



MARRI LAXMAN REDDY

INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(AN AUTONOMOUS INSTITUTION)

(Approved by AICTE, New Delhi & Affiliated to JNTUH, Hyderabad)

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

2430597 NO SQL DATA BASES – (MONGO DB) LAB

B. Tech. II Year-I Sem

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COURSE OUTCOMES - CO'S

- Understand MongoDB data types, data modeling, and installation procedures.
- Apply various **query, projection, and update operators** to interact with MongoDB data.
- Perform operations such as **create, drop, and list** collections and databases.
- Use advanced features such as **text search, upserts, multi-update, and wire protocol** methods.
- Connect MongoDB with programming languages like **Java, PHP, and Python**, implementing

real-world integration scenarios.

LIST OF EXPERIMENTS:

Module I: Introduction of MongoDB , No SQL Database , Advantage over RDBMS ,MongoDB Data Types, Install MongoDB, MongoDB Data Modeling

1. **Create and Explore a NoSQL Document Structure**

- Insert sample JSON documents to show flexible schemas.

2. **Compare RDBMS vs. MongoDB with a Practical Schema**

- Model the same data (e.g., user accounts) in SQL and MongoDB.

3. **Explore MongoDB Data Types**

- Insert and query documents using types like String, NumberInt, Boolean, Array, Date, etc.

4. **Basic MongoDB Data Modeling Example**

- Design an embedded vs. referenced model for blog posts and comments.

Module II : Operators: Query & Projection Operator, MongoDB Update Operator, Aggregation Pipeline Stages ,MongoDB limit(), MongoDB sort() ,Query Modifiers Commands: Aggregation Commands, Geospatial Command ,Query and Write Operation Commands, Query Plan Cache Commands, Authentication Commands ,User Management Commands, Role Management Commands ,Replication Command ,Sharding Commands ,Session Commands

1. Use Query and Projection Operators

- Demonstrate \$eq, \$gt, \$lt, \$in, \$and, \$or, \$exists, and projection { field: 1 }.

2. Update Operators and Aggregation Stages

- Use \$set, \$inc, \$push in update, and pipeline stages like \$match, \$group, \$sort.

3. Sorting, Limiting, and Modifying Queries

- Apply .limit(), .sort(), and modifiers like .explain(), .hint().

4. Geospatial Commands and User Management

- Insert geoJSON data and run \$geoWithin queries; create users and assign roles.

Module III: Create Database, Drop Database, Create Collection, Drop Collection

1. Create and Drop a Database

- Use use dbName, db.dropDatabase().

2. Create and Drop Collections

- db.createCollection("students"), db.students.drop().

3. Explore Collection Indexes and Options

- Create indexes and check with db.collection.getIndexes().

4. Set Up Schema Validation Rules

- Use JSON schema validation to restrict document structure.

Module IV: Insert Documents ,Update Documents, Delete Documents, Query Documents ,SQL to MongoDB Mapping ,MongoDB text search, Partial Updates & Document Limits, Removing Documents , Multi Update , Upsert, Wire Protocol ,Bulk() Operations and Methods ,Common Commands, db.runCommand() ,db.isMaster() ,db.serverStatus() , db.currentOp() & db.killOp() ,collection.stats() & collection.drop()

1. **CRUD: Insert, Query, Update, Delete Documents**
 - Full example of inserting, querying with filters, updating fields, and deleting.
2. **Use of db.runCommand() and Server Info**
 - Run db.runCommand({ serverStatus: 1 }) and db.isMaster().
3. **Bulk Operations and Upsert Example**
 - Demonstrate bulkWrite() with mixed inserts and updates.
4. **Check Collection Stats and Perform Partial Updates**
 - db.collection.stats(), \$set with field targeting.

Module V: MongoDB Shell ,Shell Collection Methods, Cursor Method , MongoDB Database Commands, Query Plan Cache Methods , User Management Method ,Role Management Method ,MongoDB Replication Methods Connectivity: Java MongoDB ,PHP MongoDB, Python MongoDB

1. **Using MongoDB Shell: Collection and Cursor Methods**
 - Demonstrate .find(), .countDocuments(), .forEach(), .toArray().
2. **Query Plan Cache and Role Management Commands**
 - db.collection.getPlanCache().clear() and role creation with db.createRole().
3. **Python MongoDB CRUD App using PyMongo**
 - Connect to MongoDB Atlas/local, and perform CRUD using Python.
4. **Java MongoDB Connection Example**

Use MongoDB Java Driver to connect and run basic operations