MES College of Engineering Pune-01

Department of Computer Engineering

Name of Student:	**Class:**
Semester/Year:	**Roll No:**
Date of Performance:	**Date of Submission:**
Examined By:	**Experiment No: Part B-01**

GROUP: B) ASSIGNMENT NO: 01

AIM: MongoDB Queries:

Design and Develop MongoDB Queries using CRUD operations.(Use CRUD operations, SAVE method, logical operators etc.).

OBJECTIVES:

- To develop basic, intermediate and advanced Database programming skills.
- To develop basic Database administration skill.
- To Study NoSQL database.
- To Study document oriented database-Mongodb.

APPRATUS:

- Operating System recommended: 64-bit Open source Linux or its derivative.
- Front End: Java/PHP/Python
- Back End: MongoDB

THEORY:

1. **What is MongoDB?**
   - MongoDB is an open-source document database that provides high performance, high availability, and automatic scaling.
   - A record in MongoDB is a document, which is a data structure composed of field and value pairs.
   - MongoDB documents are BSON documents. BSON is a binary representation of JSON with additional type information.
   - A document is the basic unit of data for MongoDB and is roughly equivalent to a row in a relational database management system.

- A collection is a group of documents. If a document is the MongoDB analog of a row in a relational database, then a collection are analog to a table.
- MongoDB is type-sensitive and case-sensitive.
- Every document has a special key, "_id", that is unique within a collection.
- In the documents, the value of a field can be any of the BSON data types, including other documents, arrays, and arrays of documents.

```
{
        Name: “Sagar”,
        Class: “TE Comp”,
        College: “MESCOE”,
        Age: 26,
        Subject: [“DMSA”, “OSD”, “FCA”, “DCWSN”, “TOC”]
}
```

Fig: MongoDB document

2. MongoDB Create Database

- **The use Command**
  - ✓ MongoDB use DATABASE_NAME is used to create database. The command will create a new database; if it doesn't exist otherwise it will return the existing database.

Syntax: >use DATABASE_NAME

Example:
```
>use mydb
switched to db mydb
```

- ✓ To check your currently selected database uses the command db.

```
>db
mydb
```

- ✓ If you want to check your databases list, then use the command show dbs.

```
>show dbs
local     0.78125GB
test      0.23012GB
```

- ✓ Your created database (mydb) is not present in list. To display database you need to insert atleast one document into it.
- ✓ In mongodb default database is test. If you didn't create any database then collections will be stored in test database.

3. **MongoDB Drop Database**

- **The dropDatabase () Method**

MongoDB db.dropDatabase () command is used to drop a existing database.

Syntax: db.dropDatabase()

This will delete the selected database. If you have not selected any database, then it will delete default 'test' database.

4. **MongoDB Create Collection**

- **The createCollection() Method**

MongoDB db.createCollection(name, options) is used to create collection. In the command, name is name of collection to be created. Options are a document and used to specify configuration of collection. Options parameter is optional, so you need to specify only name of the collection.

Syntax: db.createCollection(name, options)

Examples: Basic syntax of createCollection() method without options is as follows:

```
>use test
switched to db test
>db.createCollection("mycollection")
{ "ok" : 1 }
```

5. **MongoDB Drop Collection**

- **The drop() Method**

MongoDB's db.collection.drop() is used to drop a collection from the database.

Syntax: db.COLLECTION_NAME.drop()

6. **MongoDB - Insert Document**

- **The insert() Method**

To insert data into MongoDB collection, you need to use MongoDB's insert() , update() or save () method.

Syntax: db.COLLECTION_NAME.insert(document)

7. **MongoDB - Query Document**

- **The find() Method**

To query data from MongoDB collection, you need to use MongoDB's find() method. Find() method will display all the documents in a non-structured way.

Syntax: db.COLLECTION_NAME.find()

- **The pretty() Method**

To display the results in a formatted way, you can use pretty() method.

Syntax: db.COLLECTION_NAME.find().pretty()

- **The forEach() Method**

  To display the results in a JSON format, you can use forEach() method.

  Syntax: db.COLLECTION_NAME.find().forEach(printjson)

8. MongoDB Update Document

MongoDB's update() and save() methods are used to update document into a collection. The update() method update values in the existing document while the save() method replaces the existing document with the document passed in save() method.

- **MongoDB Update() method**

  The update() method updates values in the existing document.

  Syntax:

  db.COLLECTION_NAME.update(SELECTIOIN_CRITERIA,UPDATED_DATA)

- **MongoDB Save() Method**

  The save() method replaces the existing document with the new document passed in save() method.

  Syntax: db.COLLECTION_NAME.save({_id:ObjectId(),NEW_DATA})

9. MongoDB Delete Document

- **The remove() Method**

  MongoDB's remove() method is used to remove document from the collection. remove() method accepts two parameters. One is deletion criteria and second is justOne flag

  1. Deletion criteria: (Optional) deletion criteria according to documents will be removed.

  2. justOne: (Optional) if set to true or 1, then remove only one document.

  Syntax: db.COLLECTION_NAME.remove(DELLETION_CRITTERIA)

IMPLEMENTATION:

A. Create Empdb database

B. Create Employee collection by considering following Fields:

   i. Empid: Number

   ii. Name: Embedded Doc (FName, LName)

   iii. Company Name: String

   iv. Salary: Number

   v. Designation: String

vi. Age: Number
vii. Expertise: Array
viii. DOB: String or Date
ix. Email id: String
x. Contact: String
xi. Address: Array of Embedded Doc (PAddr, LAddr)

C. Insert at least 10 documents in Employee Collection and execute following statements:

1. Select all documents where the Designation field has the value "Programmer" and the value of the salary field is greater than 30000.
2. Creates a new document if no document in the employee collection contains
3. {Designation: "Tester", Company_name: "TCS", Age: 25}
4. Selects all documents in the collection where the field age has a value less than 30 or the value of the salary field is greater than 40000.
5. Matches all documents where the value of the field Address is an embedded document that contains only the field city with the value "Pune" and the field Pin_code with the value "411001".
6. Finds all documents with Company_name: "TCS" and modifies their salary field by 2000.
7. Find documents where Designation is not equal to "Developer".
8. Find _id, Designation, Address and Name from all documents where Company_name is "Infosys".
9. Selects all documents in the employee collection where the value of the Designation is either "Developer" or "Tester".
10. Find all document with Exact Match on an Array having Expertise: ['Mongodb','Mysql', 'Cassandra']
11. Drop Single documents where designation="Developer"

CONCLUSION:

QUESTIONS:

1. What is NoSQL and enlist its benefits.
2. Shows the relationship of RDBMS terminology with MongoDB.

3. Explain CRUD operations in MongoDB database with suitable Example
4. What are Advantages of MongoDB over RDBMS?
5. Enlist Basic datatypes of MongoDB.
6. What is different between SAVE and UPDATE method.
7. What is ObjectId in Mongodb?
8. Explain different method to insert document in Mongodb.
9. Explain CAP & BASE Theorem in NoSQL with Suitable Example.
10. What are different key feature of MongoDB.