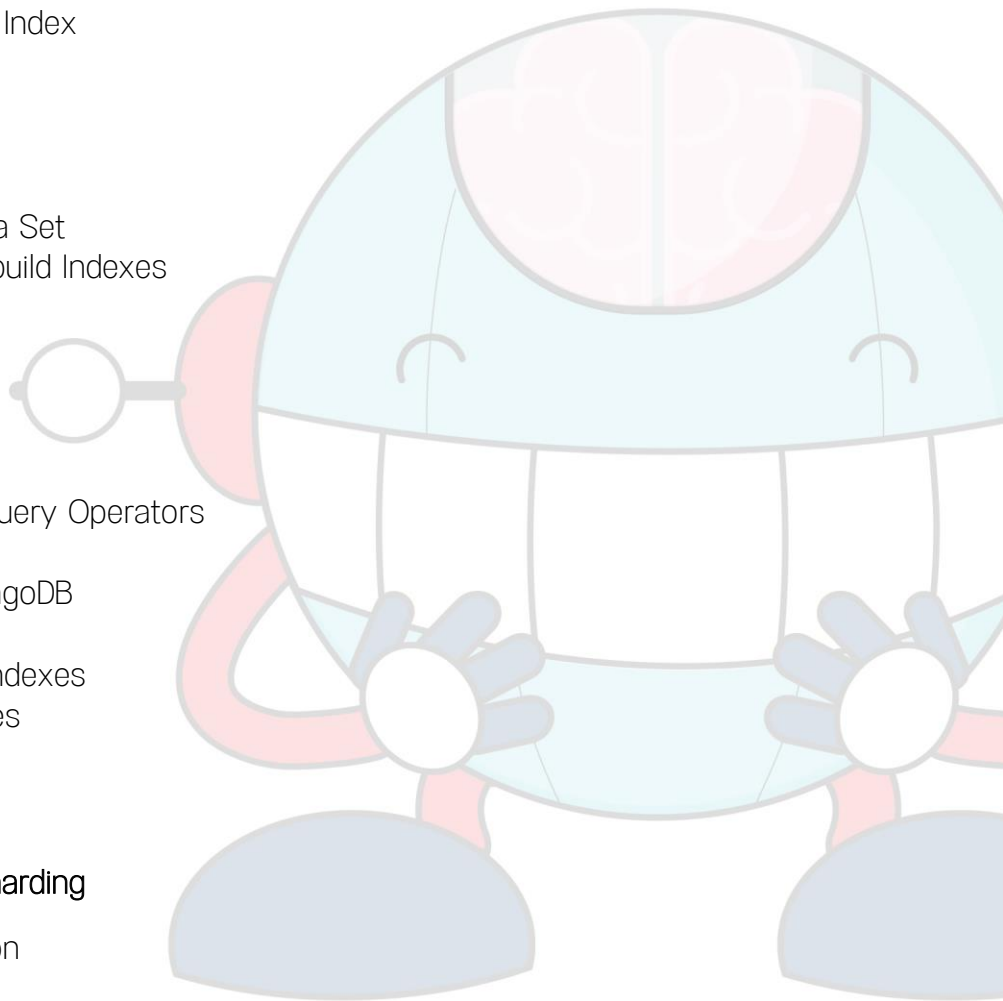
- Update Operation
- \$SET
- \$Unset and \$inc Modifiers
- \$Push and \$addToSet
- Positional Array Modifications
- Upsert
- Removing Documents

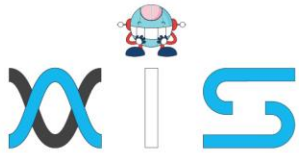
## Lesson 04 - Indexing and Aggregation

- Introduction to Indexing
- Types and Properties of Index
- Sort Order
- Text Indexes
- Text Search
- Index Creation
- Index Creation on Replica Set
- Remove, Modify, and Rebuild Indexes
- Listing Indexes
- Measure Index Use
- Control Index Use
- Index Use Reporting
- Geospatial Indexes
- MongoDB's Geospatial Query Operators
- \$GeoWith Operator
- Proximity Queries in MongoDB
- Aggregation
- Pipeline Operators and Indexes
- Aggregate Pipeline Stages
- MapReduce
- Aggregation Operations

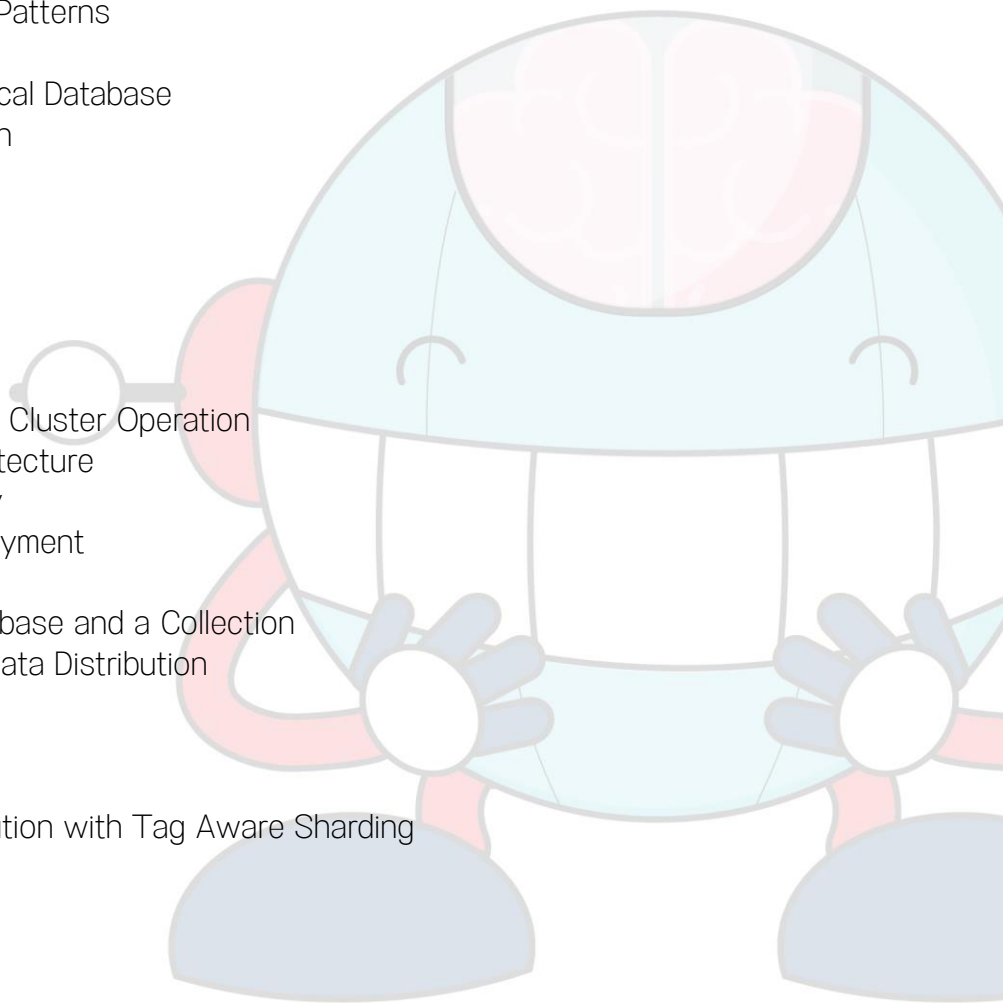
## Lesson 05 - Replication and Sharding

- Introduction to Replication
- Master-Slave Replication
- Replica Set in MongoDB
- Automatic Failover

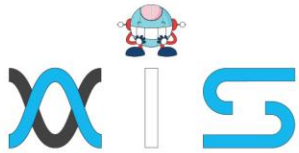




- Replica Set Members
- Write Concern
- Write Concern Levels
- Write Concern for a Replica Set
- Modify Default Write Concern
- Read Preference
- Read Preference Modes
- Blocking for Replication
- Tag Set
- Configure Tag Sets for Replica set
- Replica Set Deployment Strategies
- Replica Set Deployment Patterns
- Oplog File
- Replication State and Local Database
- Replication Administration
- Sharding
- When to Use Sharding?
- What is a Shard?
- Choosing a Shard Key
- Range-Based Shard Key
- Hash-Based Sharding
- Impact of Shard Keys on Cluster Operation
- Production Cluster Architecture
- Config Server Availability
- Production Cluster Deployment
- Add Shards to a Cluster
- Enable Sharding for Database and a Collection
- Maintaining a Balanced Data Distribution
- Splitting
- Chunk Size and Type
- Shard Balancing
- Customized Data Distribution with Tag Aware Sharding
- Tag Aware Sharding





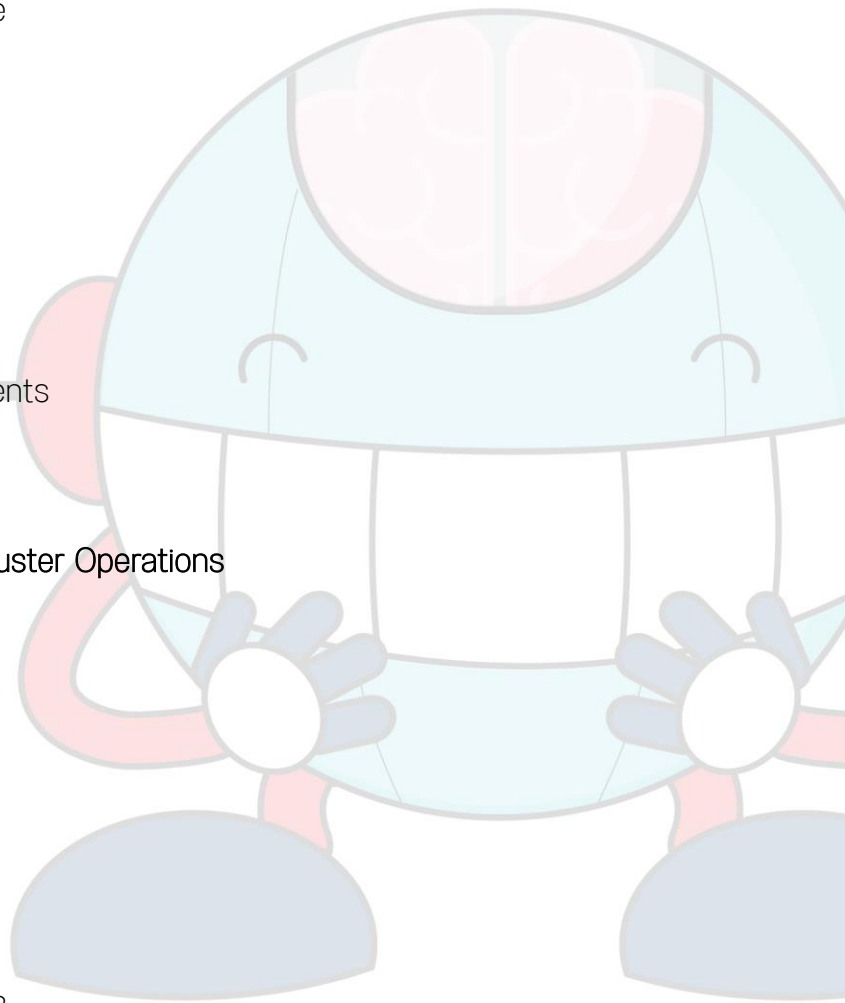


## Lesson 06 - Developing Java and Node JS Application with MongoDB

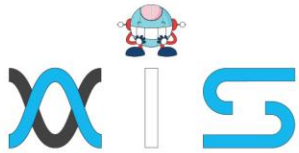
- Capped Collection
- TTL Collection Features
- GridFS
- MongoDB Drivers and Client Libraries
- Develop Java Application with MongoDB
- Connecting to MongoDB from Java Program
- Create Collection From Java Program
- Insert Documents From Java Program
- Retrieve Documents Using Java Code
- Update Documents Using Java Code
- Delete Documents Using Java Code
- Store Images Using GridFS API
- Retrieve Images Using GridFS API
- Remove Image Using GridFS API
- Connection Creation Using Node JS
- Insert Operations Using Node JS
- Update Operations Using Node JS
- Retrieve Documents Using Node JS
- Using DB Cursor to Retrieve Documents
- Mongoose ODM Module in Node JS
- Defining Schema Using Mongoose

## Lesson 07 - Administration of MongoDB Cluster Operations

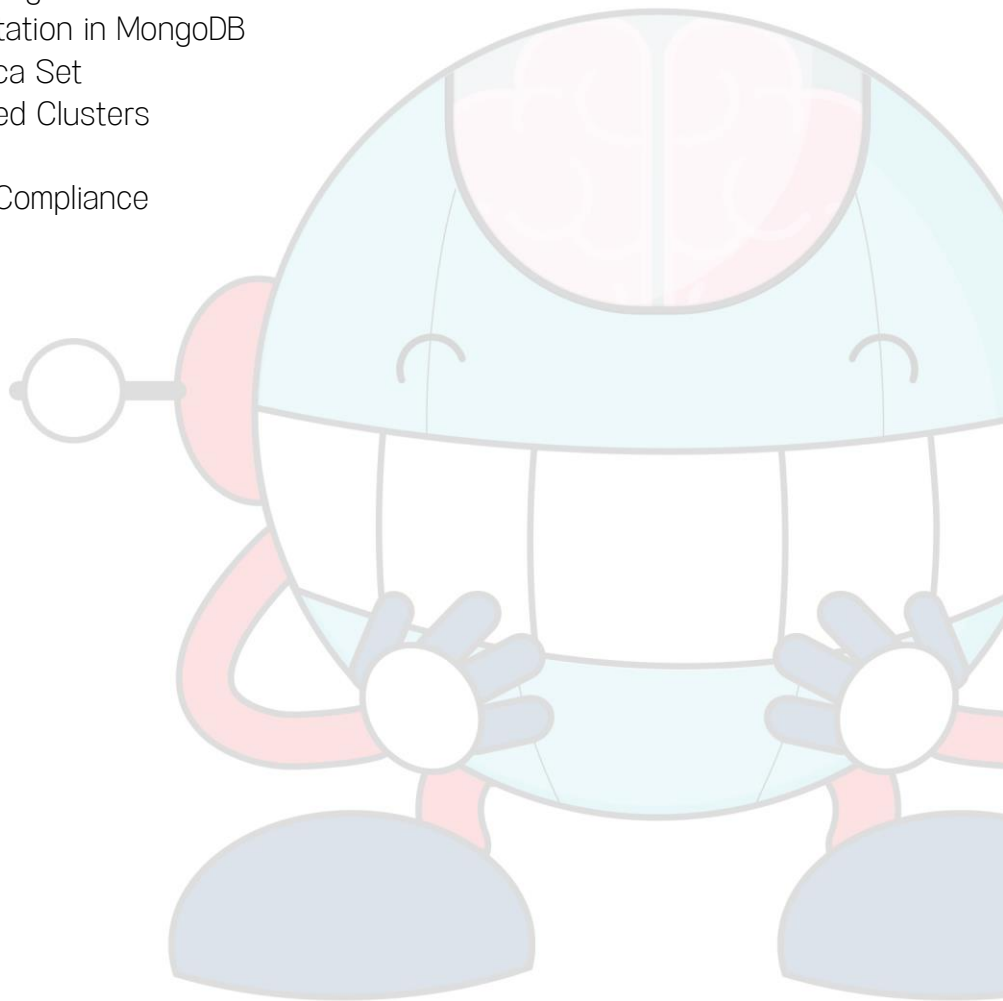
- Capped Collection
- TTL Collection Features
- GridFS
- Memory-Mapped Files
- Journaling Mechanics
- Storage Engines
- Power of 2-Sized Allocations
- No Padding Allocation Strategy
- Diagnosing Performance Issues
- Optimization Strategies for MongoDB
- Configure Tag Sets for Replica Set

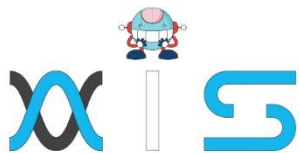






- Optimize Query Performance
- Monitoring Strategies for MongoDB
- MongoDB Utilities
- MongoDB Commands
- MongoDB Management Service (MMS)
- Data Backup Strategies in MongoDB
- Copying Underlying Data Files
- Backup with MongoDump
- Fsync and Lock
- MongoDB Ops Manager Backup Software
- Security Strategies in MongoDB
- Authentication Implementation in MongoDB
- Authentication in a Replica Set
- Authentication on Sharded Clusters
- Authorization
- End-to-End Auditing for Compliance





## AIS

With the rising demand in scalable technology, AIS provides tailored goal-setting based on your organization's needs and expectations. With products geared towards the growing needs of your organization's customers and employees, AIS has innovative and value-driven solutions.

### Learning Partners



#### SAS Management, Inc.

SAS Management, Inc. has been a leader in the training, certification and consulting services industry in the Philippines. With offices in Makati, Ortigas and Cebu, Philippines, the company has been the top training and consulting company for over 9 years. In its years of existence, it has provided certificates to over 100,000 professionals including 10,000 participants in the 160+ courses that have been conducted just during the 2020-2021 pandemic alone. The most sought-after courses being offered are ITIL, Project Management Professional (PMP)®, COBIT 5, Six Sigma Yellow Belt, Six Sigma Green Belt, PRINCE2, and organizational skills, among others.



#### Simplilearn

Simplilearn, based in California and India, is the world's #1 online bootcamp and one of the world's the leading certification and training providers. Simplilearn trained over 2,000,000 professionals with 2,000+ trainers and provides over 400 different courses.

### Technology Partner

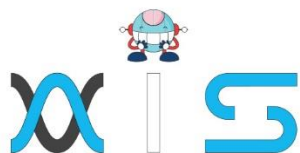


#### Freshworks

With over 40,000 customers, Freshworks is a business solutions software provider with products ranging from IT helpdesk and service desk, customer relationship management, live chat, marketing automation, phone system, and HR.

### Partners & Affiliates





*The program presented, as well as a wide range of programs are products of the partnership of AIS, SAS Management, Inc., and Simplilearn. With a common goal of providing the best practice of facilitating learning with an array of choices available in the online platform in this time of digitization.*

## Office Addresses

### NXT AIS Inc.

Juan Antonio III Building  
315 Maysilo Circle, Mandaluyong, Philippines

### SAS Management, Inc.

- **Head Office**

Unit 1602 Cityland 10 Tower  
2 6815 HV dela Costa cor Ayala Avenue  
Makati City, Philippines

- **Branch Office**

Unit 204 Villa Building  
Jupiter St. corner Makati Avenue  
Makati City, Philippines

- **Branch Office**

Room 201 2nd floor OLS Building  
443 Gorordo Avenue., Brgy. Kamputhaw  
Cebu City, Philippines

- **Branch Office**

Malaysia - SAS Management  
Sdn Bhd 6f-16, IOI Business Park,  
Persiaran Puchong Jaya  
47170, Selangor

### Simplilearn

- **Simplilearn Americas, Inc Pvt Ltd.**

201 Spear Street, Suite 1100,  
San Francisco, CA 94105 United States

- **Simplilearn Solutions Pte Ltd.**

NALANDA 53/1 C, Manoj Arcade, 24th Main Rd,  
Sector 2, HSR Layout, Bengaluru  
560102, Karnataka, India.

- **Simplilearn Singapore**

#14-302, The Plaza, 7500A Beach Rd,  
Singapore 199591