

ASSIGNMENT NO 10

31330

PROBLEM STATEMENT:

MongoDB Aggregation and Indexing: Design and Develop MongoDB Queries using aggregation and indexing with suitable examples using MongoDB

IMPLEMENTATION

```
31330> db.createCollection("Products");
{ ok: 1 }
31330>
31330> db.Products.insertMany([
...   {
...     name: "Laptop",
...     category: "Electronics",
...     price: 80000,
...     attribute: { color: "white", weight: "2pounds" },
...     features: ["16GB RAM", "Intel core"],
...     reviews: [
...       { user: "amit", rating: 9 },
...       { user: "sumit", rating: 8 },
...     ],
...   },
...   {
...     name: "Smartphone",
...     category: "Electronics",
...     price: 56000,
...     attributes: { color: "blue", weight: "200g" },
...     features: ["128GB memory", "Google assistance"],
...     reviews: [
...       { user: "riya", rating: 7 },
...       { user: "rhea", rating: 9 },
...     ],
...   },
...   {
...     name: "T-shirt",
...     category: "Clothing",
...     price: 800,
...     attributes: { color: "black", weight: "200g" },
...     features: ["100% cotton", "slim fit"],
...     reviews: [
...       { user: "amit", rating: 9 },
...       { user: "sumit", rating: 8 },
...     ],
...   },
...   {
...     name: "Shoes",
...     category: "Footwear",
...     price: 3000,
...     attributes: { color: "black", weight: "500g" },
...   },
... ],
price: 2000,
attributes: { color: "blue", weight: "300g" },
features: ["100% cotton", "slim fit"],
reviews: [
  { user: "riya", rating: 7 },
  { user: "rhea", rating: 9 },
],
},
{
name: "Shoes",
category: "Footwear",
price: 3000,
attributes: { color: "black", weight: "500g" },
}
```

```

features: ["100% leather", "slim fit"],
reviews: [
  { user: "amit", rating: 9 },
  { user: "sumit", rating: 8 },
],
},
{
  name: "Sneakers",
  category: "Footwear",
  price: 2000,
  attributes: { color: "white", weight: "300g" },
  features: ["100% leather", "slim fit"],
  reviews: [
    { user: "riya", rating: 7 },
    { user: "rhea", rating: 9 },
  ],
},
{
  name: "Headphones",
  category: "Electronics",
  price: 2000,
... },
... {
...   name: "Jeans",
...   category: "Clothing",
...   price: 2000,
...   attributes: { color: "blue", weight: "300g" },
...   features: ["100% cotton", "slim fit"],
...   reviews: [
...     { user: "riya", rating: 7 },
...     { user: "rhea", rating: 9 },
...   ],
... },
... {
...   name: "Shoes",
...   category: "Footwear",
...   price: 3000,
...   attributes: { color: "black", weight: "500g" },
...   features: ["100% leather", "slim fit"],
...   reviews: [
...     { user: "amit", rating: 9 },
...     { user: "sumit", rating: 8 },
...   ],
... },
... {
...   name: "Sneakers",
...   category: "Footwear",
...   price: 2000,
...   attributes: { color: "white", weight: "300g" },
...   features: ["100% leather", "slim fit"],
...   reviews: [
...     { user: "riya", rating: 7 },
...     { user: "rhea", rating: 9 },
...   ],
... },
... {
...   name: "Headphones",
...   category: "Electronics",
...   price: 2000,
...   attributes: { color: "black", weight: "300g" },
...   features: ["100% leather", "slim fit"],
...   reviews: [

```

```

...     { user: "amit", rating: 9 },
...     { user: "sumit", rating: 8 },
... ],
... },
... {
...     name: "Earphones",
...     category: "Electronics",
...     price: 2000,
...     attributes: { color: "white", weight: "300g" },
...     features: ["100% leather", "slim fit"],
...     reviews: [
...         { user: "riya", rating: 7 },
...         { user: "rhea", rating: 9 },
...     ],
... },
... ]);
{
  acknowledged: true,
  insertedIds: {
    '0': ObjectId('670734913d564f69f6442ef6'),
    '1': ObjectId('670734913d564f69f6442ef7'),
    '2': ObjectId('670734913d564f69f6442ef8'),
    '3': ObjectId('670734913d564f69f6442ef9'),
    '4': ObjectId('670734913d564f69f6442efa'),
    '5': ObjectId('670734913d564f69f6442efb'),
    '6': ObjectId('670734913d564f69f6442efc'),
    '7': ObjectId('670734913d564f69f6442efd')
  }
}
31330>
31330> db.Products.insertOne({
...   name: "Bookshelf",
...   category: "Furniture",
...   price: 25000,
...   attributes: { color: "black", weight: "5kgs" },
...   features: ["12 small shelves", "2 drawers"],
...   reviews: [
...     { user: "Ruchi", rating: 10 },
...     { user: "Aarti", rating: 8 },
...   ],
... });
{
  acknowledged: true,
  insertedId: ObjectId('6707349c3d564f69f6442efe')
}
31330>
31330> db.Products.aggregate([
...   { $group: { _id: "$category", sum: { $sum: "$price" } } },
... ]);
[
  { _id: 'Clothing', sum: 2800 },
  { _id: 'Footwear', sum: 5000 },
  { _id: 'Electronics', sum: 140000 },
  { _id: 'Furniture', sum: 25000 }
]
31330>
31330> db.Products.aggregate([{$match: { price: { $lt: 25000 } } }]);
[
  {
    _id: ObjectId('670734913d564f69f6442ef8'),
    name: 'T-shirt',
    category: 'Clothing',

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    price: 800,
    attributes: { color: 'black', weight: '200g' },
    features: [ '100% cotton', 'slim fit' ],
    reviews: [ { user: 'amit', rating: 9 }, { user: 'sumit', rating: 8 } ]
  },
  {
    _id: ObjectId('670734913d564f69f6442ef9'),
    name: 'Jeans',
    category: 'Clothing',
    price: 2000,
    attributes: { color: 'blue', weight: '300g' },
    features: [ '100% cotton', 'slim fit' ],
    reviews: [ { user: 'riya', rating: 7 }, { user: 'rhea', rating: 9 } ]
  },
  {
    _id: ObjectId('670734913d564f69f6442efa'),
    name: 'Shoes',
    category: 'Footwear',
    price: 3000,
    attributes: { color: 'black', weight: '500g' },
    features: [ '100% leather', 'slim fit' ],
    reviews: [ { user: 'amit', rating: 9 }, { user: 'sumit', rating: 8 } ]
  },
  {
    _id: ObjectId('670734913d564f69f6442efb'),
    name: 'Sneakers',
    category: 'Footwear',
    price: 2000,
    attributes: { color: 'white', weight: '300g' },
    features: [ '100% leather', 'slim fit' ],
    reviews: [ { user: 'riya', rating: 7 }, { user: 'rhea', rating: 9 } ]
  },
  {
    _id: ObjectId('670734913d564f69f6442efc'),
    name: 'Headphones',
    category: 'Electronics',
    price: 2000,
    attributes: { color: 'black', weight: '300g' },
    features: [ '100% leather', 'slim fit' ],
    reviews: [ { user: 'amit', rating: 9 }, { user: 'sumit', rating: 8 } ]
  },
  {
    _id: ObjectId('670734913d564f69f6442efd'),
    name: 'Earphones',
    category: 'Electronics',
    price: 2000,
    attributes: { color: 'white', weight: '300g' },
    features: [ '100% leather', 'slim fit' ],
    reviews: [ { user: 'riya', rating: 7 }, { user: 'rhea', rating: 9 } ]
  }
]
31330>
31330> db.Products.aggregate([{$skip: 2}]);
[
  {
    _id: ObjectId('670734913d564f69f6442ef8'),
    name: 'T-shirt',
    category: 'Clothing',
    price: 800,
    attributes: { color: 'black', weight: '200g' },
    features: [ '100% cotton', 'slim fit' ],
    reviews: [ { user: 'amit', rating: 9 }, { user: 'sumit', rating: 8 } ]
  }
]

```

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},
{
  _id: ObjectId('670734913d564f69f6442ef9'),
  name: 'Jeans',
  category: 'Clothing',
  price: 2000,
  attributes: { color: 'blue', weight: '300g' },
  features: [ '100% cotton', 'slim fit' ],
  reviews: [ { user: 'riya', rating: 7 }, { user: 'rhea', rating: 9 } ]
},
{
  _id: ObjectId('670734913d564f69f6442efa'),
  name: 'Shoes',
  category: 'Footwear',
  price: 3000,
  attributes: { color: 'black', weight: '500g' },
  features: [ '100% leather', 'slim fit' ],
  reviews: [ { user: 'amit', rating: 9 }, { user: 'sumit', rating: 8 } ]
},
{
  _id: ObjectId('670734913d564f69f6442efb'),
  name: 'Sneakers',
  category: 'Footwear',
  price: 2000,
  attributes: { color: 'white', weight: '300g' },
  features: [ '100% leather', 'slim fit' ],
  reviews: [ { user: 'riya', rating: 7 }, { user: 'rhea', rating: 9 } ]
},
{
  _id: ObjectId('670734913d564f69f6442efc'),
  name: 'Headphones',
  category: 'Electronics',
  price: 2000,
  attributes: { color: 'black', weight: '300g' },
  features: [ '100% leather', 'slim fit' ],
  reviews: [ { user: 'amit', rating: 9 }, { user: 'sumit', rating: 8 } ]
},
{
  _id: ObjectId('670734913d564f69f6442efd'),
  name: 'Earphones',
  category: 'Electronics',
  price: 2000,
  attributes: { color: 'white', weight: '300g' },
  features: [ '100% leather', 'slim fit' ],
  reviews: [ { user: 'riya', rating: 7 }, { user: 'rhea', rating: 9 } ]
},
{
  _id: ObjectId('6707349c3d564f69f6442efe'),
  name: 'Bookshelf',
  category: 'Furniture',
  price: 25000,
  attributes: { color: 'black', weight: '5kgs' },
  features: [ '12 small shelves', '2 drawers' ],
  reviews: [ { user: 'Ruchi', rating: 10 }, { user: 'Aarti', rating: 8 } ]
}
]
31330>
31330>
31330> db.Products.aggregate([
...   { $group: { _id: "$category", avgprice: { $avg: "$price" } } },
... ]);
[

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{ _id: 'Electronics', avgprice: 35000 },
{ _id: 'Furniture', avgprice: 25000 },
{ _id: 'Clothing', avgprice: 1400 },
{ _id: 'Footwear', avgprice: 2500 }
]
31330>
31330> db.Products.aggregate([
... {
...   $project: {
...     _id: 0,
...     name: 1,
...     price: 1,
...     no_of_reviews: { $size: "$reviews" },
...   },
... },
... ]);
[
  { name: 'Laptop', price: 80000, no_of_reviews: 2 },
  { name: 'Smartphone', price: 56000, no_of_reviews: 2 },
  { name: 'T-shirt', price: 800, no_of_reviews: 2 },
  { name: 'Jeans', price: 2000, no_of_reviews: 2 },
  { name: 'Shoes', price: 3000, no_of_reviews: 2 },
  { name: 'Sneakers', price: 2000, no_of_reviews: 2 },
  { name: 'Headphones', price: 2000, no_of_reviews: 2 },
  { name: 'Earphones', price: 2000, no_of_reviews: 2 },
  { name: 'Bookshelf', price: 25000, no_of_reviews: 2 }
]
31330>
31330> db.Products.aggregate([
... { $group: { _id: "$category", maxPrice: { $max: "$price" } } },
... ]);
[
  { _id: 'Clothing', maxPrice: 2000 },
  { _id: 'Footwear', maxPrice: 3000 },
  { _id: 'Electronics', maxPrice: 80000 },
  { _id: 'Furniture', maxPrice: 25000 }
]
31330>
31330> db.Products.createIndex({ name: 1, price: -1 });
name_1_price_-1
31330>
31330> db.Products.find({ name: "Jeans", price: 2000 }).hint("name_1_price_-1");
[
  {
    _id: ObjectId('670734913d564f69f6442ef9'),
    name: 'Jeans',
    category: 'Clothing',
    price: 2000,
    attributes: { color: 'blue', weight: '300g' },
    features: [ '100% cotton', 'slim fit' ],
    reviews: [ { user: 'riya', rating: 7 }, { user: 'rhea', rating: 9 } ]
  }
]
31330>
31330> db.Products.createIndex({ name: 1 });
name_1
31330>
31330>

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----- ORDERS -----

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31330> db.createCollection("orders");

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```
{ ok: 1 }
31330>
31330> db.orders.insertMany([
...   {
...     _id: 0,
...     name: "Pepperoni",
...     size: "small",
...     price: 19,
...     quantity: 10,
...     date: ISODate("2021-03-13T08:14:30Z"),
...   },
...   {
...     _id: 1,
...     name: "Pepperoni",
...     size: "medium",
...     price: 20,
...     quantity: 20,
...     date: ISODate("2021-03-13T09:13:24Z"),
...   },
...   {
...     _id: 2,
...     name: "Pepperoni",
...     size: "large",
...     price: 21,
...     quantity: 30,
...     date: ISODate("2021-03-17T09:22:12Z"),
...   },
...   {
...     _id: 3,
...     name: "Cheese",
...     size: "small",
...     price: 12,
...     quantity: 15,
...     date: ISODate("2021-03-13T11:21:39.736Z"),
...   },
...   {
...     _id: 4,
...     name: "Cheese",
...     size: "medium",
...     price: 13,
...     quantity: 50,
...     date: ISODate("2022-01-12T21:23:13.331Z"),
...   },
...   {
...     _id: 5,
...     name: "Cheese",
...     size: "large",
...     price: 14,
...     quantity: 10,
...     date: ISODate("2022-01-12T05:08:13Z"),
...   },
...   {
...     _id: 6,
...     name: "Vegan",
...     size: "small",
...     price: 17,
...     quantity: 10,
...     date: ISODate("2021-01-13T05:08:13Z"),
...   },
...   {
...     _id: 7,
...     name: "Vegan",
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```

...     size: "medium",
...     price: 18,
...     quantity: 10,
...     date: ISODate("2021-01-13T05:10:13Z"),
...   },
... ]);
{
  acknowledged: true,
  insertedIds: { '0': 0, '1': 1, '2': 2, '3': 3, '4': 4, '5': 5, '6': 6, '7': 7 }
}
31330>
31330> db.orders.aggregate(
...   {
...     $match: {
...       date: {
...         $gte: new ISODate("2020-01-30"),
...         $lt: new ISODate("2022-01-30"),
...       },
...     },
...   },
...   {
...     $group: {
...       _id: { $dateToString: { format: "%Y-%m-%d", date: "$date" } },
...       totalOrderValue: { $sum: { $multiply: ["$price", "$quantity"] } },
...       averageOrderQuantity: { $avg: "$quantity" },
...     },
...   },
...   { $sort: { totalOrderValue: -1 } }
... );
[
  { _id: '2022-01-12', totalOrderValue: 790, averageOrderQuantity: 30 },
  { _id: '2021-03-13', totalOrderValue: 770, averageOrderQuantity: 15 },
  { _id: '2021-03-17', totalOrderValue: 630, averageOrderQuantity: 30 },
  { _id: '2021-01-13', totalOrderValue: 350, averageOrderQuantity: 10 }
]
31330>

```