

## EXPERIMENT - 10

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**Branch:** BE-CSE  
**Semester:** 5th  
**28/10/2025**  
**Subject Name:** ADBMS

**UID:** 23BCS10502  
**Section/Group:** KRG\_1-B  
**Date of Performance:**  
**Subject Code:** 23CSP-333

----- INSERT OPERATION -----

insertOne:

```
car_dealership> db.cars.insertOne(  
... {  
...   "maker": "Tata",  
...   "model": "Nexon",  
...   "fuel_type": "Petrol",  
...   "transmission": "Automatic",  
...   "engine": {  
...     "type": "Turbocharged",  
...     "cc": 1199,  
...     "torque": "170 Nm"  
...   },  
...   "features": [  
...     "Touchscreen",  
...     "Reverse Camera",  
...     "Bluetooth Connectivity"  
...   ],  
...   "sunroof": false,  
...   "airbags": 2  
... }  
... }
```

insertMany():

```
car_dealership> db.cars.insertMany(  
... [  
...   {  
...     "maker": "Hyundai",  
...     "model": "Creta",  
...     "fuel_type": "Diesel",  
...     "transmission": "Manual",  
...     "engine": {  
...       "type": "Naturally Aspirated",  
...       "cc": 1493,  
...       "torque": "250 Nm"  
...     }  
...   }  
... ])
```

----- READ OPERATION -----

Find(): gives all data - deprecated

```
car_dealership> db.cars.find()
[
  {
    _id: ObjectId('66b8a525d95b225bbc381167'),
    maker: 'Tata',
    model: 'Nexon',
    fuel_type: 'Petrol',
    transmission: 'Automatic',
    engine: { type: 'Turbocharged', cc: 1199, torque: '170 Nm' },
    features: [ 'Touchscreen', 'Reverse Camera', 'Bluetooth Connectivity' ],
    sunroof: false,
    airbags: 2
  },
  {
    _id: ObjectId('66b8a5b5d95b225bbc381168'),
    maker: 'Hyundai',
    model: 'Creta',
    fuel_type: 'Diesel',
    transmission: 'Manual',
    engine: { type: 'Naturally Aspirated', cc: 1493, torque: '250 Nm' },
    features: [ 'Sunroof', 'Leather Seats', 'Wireless Charging' ],
    sunroof: true,
    airbags: 6
  }
]
```

FindOne(): First found data from the collection.

```
car_dealership> db.cars.findOne()
{
  _id: ObjectId('66b8a525d95b225bbc381167'),
  maker: 'Tata',
  model: 'Nexon',
  fuel_type: 'Petrol',
  transmission: 'Automatic',
  engine: { type: 'Turbocharged', cc: 1199, torque: '170 Nm' },
  features: [ 'Touchscreen', 'Reverse Camera', 'Bluetooth Connectivity' ],
  sunroof: false,
  airbags: 2
}
```

Find(): showing specific columns , 1: true, 0:false

```
car_dealership> db.cars.find({}, {model:1})
[
  { _id: ObjectId('66b8a525d95b225bbc381167'), model: 'Nexon' },
  { _id: ObjectId('66b8a5b5d95b225bbc381168'), model: 'Creta' },
  { _id: ObjectId('66b8a5b5d95b225bbc381169'), model: 'Baleno' },
  { _id: ObjectId('66b8a5b5d95b225bbc38116a'), model: 'XUV500' },
  { _id: ObjectId('66b8a5b5d95b225bbc38116b'), model: 'City' }
]
car_dealership> █
```

Let's say you only want Model column not \_id column, then make \_id as 0

```
car_dealership> db.cars.find({}, {model:1,_id:0})
[
  { model: 'Nexon' },
  { model: 'Creta' },
  { model: 'Baleno' },
  { model: 'XUV500' },
  { model: 'City' }
]
```

```
car_dealership> db.cars.find({}, {model:1,maker:1,_id:0})
[
  { maker: 'Tata', model: 'Nexon' },
  { maker: 'Hyundai', model: 'Creta' },
  { maker: 'Maruti Suzuki', model: 'Baleno' },
  { maker: 'Mahindra', model: 'XUV500' },
  { maker: 'Honda', model: 'City' }
]
```

**Find function with condition:** I want details of cars having fuel type as 'Petrol'.

```
car_dealership> db.cars.find({fuel_type:"Petrol"})
```

Find function for nested document:

```
car_dealership> db.cars.find({"engine.type":"Turbocharged"})
[
  {
    _id: ObjectId('66b8a525d95b225bbc381167'),
    maker: 'Tata',
    model: 'Nexon',
    fuel_type: 'Petrol',
    transmission: 'Automatic',
    engine: { type: 'Turbocharged', cc: 1199, torque: '170 Nm' },
    features: [ 'Touchscreen', 'Reverse Camera', 'Bluetooth Connectivity' ],
    sunroof: false,
    airbags: 2
  },
  {
    _id: ObjectId('66b8a5b5d95b225bbc38116a'),
    maker: 'Mahindra',
    model: 'XUV500',
    fuel_type: 'Diesel',
    transmission: 'Manual',
    engine: { type: 'Turbocharged', cc: 2179, torque: '360 Nm' },
    features: [ 'All-Wheel Drive', 'Navigation System', 'Cruise Control' ],
    sunroof: true,
    airbags: 6
  }
]
```

-----UPDATING THE RECORDS-----

UpdateOne:

```
car_dealership> db.cars.updateOne(  
... {model:"Nexon"},  
... {$set:{color:"Red"}}  
... )  
{  
  acknowledged: true,  
  insertedId: null,  
  matchedCount: 1,  
  modifiedCount: 1,  
  upsertedCount: 0  
}
```

Updating a value inside an array in a document: adding data in features column which is array.

\$push:

```
car_dealership> db.cars.updateOne(  
... {model:"Nexon"},  
... {$push:{features:"Heated Seats"}}  
... )  
{  
  acknowledged: true,  
  insertedId: null,  
  matchedCount: 1,  
  modifiedCount: 1,  
  upsertedCount: 0  
}
```

\$pull:

```
car_dealership> db.cars.updateOne( { model: "Nexon" }, { $pull: { features: "Heated Seats" } } )  
{  
  acknowledged: true,  
  insertedId: null,  
  matchedCount: 1,  
  modifiedCount: 1,  
  upsertedCount: 0  
}
```

#### -----UPDATE MANY-----

UpdateMany will do this for every record present inside the collection, while updateOne will only do this for the first matched record only.

```
car_dealership> db.cars.updateMany( { fuel_type: "Diesel" }, { $set: { alloys: "yes" } } )  
{  
  acknowledged: true,  
  insertedId: null,  
  matchedCount: 2,  
  modifiedCount: 1,  
  upsertedCount: 0  
}
```

```
car_dealership> db.cars.updateOne(  
... {model:"Creta"},  
... {$set:{"engine.torque":"270 Nm"}}  
... )  
{  
  acknowledged: true,  
  insertedId: null,  
  matchedCount: 1,  
  modifiedCount: 1,  
  upsertedCount: 0  
}
```

```
db.cars.updateOne(  
  { model: "Nexon" }, // Filter to find the specific document  
  { $push: { features: "Heated Steering Wheel" } }  
);
```

```
db.cars.updateOne(  
  { model: "Nexon" }, // Filter to find the specific document  
  { $pull: { features: "Bluetooth Connectivity" } } // Remove the feature  
);
```

-----Updating multiple values inside an array in a document-----

```
car_dealership> db.cars.updateOne(  
|... {model:"Nexon"},  
|... {$push:{features:{$each:["Wireless charging", "Voice Control"]}}}  
|... )  
{  
  acknowledged: true,  
  insertedId: null,  
  matchedCount: 1,  
  modifiedCount: 1,  
  upsertedCount: 0  
}
```

Removing a field by \$unset:

```
car_dealership> db.cars.updateOne( { model: "Nexon" }, { $unset: { color: "" } } )  
{  
  acknowledged: true,  
  insertedId: null,  
  matchedCount: 1,  
  modifiedCount: 1,  
  upsertedCount: 0  
}
```

--Adding one extra column colors to all the documents in one go.

```
car_dealership> db.cars.updateMany( {}, { $set: {color:"Blue"} } )  
{  
  acknowledged: true,  
  insertedId: null,  
  matchedCount: 4,  
  modifiedCount: 4,  
  upsertedCount: 0  
}
```

\$Upsert: If a document matching your filter exists → **update it**,  
If no document matches → **insert a new document = upsert**

```
car_dealership> db.cars.updateMany(  
... {model:"Venue"},  
... {$set:{Maker:"Hyundai"}},  
... {upsert:true}  
... )  
{  
  acknowledged: true,  
  insertedId: ObjectId('66d6dc4dc1b5e4adce90fd72'),  
  matchedCount: 0,  
  modifiedCount: 0,  
  upsertedCount: 1  
}
```

#### -----DELETE OPERATION-----

DeleteOne(): will delete the first matching record from the document.

```
car_dealership> db.cars.deleteOne({fuel_type:"Petrol"})  
{ acknowledged: true, deletedCount: 1 }  
car_dealership>
```

DeleteMany(): db.cars.deleteMany({ fuel\_type: "Petrol" }) To  
delete all data from a collection: db.cars.deleteMany({ })

#### -----GROUPING IN MONGO DB-----

```
car_dealership> db.cars.aggregate([  
...   {$group:{_id:"$maker"}},  
... ])  
[  
  { _id: 'Hyundai' },  
  { _id: 'Mahindra' },  
  { _id: 'Maruti Suzuki' },  
  { _id: 'Honda' },  
  { _id: 'Tata' }  
]
```

Find number of cars for each specific brand: \$sum

```
car_dealership> db.cars.aggregate([
...     {$group:{
...         _id:"$maker",
...         TotalCars: {$sum:1}
...     }}
... ])
[
{ _id: 'Mahindra', TotalCars: 1 },
{ _id: 'Hyundai', TotalCars: 4 },
{ _id: 'Maruti Suzuki', TotalCars: 3 },
{ _id: 'Honda', TotalCars: 3 },
{ _id: 'Tata', TotalCars: 3 }
]
```

When you write \$sum: 1, you're telling MongoDB:

“Add 1 for each document in this group.”

Eg:

```
{ maker: "Hyundai" }

{ maker: "Hyundai" }

{ maker: "Tata" }
```

Hyundai →  $(1 + 1) = 2$

Tata →  $(1) = 1$

Find the number of cars based on different fuel type:

```
car_dealership> db.cars.aggregate([
...     {$group:{
...         _id:"$fuel_type",
...         TotalCars: {$sum:1}
...     }}
... ])
[
{ _id: 'Electric', TotalCars: 2 },
{ _id: 'Petrol', TotalCars: 6 },
{ _id: 'Diesel', TotalCars: 4 },
{ _id: 'CNG', TotalCars: 2 }
]
```

```
db.collection.aggregate([
  {
    $group: {
      _id: "$category",
      totalAmount: { $sum: "$amount" },
      averageAmount: { $avg: "$amount" },
      minAmount: { $min: "$amount" },
      maxAmount: { $max: "$amount" },
      amountsList: { $push: "$amount" },
      uniqueAmounts: { $addToSet: "$amount" }
    }
  }
])
```

## **Standardization Across Platforms**

- SQL syntax is standardized (ANSI SQL), making it portable across systems like MySQL, PostgreSQL, Oracle, etc.

## **Easier Data Analysis and Reporting**

- SQL databases integrate seamlessly with BI tools, analytics, and reporting systems.
- Excellent for OLAP and data warehousing.