



## Worksheet 10

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### **1. Aim: Perform CRUD Operations using No-SQL Database: MongoDB**

### **2. Objective:**

- Create and manage databases and collections.
- Perform **CRUD operations** — Create, Read, Update, and Delete documents.
- Use **aggregation** for grouping and summarizing data.
- Understand how to modify, query, and manage collections efficiently in MongoDB.
- Gain practical experience with real-world data handling through command-line operations.

### **3. Code:**

```
// 1. Show all databases show
```

```
use
```

```
// 2. Create or switch to your database use
```

```
db_ayush
```

```
// 3. Check current database db
```

```
// 4. Create a collection (optional)
```

```
db.createCollection("movies") //
```

```
5. Insert Operations
```

```
db.movies.insertOne({ title:
```

```
"Inception", director:
```

```
"Christopher Nolan", year: 2010,
```

```
rating: 8.8,
```



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```
genre: "Sci-Fi",
```

```
features: ["Mind-bending", "Action"], added_by:
```

```
"Shivanshu"
```

```
})
```

```
db.movies.insertMany([
```

```
{
```

```
  title: "Interstellar",
```

```
  director: "Christopher Nolan",
```

```
  year: 2014, rating: 8.6, genre:
```

```
  "Sci-Fi", features: ["Space",
```

```
  "Drama"], added_by:
```

```
  "Shivanshu"
```

```
},
```

```
{
```

```
  title: "Avatar",
```

```
  director: "James Cameron",
```

```
  year: 2009,
```

```
  rating: 7.8,
```

```
  genre: "Adventure", features:
```

```
  ["3D", "Action"], added_by:
```

```
  "Shivanshu"
```

```
},
```



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```
{ title: "The Dark  
Knight", director:  
"Christopher Nolan",  
year: 2008, rating: 9.0,  
genre: "Action",  
features: ["Batman",  
"Crime"], added_by:  
"Shivanshu"  
}
```

```
]
```

```
// 6. Show all collections show collections // 7.
```

```
Read Operations db.movies.find().pretty()
```

```
db.movies.findOne() db.movies.find({}, { title:
```

```
1, year: 1, _id: 0 }) db.movies.find({ genre:
```

```
"Action" }) db.movies.find({ "details.language":
```

```
"English" })
```

```
// 8. Update Operations
```

```
db.movies.updateOne(
```

```
{ title: "Avatar" },
```

```
{ $set: { rating: 8.1, genre: "Sci-Fi Adventure" } }
```

```
)
```

```
db.movies.updateOne(
```

```
{ title: "Inception" },
```



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```
{ $push: { features: "Thriller" } }  
  
)  
db.movies.updateOne(  
  
  { title: "Inception" },  
  
  { $pull: { features: "Action" } }  
  
)  
  
db.movies.updateMany(  
  
  { director: "Christopher Nolan" },  
  
  { $set: { language: "English" } }  
  
)  
  
db.movies.updateMany({}, { $unset: { added_by: "" } })  
  
db.movies.updateMany({}, { $set: { color: "Full HD" } })  
  
db.movies.updateOne(  
  
  { title: "Tenet" },  
  
  { $set: { director: "Christopher Nolan", year: 2020, rating: 7.5 } },  
  
  { upsert: true }  
  
)  
  
// 9. Delete Operations db.movies.deleteOne({ title:  
"Avatar" }) db.movies.deleteMany({ director:  
"Christopher Nolan" }) db.movies.deleteMany({}) // 10.  
  
Grouping (Aggregation) db.movies.aggregate([  
  
  { $group: { _id: "$director", total_movies: { $sum: 1 } } }
```



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db.movies.aggregate([

```
{ $group: { _id: "$genre", total_movies: { $sum: 1 } } }
```

```
})
```

```
// 11. Drop collection
```

```
db.movies.drop() //
```

```
12. Drop database
```

```
db.dropDatabase()
```

## 4. Output:

```
shivanshuranjansingh@Shivanshu-MacBook ~ % mongosh
Current Mongosh Log ID: 600399ad55d128fad2120e1b
Connecting to:      mongodb://127.0.0.1:27017/?directConnection=true&serverSelectionTimeoutMS=2000&appName=mongosh+2.5.8
Using MongoDB:      7.0.25
Using Mongosh:      2.5.8

For mongosh info see: https://www.mongodb.com/docs/mongodb-shell/

=====
The server generated these startup warnings when booting
2025-10-30T22:06:06.549+05:30: Access control is not enabled for the database. Read and write access to data and configuration is unrestricted
=====

test> show dbs
|
| admin          48.00 KiB
| config         108.00 KiB
| db_shivanshu   60.00 KiB
| local          72.00 KiB
test> use db_shivanshu
switched to db db_shivanshu
db_shivanshu> db.createCollection("movies")
{ ok: 1 }
db_shivanshu> 
```

```
db_shivanshu> db.movies.insertOne({
  title: "Inception",
  director: "Christopher Nolan",
  year: 2010,
  rating: 8.8,
  genre: "Sci-Fi",
  features: ["Mind-bending", "Action"],
  added_by: "Shivanshu"
})

acknowledged: true,
insertedId: ObjectId('690399fe55d128fad2120e1c')
}
db_shivanshu> db.movies.insertMany([
  {
    title: "Interstellar",
    director: "Christopher Nolan",
    year: 2014,
    rating: 8.6,
    genre: "Sci-Fi",
    features: ["Space", "Drama"],
    added_by: "Shivanshu"
  },
  {
    title: "Avatar",
    director: "James Cameron",
    year: 2009,
    rating: 7.8,
    genre: "Adventure",
    features: ["3D", "Action"],
    added_by: "Shivanshu"
  },
  {
    title: "The Dark Knight",
    director: "Christopher Nolan",
    year: 2008,
    rating: 9.0,
    genre: "Action",
    features: ["Batman", "Crime"],
    added_by: "Shivanshu"
  }
])

acknowledged: true,
insertedIds: {
  '0': ObjectId('690399fe55d128fad2120e1d'),
  '1': ObjectId('690399fe55d128fad2120e1e'),
  '2': ObjectId('690399fe55d128fad2120e1f')
}
db_shivanshu>
```

```
db_shivanshu> db.movies.find()
[
  {
    _id: ObjectId('690399f655d128fad2120e1c'),
    title: 'Inception',
    director: 'Christopher Nolan',
    year: 2010,
    rating: 8.8,
    genre: 'Sci-Fi',
    features: [ 'Mind-bending', 'Action' ],
    added_by: 'Shivanshu'
  },
  {
    _id: ObjectId('690399fe55d128fad2120e1d'),
    title: 'Interstellar',
    director: 'Christopher Nolan',
    year: 2014,
    rating: 8.6,
    genre: 'Sci-Fi',
    features: [ 'Space', 'Drama' ],
    added_by: 'Shivanshu'
  },
  {
    _id: ObjectId('690399fe55d128fad2120e1e'),
    title: 'Avatar',
    director: 'James Cameron',
    year: 2009,
    rating: 7.8,
    genre: 'Adventure',
    features: [ '3D', 'Action' ],
    added_by: 'Shivanshu'
  },
  {
    _id: ObjectId('690399fe55d128fad2120e1f'),
    title: 'The Dark Knight',
    director: 'Christopher Nolan',
    year: 2008,
    rating: 9,
    genre: 'Action',
    features: [ 'Batman', 'Crime' ],
    added_by: 'Shivanshu'
  }
]
db_shivanshu> db.movies.findOne()
[[
  {
    _id: ObjectId('690399f655d128fad2120e1c'),
    title: 'Inception',
    director: 'Christopher Nolan',
    year: 2010,
    rating: 8.8,
    genre: 'Sci-Fi',
    features: [ 'Mind-bending', 'Action' ],
    added_by: 'Shivanshu'
  }
]
```

```
db_shivanshu> db.movies.find({ title: 1, year: 1, _id: 0 })
[
  [
    { title: 'Inception', year: 2010 },
    { title: 'Interstellar', year: 2014 },
    { title: 'Avatar', year: 2009 },
    { title: 'The Dark Knight', year: 2008 }
  ]
]
db_shivanshu> db.movies.find({ genre: "Action" })
[
  [
    {
      _id: ObjectId('690399fe55d128fad2120e1f'),
      title: 'The Dark Knight',
      director: 'Christopher Nolan',
      year: 2008,
      rating: 9,
      genre: 'Action',
      features: [ 'Batman', 'Crime' ],
      added_by: 'Shivanshu'
    }
  ]
]
db_shivanshu> db.movies.find({ "details.language": "English" })
[
  [
    {
      _id: ObjectId('690399fe55d128fad2120e1f'),
      title: 'The Dark Knight',
      director: 'Christopher Nolan',
      year: 2008,
      rating: 9,
      genre: 'Action',
      features: [ 'Batman', 'Crime' ],
      added_by: 'Shivanshu'
    }
  ]
]
db_shivanshu>
```

```
db_shivanshu> db.movies.updateOne(
| { title: "Avatar" },
| { $set: { rating: 8.1, genre: "Sci-Fi Adventure" } }
| )
|
| {
| {
| acknowledged: true,
| insertedId: null,
| matchedCount: 1,
| modifiedCount: 1,
| upsertedCount: 0
| }
| }
|
| db_shivanshu> db.movies.updateOne(
| { title: "Inception" },
| { $push: { features: "Thriller" } }
| )
|
| {
| {
| acknowledged: true,
| insertedId: null,
| matchedCount: 1,
| modifiedCount: 1,
| upsertedCount: 0
| }
| }
|
| db_shivanshu> db.movies.updateOne(
| { title: "Inception" },
| { $pull: { features: "Action" } }
| )
|
| {
| {
| acknowledged: true,
| insertedId: null,
| matchedCount: 1,
| modifiedCount: 1,
| upsertedCount: 0
| }
| }
|
| db_shivanshu> db.movies.updateMany(
| { director: "Christopher Nolan" },
| { $set: { language: "English" } }
| )
|
| {
| {
| acknowledged: true,
| insertedId: null,
| matchedCount: 3,
| modifiedCount: 3,
| upsertedCount: 0
| }
| }
| }
```

```
db_shivanshu> db.movies.updateMany({}, { $unset: { added_by: "" } })
|
| {
| {
| acknowledged: true,
| insertedId: null,
| matchedCount: 4,
| modifiedCount: 4,
| upsertedCount: 0
| }
| }
|
| db_shivanshu> db.movies.updateMany({}, { $set: { color: "Full HD" } })
|
| {
| {
| acknowledged: true,
| insertedId: null,
| matchedCount: 4,
| modifiedCount: 4,
| upsertedCount: 0
| }
| }
|
| db_shivanshu> db.movies.updateOne(
| { title: "Tenet" },
| { $set: { director: "Christopher Nolan", year: 2020, rating: 7.5 } },
| { upsert: true }
| )
|
| {
| {
| acknowledged: true,
| insertedId: ObjectId('69039ac0e681e6eb85a7e326'),
| matchedCount: 0,
| modifiedCount: 0,
| upsertedCount: 1
| }
| }
|
| db_shivanshu> █
```

```
db_shivanshu> db.movies.deleteOne({ title: "Avatar" })
|
| { acknowledged: true, deletedCount: 1 }
|
| db_shivanshu> db.movies.deleteMany({ director: "Christopher Nolan" })
|
| { acknowledged: true, deletedCount: 4 }
|
| db_shivanshu> db.movies.deleteMany({})
|
| { acknowledged: true, deletedCount: 0 }
|
| db_shivanshu> █
```



```
db_shivanshu> db.movies.aggregate([
|   { $group: { _id: "$director", total_movies: { $sum: 1 } } }
| ])
[ ]

db_shivanshu> db.movies.aggregate([
|   { $group: { _id: "$genre", total_movies: { $sum: 1 } } }
| ])
[ ]

db_shivanshu> █
```

```
db_shivanshu> db.movies.drop()
[ ]
true
db_shivanshu> db.dropDatabase()
[ ]
{ ok: 1, dropped: 'db_shivanshu' }
db_shivanshu> █
```

## 5. Learning Outcomes:

- Understand the structure and working of MongoDB as a NoSQL database.
- Create and manage databases and collections using MongoDB commands.
- Perform CRUD (Create, Read, Update, Delete) operations on documents.
- Apply aggregation operations for data grouping and analysis.
- Gain practical skills in handling and modifying data using MongoDB shell.