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DBMSL

Assignment 10

MongoDB Aggregation and Indexing: Implement aggregation and indexing with suitable example using MongoDB.

Queries (with outputs) - AGGREGATE

1. mydb> db.collection1.insertMany([
{
  product: "Product A",
  category: "Category 1",
  sales: 100,
  price: 29.99,
  status: "active"
 },
 {
  product: "Product B",
  category: "Category 2",
  sales: 150,
  price: 19.99,
  status: "active"
 },
 {
  product: "Product C",
  category: "Category 1",
  sales: 80,
  price: 39.99,
  status: "inactive"
 },
 {
  product: "Product D",
  category: "Category 3",
  sales: 200,
  price: 49.99,
  status: "active"
 }
]);

```
{
 acknowledged: true,
 insertedIds: {
   '0': ObjectId('66f0e61031fdddb1ee964033'),
   '1': ObjectId('66f0e61031fdddb1ee964034'),
   '2': ObjectId('66f0e61031fdddb1ee964035'),
   '3': ObjectId('66f0e61031fdddb1ee964036')
 }
}
```

2. mydb> db.collection1.find().pretty();

```
[
  {
    _id: ObjectId('66f0e61031fdddb1ee964033'),
    product: 'Product A',
    category: 'Category 1',
    sales: 100,
    price: 29.99,
    status: 'active'
  },
  {
    _id: ObjectId('66f0e61031fdddb1ee964034'),
    product: 'Product B',
    category: 'Category 2',
    sales: 150,
    price: 19.99,
    status: 'active'
  },
  {
    _id: ObjectId('66f0e61031fdddb1ee964035'),
    product: 'Product C',
    category: 'Category 1',
    sales: 80,
    price: 39.99,
    status: 'inactive'
  },
  {
    _id: ObjectId('66f0e61031fdddb1ee964036'),
    product: 'Product D',
    category: 'Category 3',
    sales: 200,
    price: 49.99,
    status: 'active'
  }
]
```

3. mydb> db.collection1.aggregate([
   {
     $group: {
       _id: "$category",
       totalSales: { $sum: "$sales" },
       productCount: { $count: {} }
     }
   }
 ]);

```
[
  { _id: 'Category 2', totalSales: 150, productCount: 1 },
  { _id: 'Category 1', totalSales: 180, productCount: 2 },
  { _id: 'Category 3', totalSales: 200, productCount: 1 }
]
```

4. db.collection1.aggregate([{$sort:{sales:-1}},{$limit:2}]);

```
[
  {
    _id: ObjectId('66f0e61031fdddb1ee964036'),
    product: 'Product D',
    category: 'Category 3',
    sales: 200,
    price: 49.99,
    status: 'active'
  },
  {
    _id: ObjectId('66f0e61031fdddb1ee964034'),
    product: 'Product B',
    category: 'Category 2',
    sales: 150,
    price: 19.99,
    status: 'active'
  }
]
```

5. mydb> db.collection1.aggregate([{$project:{product:1,category:1,sales:1}}]);

```
mydb> db.collection1.aggregate([{$project:{product:1,category:1,sales:1}}]);
[
  {
    _id: ObjectId('66f0e61031fdddb1ee964033'),
    product: 'Product A',
    category: 'Category 1',
    sales: 100
  },
  {
    _id: ObjectId('66f0e61031fdddb1ee964034'),
    product: 'Product B',
    category: 'Category 2',
    sales: 150
  },
  {
    _id: ObjectId('66f0e61031fdddb1ee964035'),
    product: 'Product C',
    category: 'Category 1',
    sales: 80
  },
  {
    _id: ObjectId('66f0e61031fdddb1ee964036'),
    product: 'Product D',
    category: 'Category 3',
    sales: 200
  }
]
```

6. mydb> db.collection1.aggregate([{$sort:{price:1}}]);

```
mydb> db.collection1.aggregate([{$sort:{price:1}}]);
[
  {
    _id: ObjectId('66f0e61031fdddb1ee964034'),
    product: 'Product B',
    category: 'Category 2',
    sales: 150,
    price: 19.99,
    status: 'active'
  },
  {
    _id: ObjectId('66f0e61031fdddb1ee964033'),
    product: 'Product A',
    category: 'Category 1',
    sales: 100,
    price: 29.99,
    status: 'active'
  },
  {
    _id: ObjectId('66f0e61031fdddb1ee964035'),
    product: 'Product C',
    category: 'Category 1',
    sales: 80,
    price: 39.99,
    status: 'inactive'
  },
  {
    _id: ObjectId('66f0e61031fdddb1ee964036'),
    product: 'Product D',
    category: 'Category 3',
    sales: 200,
    price: 49.99,
    status: 'active'
  }
]
```

7. mydb> db.collection1.aggregate([{$match:{category:"Category 1"}}]);

```
mydb> db.collection1.aggregate([{$match:{category:"Category 1"}}]);
[
  {
    _id: ObjectId('66f0e61031fdddb1ee964033'),
    product: 'Product A',
    category: 'Category 1',
    sales: 100,
    price: 29.99,
    status: 'active'
  },
  {
    _id: ObjectId('66f0e61031fdddb1ee964035'),
    product: 'Product C',
    category: 'Category 1',
    sales: 80,
    price: 39.99,
    status: 'inactive'
  }
]
```

8. mydb> db.collection1.aggregate([{$addFields:{totalprice:{$multiply: ["$sales","$price"]}}}]);

```
mydb> db.collection1.aggregate([{$addFields:{totalprice:{$multiply:["$sales","$price"]}}}]);
[
  {
    _id: ObjectId('66f0e61031fdddb1ee964033'),
    product: 'Product A',
    category: 'Category 1',
    sales: 100,
    price: 29.99,
    status: 'active',
    totalprice: 2999
  },
  {
    _id: ObjectId('66f0e61031fdddb1ee964034'),
    product: 'Product B',
    category: 'Category 2',
    sales: 150,
    price: 19.99,
    status: 'active',
    totalprice: 2998.4999999999995
  },
  {
    _id: ObjectId('66f0e61031fdddb1ee964035'),
    product: 'Product C',
    category: 'Category 1',
    sales: 80,
    price: 39.99,
    status: 'inactive',
    totalprice: 3199.2000000000003
  },
  {
    _id: ObjectId('66f0e61031fdddb1ee964036'),
    product: 'Product D',
    category: 'Category 3',
    sales: 200,
    price: 49.99,
    status: 'active',
    totalprice: 9998
  }
]
```

9. mydb> db.collection1.aggregate([{$count:"totalcount"}]);

```
mydb> db.collection1.aggregate([{$count:"totalcount"}]);
[ { totalcount: 4 } ]
```

10. mydb> db.collection1.insertMany([
```
    {
        product: "Product E",
        category: "Category 1",
        sales: [100, 150],
        price: 29.99,
        status: "active"
    },
    {
        product: "Product F",
        category: "Category 2",
        sales: [200],
        price: 19.99,
        status: "active"
    },
    {
        product: "Product G",
        category: "Category 1",
        sales: [80],
        price: 39.99,
        status: "inactive"
    },
    {
        product: "Product H",
        category: "Category 3",
        sales: [300, 100],
        price: 49.99,
        status: "active"
    }
]);
```

11. mydb> db.collection1.aggregate([{$unwind:"$sales"}]);

```
mydb> db.collection1.aggregate([{$unwind:"$sales"}]);
[
  {
    _id: ObjectId('66f0e61031fdddb1ee964033'),
    product: 'Product A',
    category: 'Category 1',
    sales: 100,
    price: 29.99,
    status: 'active'
  },
  {
    _id: ObjectId('66f0e61031fdddb1ee964034'),
    product: 'Product B',
    category: 'Category 2',
    sales: 150,
    price: 19.99,
    status: 'active'
  },
```

```
  {
    _id: ObjectId('66f0e61031fdddb1ee964035'),
    product: 'Product C',
    category: 'Category 1',
    sales: 80,
    price: 39.99,
    status: 'inactive'
  },
  {
    _id: ObjectId('66f0e61031fdddb1ee964036'),
    product: 'Product D',
    category: 'Category 3',
    sales: 200,
    price: 49.99,
    status: 'active'
  },
  {
    _id: ObjectId('66f0ed1631fdddb1ee964037'),
    product: 'Product E',
    category: 'Category 1',
    sales: 100,
    price: 29.99,
    status: 'active'
  },
  {
    _id: ObjectId('66f0ed1631fdddb1ee964037'),
    product: 'Product E',
    category: 'Category 1',
    sales: 150,
    price: 29.99,
    status: 'active'
  },
  {
    _id: ObjectId('66f0ed1631fdddb1ee964038'),
    product: 'Product F',
    category: 'Category 2',
    sales: 200,
    price: 19.99,
    status: 'active'
  },
  {
    _id: ObjectId('66f0ed1631fdddb1ee964039'),
    product: 'Product G',
    category: 'Category 1',
    sales: 80,
    price: 39.99,
    status: 'inactive'
  },
  {
    _id: ObjectId('66f0ed1631fdddb1ee96403a'),
    product: 'Product H',
    category: 'Category 3',
    sales: 300,
    price: 49.99,
    status: 'active'
  },
  {
    _id: ObjectId('66f0ed1631fdddb1ee96403a'),
    product: 'Product H',
    category: 'Category 3',
    sales: 100,
    price: 49.99,
    status: 'active'
  }
]
```

**12. mydb> db.collection1.mapReduce(function()
emit(this.category,this.sales);},function(key,value){return Array.sum(value);},{query:
{status:"active"},out:"totalsales"});**

```
mydb> db.totalsales.find();
[
  { _id: 'Category 3', value: '300,100200' },
  { _id: 'Category 1', value: '100,150100' },
  { _id: 'Category 2', value: '200150' }
]
```

Queries (with outputs) - INDEX -

1. mydb> db.collection1.createIndex({category:1});

```
mydb> db.collection1.createIndex({category:1});
category_1
```

2. mydb> db.collection1.getIndexes();

```
mydb> db.collection1.getIndexes();
[
  { v: 2, key: { _id: 1 }, name: '_id_' },
  { v: 2, key: { category: 1 }, name: 'category_1' }
]
```

3. mydb> db.collection1.dropIndex("category_1")

```
mydb> db.collection1.dropIndex("category_1")
{ nIndexesWas: 2, ok: 1 }
```