MONGODB

CURRICULUM

- **INTRODUCTION TO MONGODB – Architecture and Installation**
  - Basic concepts of a database
  - Database categories – NoSQL Databases
  - Types of NoSQL Databases
  - ACID and Base category
  - CAP Theorem
  - Introduction to MongoDB
  - Design goals for MongoDB server, database and tools
  - Concepts related to MongoDB
    - Collection
    - Documents
    - Key-Value
  - Introduction to JSON and BSON documents
  - Setting up MongoDB

  HANDS-ON/DEMO/USE-CASE :- MongoDB installation

- **SCHEMA DESIGN AND DATA MODELLING**
  - Data Modelling concepts and approach
  - Analogy between RDBMS and MongoDB
  - Challenges for Data Modelling in MongoDB
  - Data Modelling examples and patterns
  - Model relationship between documents
  - Model tree structure

  HANDS-ON/DEMO/USE-CASE :- HR data modeling

- **CRUD OPERATION**
  - MongoDB development architecture
  - MongoDB production architecture
  - MongoDB CRUD operation
  - Query optimization
  - Data Reading and Writing operation
  - MongoDB datatypes
  - CRUD syntax and queries

  HANDS-ON/DEMO/USE-CASE :- MongoDB CRUD Operation

- **INDEXING AND AGGREGATION FRAMEWORK**
  - Index introduction, concepts, types and properties

- o Index Creation and Reference
- o Introduction to aggregation
- o Approach to aggregation
- o Types of aggregation
- o Performance Tuning

HANDS-ON/DEMO/USE-CASE :- Work with Aggregation

🔴 MONGODB ADMINISTRATION
- o Administration concept in MongoDB
- o Monitoring issues related to MongoDB
- o Monitoring at server, database and collection level
- o Database profiling, locks, memory usage, no connection, page fault
- o Backup and recovery methods of MongoDB
- o Export and Import data to and from MongoDB
- o Run time configutaion of MongoDB
- o Production Notes and Best Practices

HANDS-ON/DEMO/USE-CASE :- Backup-Restoration and Export-Import

🔴 SCALABILITY AND AVAILABILITY
- o Introduction to Replication
- o Concepts around replication
- o Master-Slave Replication
- o Setting up and Managing replica set
- o Introduction to Sharding
- o Concepts around sharding, shard keys
- o Config Server, Query Router
- o Setting up and Managing Sharding
- o Types of Sharding

HANDS-ON/DEMO/USE-CASE :- Implementation of Replication and Sharding

🔴 MONGODB SECURITY
- o Security Introduction
- o Security Concepts
- o Implementation of Security on MongoDB

🔴 APPLICATION ENGINEERING
- o MongoDB Package components
- o Configuration File options
- o MongoDB Limits and Thresholds
- o MongoDB Integration with R
- o HTTP and REST Interface

HANDS-ON/DEMO/USE-CASE :- MongoDB Integration with R

- **MONGODB ON CLOUD**
  - o Introduction to MongoDB Atlas

- **DIAGNOSTICS AND FIXES**
  - o Diagnostic tools
  - o Diagnostic commands
  - o Slow Queries
  - o Connectivity