

Experiment - 10

Student Name: Harjit Singh

UID: 23BCS10849

Branch: BE-CSE

Section/Group: KRG_2B

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Subject Name: Advanced Database and Management System

Subject Code: 23CSP-333

1. Problem Description/Aim:

To perform and understand fundamental MongoDB operations — including insertion, reading, updating, deletion, and aggregation — for efficient data handling and management in a NoSQL database environment.

2. Objective:

1. To learn how to insert single and multiple documents using `insertOne()` and `insertMany()`.
2. To apply various `find()` queries for data retrieval, including conditional and projection-based queries.
3. To practice updating records using `updateOne()`, `updateMany()`, `$push`, `$pull`, `$unset`, and `$upsert`.
4. To execute deletion commands (`deleteOne()`, `deleteMany()`) and aggregation using `$group` and `$sum` for data analysis.

3. MONGODB OPERATION AND OUTPUTS -

```
test> use bookstore_db
switched to db bookstore_db
bookstore_db> db.books.insertOne({
...   title: "The Alchemist",
...   author: "Paulo Coelho",
...   genre: "Fiction",
...   price: 450,
...   pages: 208,
...   publisher: "HarperCollins",
...   fuel_type: "N/A",
...   features: ["Inspirational", "Adventure"],
...   available: true
... })
{
  acknowledged: true,
  insertedId: ObjectId('6904922c66c37ffc0663b112')
}
bookstore_db>
```

```
bookstore_db> db.books.insertMany([
...   {
...     title: "Atomic Habits",
...     author: "James Clear",
...     genre: "Self-Help",
...     price: 550,
...     pages: 320,
...     publisher: "Penguin",
...     fuel_type: "N/A",
...     features: ["Productivity", "Motivation"],
...     available: true
...   },
...   {
...     title: "Wings of Fire",
...     author: "A.P.J. Abdul Kalam",
...     genre: "Autobiography",
...     price: 400,
...     pages: 180,
...     publisher: "Universities Press",
...     fuel_type: "N/A",
...     features: ["Inspiration", "Biography"],
...     available: false
...   },
...   {
...     title: "Deep Work",
...     author: "Cal Newport",
...     genre: "Self-Help",
...     price: 600,
...     pages: 304,
...     publisher: "Grand Central",
...     fuel_type: "N/A",
...     features: ["Focus", "Discipline"],
...     available: true
...   }
... ])
```

```
bookstore_db> db.books.find()
[
  {
    _id: ObjectId('6904922c66c37ffc0663b112'),
    title: 'The Alchemist',
    author: 'Paulo Coelho',
    genre: 'Fiction',
    price: 450,
    pages: 208,
    publisher: 'HarperCollins',
    fuel_type: 'N/A',
    features: [ 'Inspirational', 'Adventure' ],
    available: true
  },
  {
    _id: ObjectId('6904926266c37ffc0663b113'),
    title: 'Atomic Habits',
    author: 'James Clear',
    genre: 'Self-Help',
    price: 550,
    pages: 320,
    publisher: 'Penguin',
    fuel_type: 'N/A',
    features: [ 'Productivity', 'Motivation' ],
    available: true
  },
  {
    _id: ObjectId('6904926266c37ffc0663b114'),
    title: 'Wings of Fire',
    author: 'A.P.J. Abdul Kalam',
```

```
bookstore_db> db.books.findOne()
{
  _id: ObjectId('6904922c66c37ffc0663b112'),
  title: 'The Alchemist',
  author: 'Paulo Coelho',
  genre: 'Fiction',
  price: 450,
  pages: 208,
  publisher: 'HarperCollins',
  fuel_type: 'N/A',
  features: [ 'Inspirational', 'Adventure' ],
  available: true
}
bookstore_db> |
```

```
bookstore_db> db.books.find({}, {_id:0,title: 1,price: 1})
[
  { title: 'The Alchemist', price: 450 },
  { title: 'Atomic Habits', price: 550 },
  { title: 'Wings of Fire', price: 400 },
  { title: 'Deep Work', price: 600 }
]
bookstore_db>
```

```
bookstore_db> db.books.find({price: {$gt: 500}})
[
  {
    _id: ObjectId('6904926266c37ffc0663b113'),
    title: 'Atomic Habits',
    author: 'James Clear',
    genre: 'Self-Help',
    price: 550,
    pages: 320,
    publisher: 'Penguin',
    fuel_type: 'N/A',
    features: [ 'Productivity', 'Motivation' ],
    available: true
  },
  {
    _id: ObjectId('6904926266c37ffc0663b115'),
    title: 'Deep Work',
    author: 'Cal Newport',
    genre: 'Self-Help',
    price: 600,
    pages: 304,
    publisher: 'Grand Central',
    fuel_type: 'N/A',
    features: [ 'Focus', 'Discipline' ],
    available: true
  }
]
bookstore_db>
```

```
bookstore_db> db.books.updateOne(
...   { title: "The Alchemist" },
...   { $set: { publication: { year: 1988, country: "Brazil" } } }
... )
...
{
  acknowledged: true,
  insertedId: null,
  matchedCount: 1,
  modifiedCount: 1,
  upsertedCount: 0
}
bookstore_db> |
```

```
bookstore_db> db.books.updateOne(
...   { title: "The Alchemist" },
...   { $set: { price: 500 } }
... )
...
{
  acknowledged: true,
  insertedId: null,
  matchedCount: 1,
  modifiedCount: 1,
  upsertedCount: 0
}
bookstore_db>
```

```
bookstore_db> db.books.updateOne(
...   { title: "Atomic Habits" },
...   { $push: { features: "Habit Tracking" } }
... )
...
{
  acknowledged: true,
  insertedId: null,
  matchedCount: 1,
  modifiedCount: 1,
  upsertedCount: 0
}
bookstore_db>
```



```
bookstore_db> db.books.updateOne(
...   { title: "Atomic Habits" },
...   { $pull: { features: "Motivation" } }
... )
...
{
  acknowledged: true,
  insertedId: null,
  matchedCount: 1,
  modifiedCount: 1,
  upsertedCount: 0
}
bookstore_db>
```

```
bookstore_db> db.books.updateMany({}, { $set: { language: "English" } })
{
  acknowledged: true,
  insertedId: null,
  matchedCount: 4,
  modifiedCount: 4,
  upsertedCount: 0
}
bookstore_db>
```

```
bookstore_db> db.books.updateMany({}, { $push: { features: "Reader Favorite" } })
{
  acknowledged: true,
  insertedId: null,
  matchedCount: 4,
  modifiedCount: 4,
  upsertedCount: 0
}
bookstore_db>
```

```
bookstore_db> db.books.updateOne(
...   { title: "Deep Work" },
...   { $unset: { publisher: "" } }
... )
...
{
  acknowledged: true,
  insertedId: null,
  matchedCount: 1,
  modifiedCount: 1,
  upsertedCount: 0
}
bookstore_db>
```

```
bookstore_db> db.books.deleteOne({ title: "Deep Work" })
{ acknowledged: true, deletedCount: 1 }
bookstore_db>
```

```
bookstore_db> db.books.deleteMany({ price: { $lt: 500 } })
{ acknowledged: true, deletedCount: 1 }
bookstore_db> |
```

```
bookstore_db> db.books.aggregate([
...   {
...     $group: {
...       _id: "$author",
...       total_books: { $sum: 1 }
...     }
...   }
... ])
...
[
  { _id: 'James Clear', total_books: 1 },
  { _id: 'Paulo Coelho', total_books: 1 }
]
bookstore_db> |
bookstore_db> db.books.aggregate([
...   {
...     $group: {
...       _id: "$genre",
...       avg_price: { $avg: "$price" }
...     }
...   }
... ])
...
[
  { _id: 'Fiction', avg_price: 500 },
  { _id: 'Self-Help', avg_price: 550 }
]
bookstore_db> |
```

```
bookstore_db> db.books.aggregate([
...   {
...     $group: {
...       _id: "$available",
...       count: { $sum: 1 }
...     }
...   }
... ])
...
[ { _id: true, count: 2 } ]
bookstore_db> db.books.aggregate([
...   {
...     $group: {
...       _id: "$genre",
...       TotalBooks: { $sum: 1 }
...     }
...   }
... ])
...
[
  { _id: 'Fiction', TotalBooks: 1 },
  { _id: 'Self-Help', TotalBooks: 1 }
]
bookstore_db> |
```