MONGO DB CASE STUDY 1

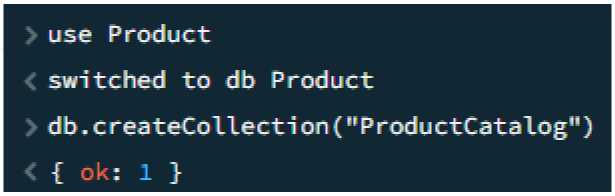
Case Study Overview: MongoDB ProductCatalog

This case study involves a MongoDB collection named `ProductCatalog` in the `casestudy` database. It contains 25 documents with the following fields:

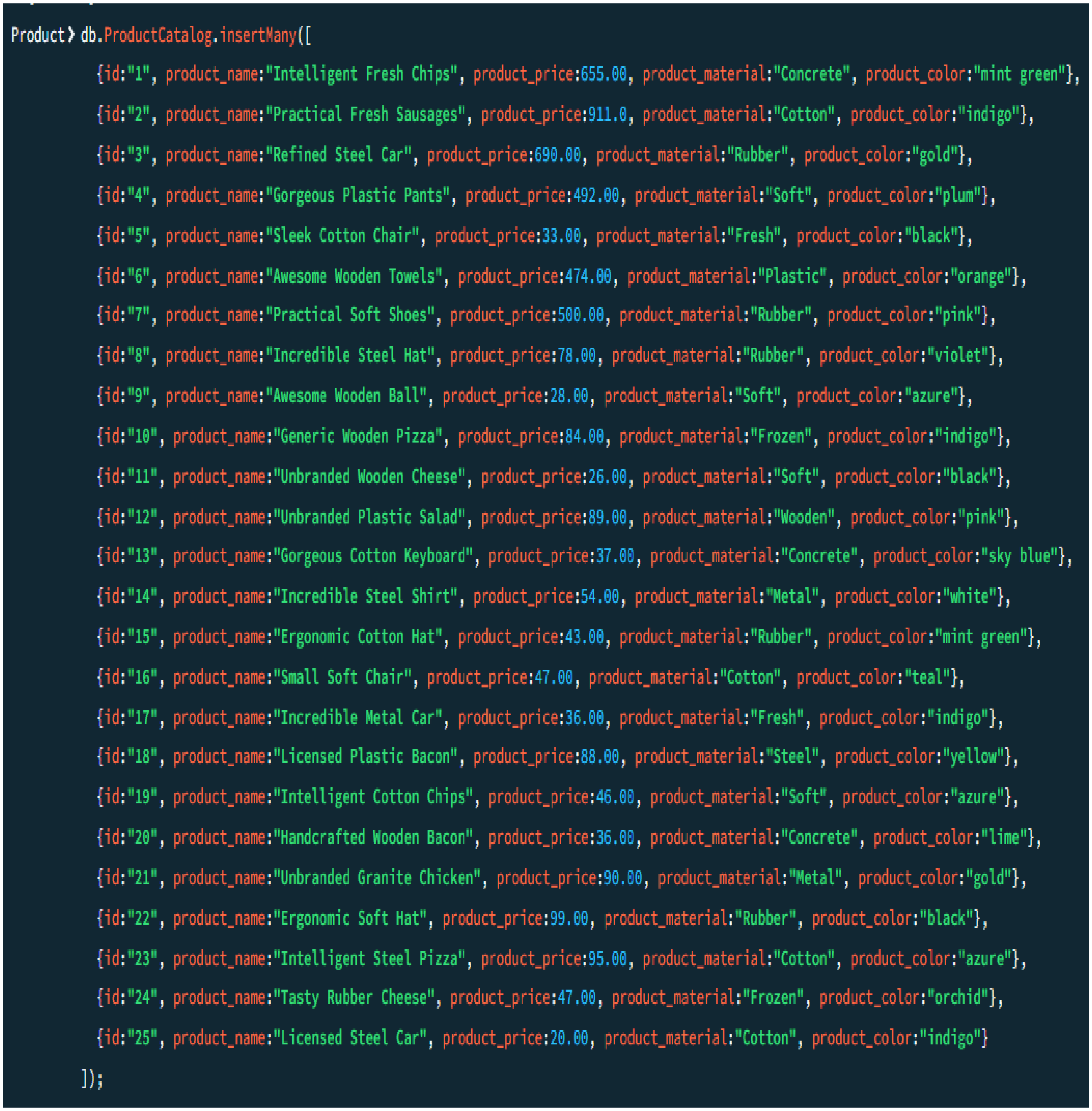
- `id`: Product ID (string)
- `product_name`: Name of the product
- `product_price`: Price (number)
- `product_material`: Material type
- `product_color`: Color

The questions cover:

- Basic queries (e.g., find all products, find by material or color)
- Conditional filters (e.g., price range, specific combinations)
- Projection (show selected fields only)
- Pattern matching (e.g., names starting with "S")
- Duplicate removal and sorting

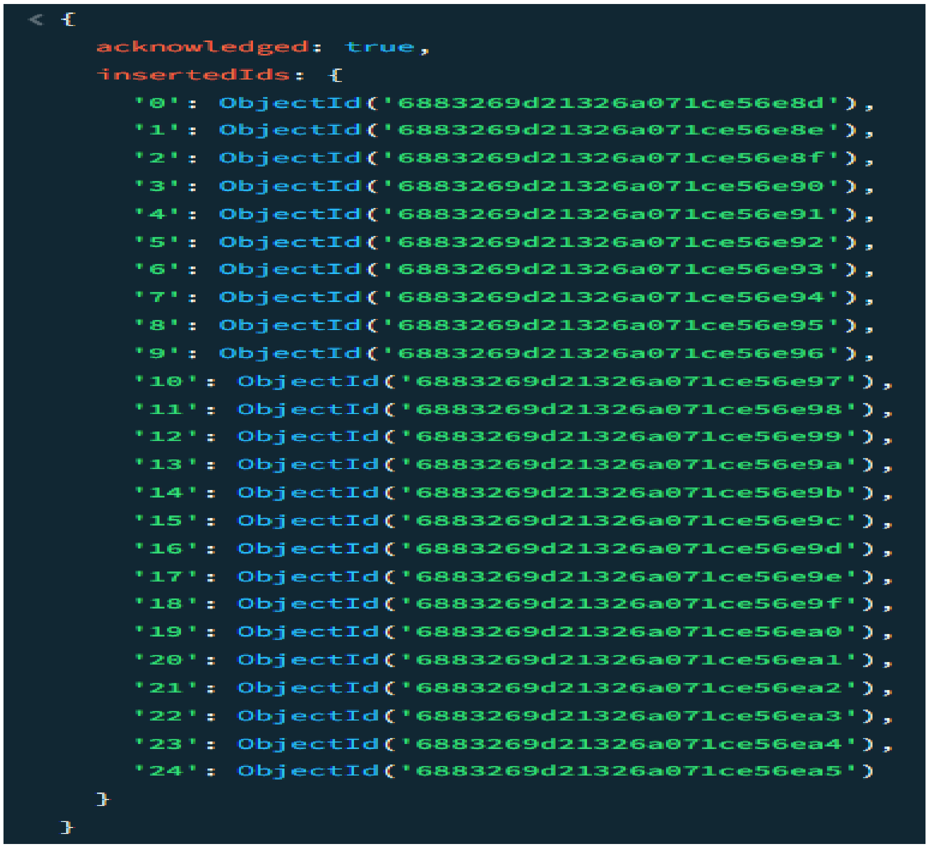


```
> use Product
< switched to db Product
> db.createCollection("ProductCatalog")
< { ok: 1 }
```



```
Product> db.ProductCatalog.insertMany([
            {id:"1", product_name:"Intelligent Fresh Chips", product_price:655.00, product_material:"Concrete", product_color:"mint green"},
            {id:"2", product_name:"Practical Fresh Sausages", product_price:911.0, product_material:"Cotton", product_color:"indigo"},
            {id:"3", product_name:"Refined Steel Car", product_price:690.00, product_material:"Rubber", product_color:"gold"},
            {id:"4", product_name:"Gorgeous Plastic Pants", product_price:492.00, product_material:"Soft", product_color:"plum"},
            {id:"5", product_name:"Sleek Cotton Chair", product_price:33.00, product_material:"Fresh", product_color:"black"},
            {id:"6", product_name:"Awesome Wooden Towels", product_price:474.00, product_material:"Plastic", product_color:"orange"},
            {id:"7", product_name:"Practical Soft Shoes", product_price:500.00, product_material:"Rubber", product_color:"pink"},
            {id:"8", product_name:"Incredible Steel Hat", product_price:78.00, product_material:"Rubber", product_color:"violet"},
            {id:"9", product_name:"Awesome Wooden Ball", product_price:28.00, product_material:"Soft", product_color:"azure"},
            {id:"10", product_name:"Generic Wooden Pizza", product_price:84.00, product_material:"Frozen", product_color:"indigo"},
            {id:"11", product_name:"Unbranded Wooden Cheese", product_price:26.00, product_material:"Soft", product_color:"black"},
            {id:"12", product_name:"Unbranded Plastic Salad", product_price:89.00, product_material:"Wooden", product_color:"pink"},
            {id:"13", product_name:"Gorgeous Cotton Keyboard", product_price:37.00, product_material:"Concrete", product_color:"sky blue"},
            {id:"14", product_name:"Incredible Steel Shirt", product_price:54.00, product_material:"Metal", product_color:"white"},
            {id:"15", product_name:"Ergonomic Cotton Hat", product_price:43.00, product_material:"Rubber", product_color:"mint green"},
            {id:"16", product_name:"Small Soft Chair", product_price:47.00, product_material:"Cotton", product_color:"teal"},
            {id:"17", product_name:"Incredible Metal Car", product_price:36.00, product_material:"Fresh", product_color:"indigo"},
            {id:"18", product_name:"Licensed Plastic Bacon", product_price:88.00, product_material:"Steel", product_color:"yellow"},
            {id:"19", product_name:"Intelligent Cotton Chips", product_price:46.00, product_material:"Soft", product_color:"azure"},
            {id:"20", product_name:"Handcrafted Wooden Bacon", product_price:36.00, product_material:"Concrete", product_color:"lime"},
            {id:"21", product_name:"Unbranded Granite Chicken", product_price:90.00, product_material:"Metal", product_color:"gold"},
            {id:"22", product_name:"Ergonomic Soft Hat", product_price:99.00, product_material:"Rubber", product_color:"black"},
            {id:"23", product_name:"Intelligent Steel Pizza", product_price:95.00, product_material:"Cotton", product_color:"azure"},
            {id:"24", product_name:"Tasty Rubber Cheese", product_price:47.00, product_material:"Frozen", product_color:"orchid"},
            {id:"25", product_name:"Licensed Steel Car", product_price:20.00, product_material:"Cotton", product_color:"indigo"}
        ]);
```

```
// 1. Find all the information about each product
```



```
< {
    acknowledged: true,
    insertedIds: {
      '0': ObjectId('6883269d21326a071ce56e8d'),
      '1': ObjectId('6883269d21326a071ce56e8e'),
      '2': ObjectId('6883269d21326a071ce56e8f'),
      '3': ObjectId('6883269d21326a071ce56e90'),
      '4': ObjectId('6883269d21326a071ce56e91'),
      '5': ObjectId('6883269d21326a071ce56e92'),
      '6': ObjectId('6883269d21326a071ce56e93'),
      '7': ObjectId('6883269d21326a071ce56e94'),
      '8': ObjectId('6883269d21326a071ce56e95'),
      '9': ObjectId('6883269d21326a071ce56e96'),
      '10': ObjectId('6883269d21326a071ce56e97'),
      '11': ObjectId('6883269d21326a071ce56e98'),
      '12': ObjectId('6883269d21326a071ce56e99'),
      '13': ObjectId('6883269d21326a071ce56e9a'),
      '14': ObjectId('6883269d21326a071ce56e9b'),
      '15': ObjectId('6883269d21326a071ce56e9c'),
      '16': ObjectId('6883269d21326a071ce56e9d'),
      '17': ObjectId('6883269d21326a071ce56e9e'),
      '18': ObjectId('6883269d21326a071ce56e9f'),
      '19': ObjectId('6883269d21326a071ce56ea0'),
      '20': ObjectId('6883269d21326a071ce56ea1'),
      '21': ObjectId('6883269d21326a071ce56ea2'),
      '22': ObjectId('6883269d21326a071ce56ea3'),
      '23': ObjectId('6883269d21326a071ce56ea4'),
      '24': ObjectId('6883269d21326a071ce56ea5')
    }
  }
```

1. Find all the information about each product

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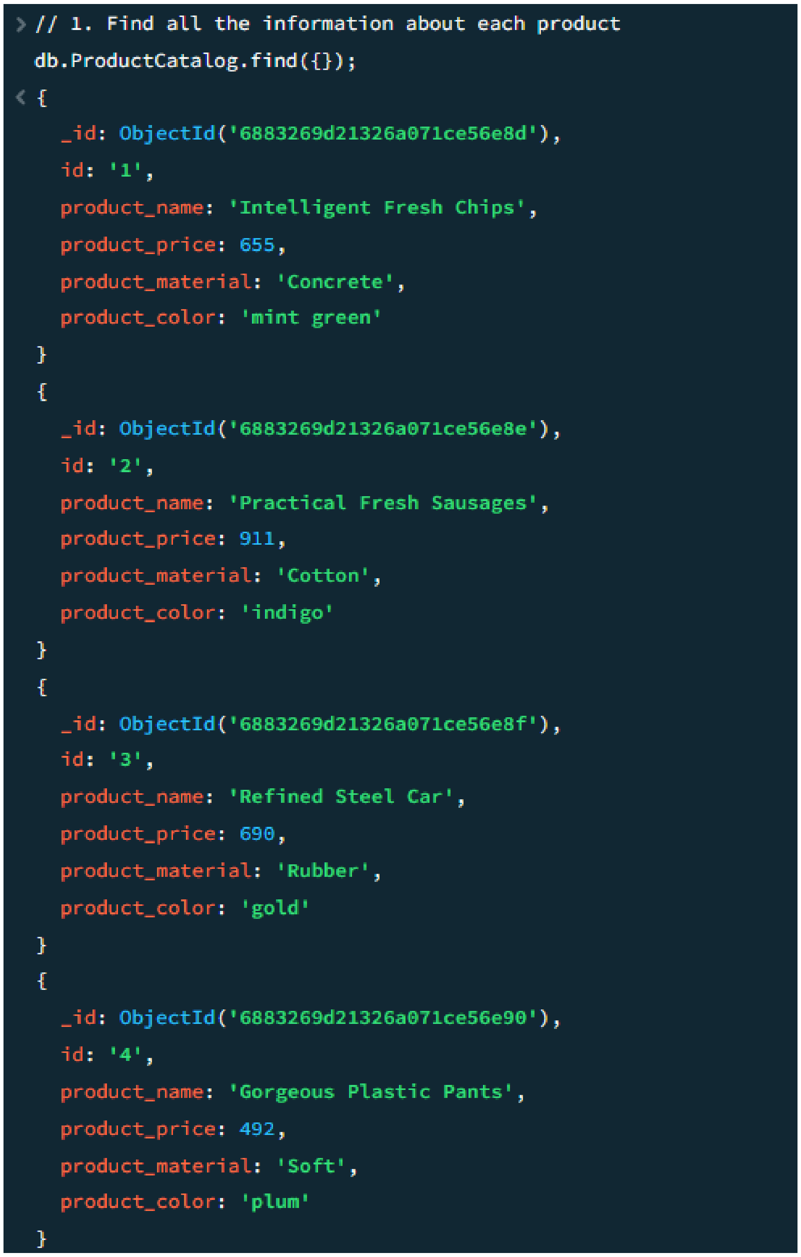
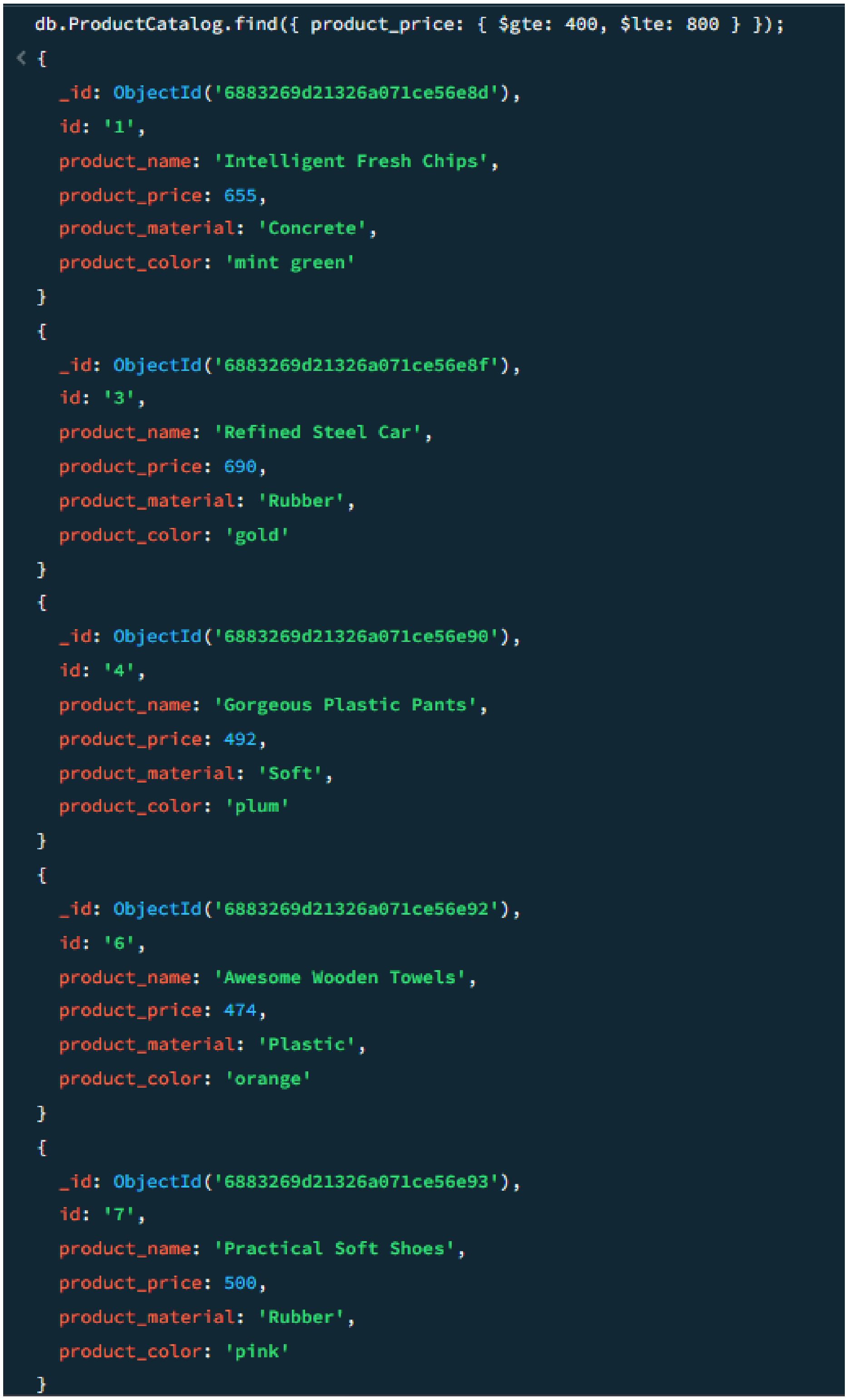


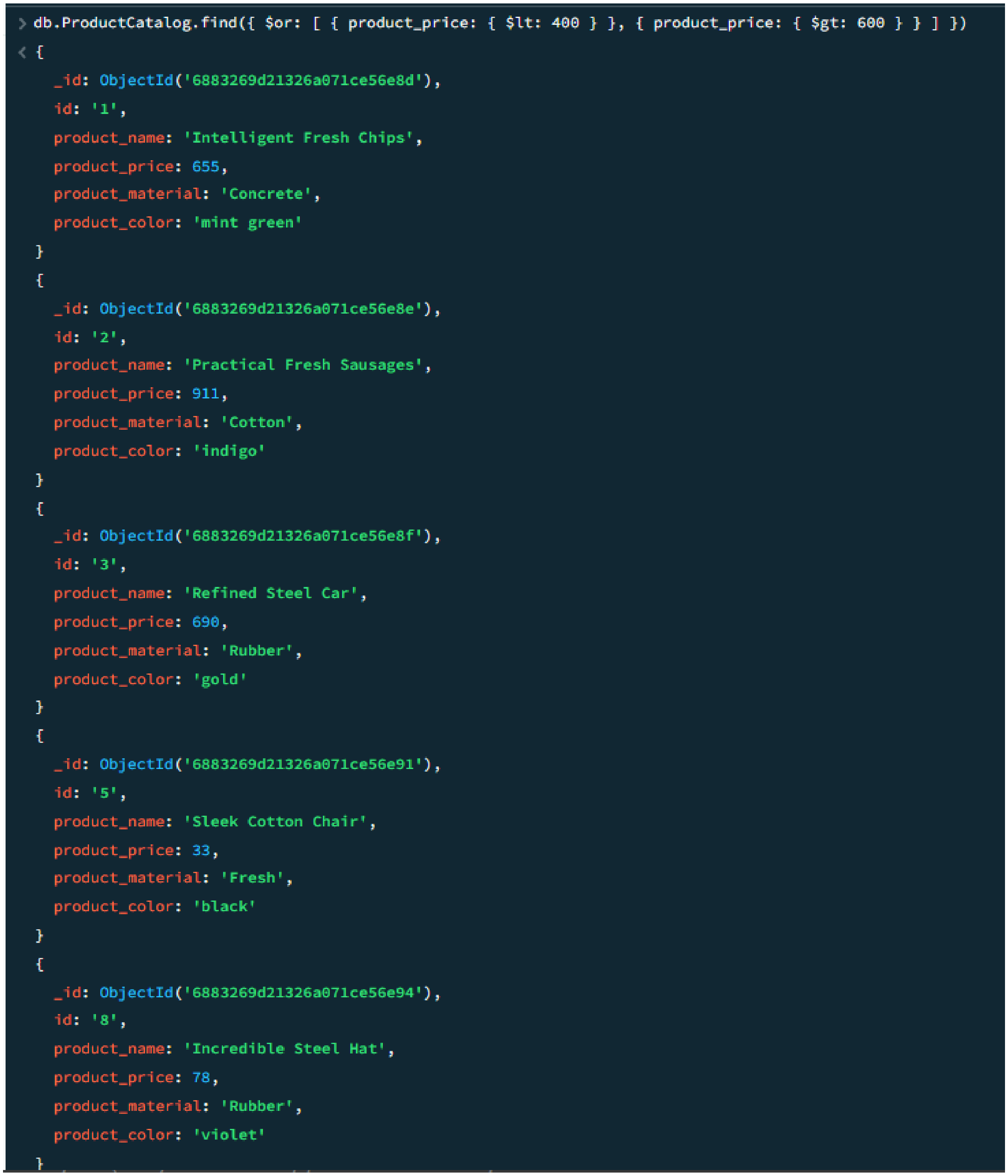
```
> // 1. Find all the information about each product
  db.ProductCatalog.find({});
< {
    _id: ObjectId('6883269d21326a071ce56e8d'),
    id: '1',
    product_name: 'Intelligent Fresh Chips',
    product_price: 655,
    product_material: 'Concrete',
    product_color: 'mint green'
  }
  {
    _id: ObjectId('6883269d21326a071ce56e8e'),
    id: '2',
    product_name: 'Practical Fresh Sausages',
    product_price: 911,
    product_material: 'Cotton',
    product_color: 'indigo'
  }
  {
    _id: ObjectId('6883269d21326a071ce56e8f'),
    id: '3',
    product_name: 'Refined Steel Car',
    product_price: 690,
    product_material: 'Rubber',
    product_color: 'gold'
  }
  {
    _id: ObjectId('6883269d21326a071ce56e90'),
    id: '4',
    product_name: 'Gorgeous Plastic Pants',
    product_price: 492,
    product_material: 'Soft',
    product_color: 'plum'
  }
```

2. Find products with price between 400 and 800



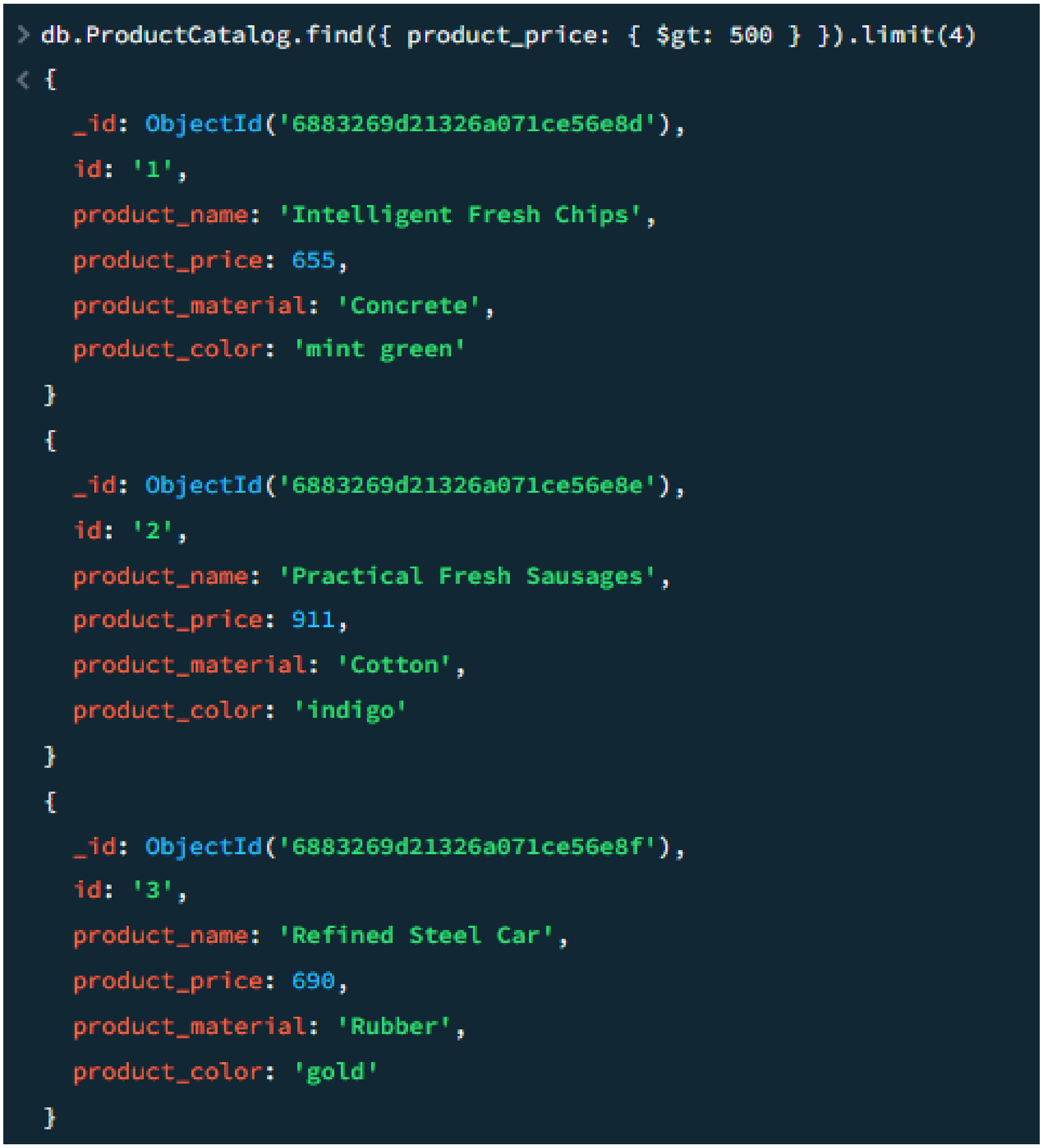
```
  db.ProductCatalog.find({ product_price: { $gte: 400, $lte: 800 } });
< {
    _id: ObjectId('6883269d21326a071ce56e8d'),
    id: '1',
    product_name: 'Intelligent Fresh Chips',
    product_price: 655,
    product_material: 'Concrete',
    product_color: 'mint green'
  }
  {
    _id: ObjectId('6883269d21326a071ce56e8f'),
    id: '3',
    product_name: 'Refined Steel Car',
    product_price: 690,
    product_material: 'Rubber',
    product_color: 'gold'
  }
  {
    _id: ObjectId('6883269d21326a071ce56e90'),
    id: '4',
    product_name: 'Gorgeous Plastic Pants',
    product_price: 492,
    product_material: 'Soft',
    product_color: 'plum'
  }
  {
    _id: ObjectId('6883269d21326a071ce56e92'),
    id: '6',
    product_name: 'Awesome Wooden Towels',
    product_price: 474,
    product_material: 'Plastic',
    product_color: 'orange'
  }
  {
    _id: ObjectId('6883269d21326a071ce56e93'),
    id: '7',
    product_name: 'Practical Soft Shoes',
    product_price: 500,
    product_material: 'Rubber',
    product_color: 'pink'
  }
```

3. Find products with price not between 400 and 600



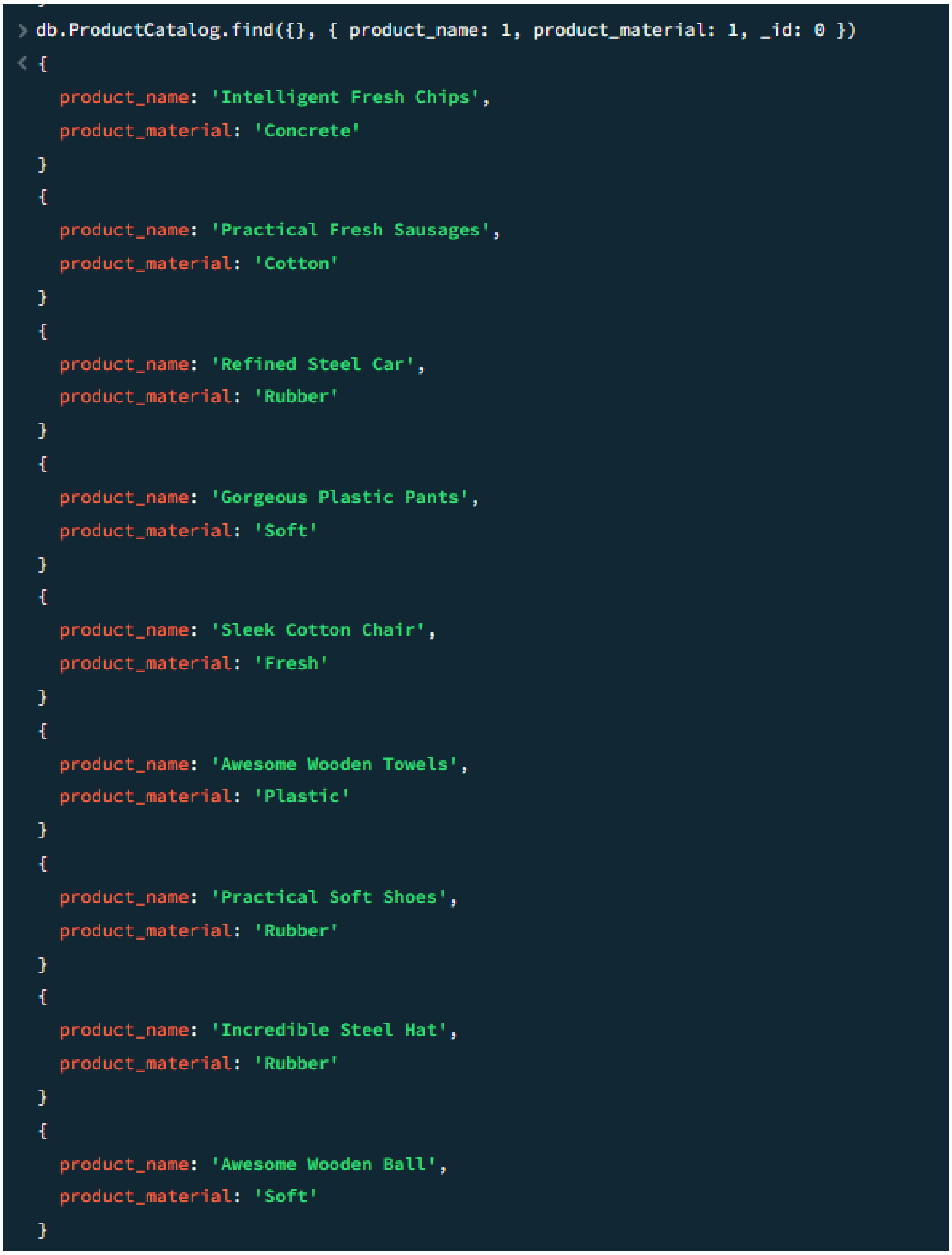
```
> db.ProductCatalog.find({ $or: [ { product_price: { $lt: 400 } }, { product_price: { $gt: 600 } } ] })
< {
    _id: ObjectId('6883269d21326a071ce56e8d'),
    id: '1',
    product_name: 'Intelligent Fresh Chips',
    product_price: 655,
    product_material: 'Concrete',
    product_color: 'mint green'
  }
  {
    _id: ObjectId('6883269d21326a071ce56e8e'),
    id: '2',
    product_name: 'Practical Fresh Sausages',
    product_price: 911,
    product_material: 'Cotton',
    product_color: 'indigo'
  }
  {
    _id: ObjectId('6883269d21326a071ce56e8f'),
    id: '3',
    product_name: 'Refined Steel Car',
    product_price: 690,
    product_material: 'Rubber',
    product_color: 'gold'
  }
  {
    _id: ObjectId('6883269d21326a071ce56e91'),
    id: '5',
    product_name: 'Sleek Cotton Chair',
    product_price: 33,
    product_material: 'Fresh',
    product_color: 'black'
  }
  {
    _id: ObjectId('6883269d21326a071ce56e94'),
    id: '8',
    product_name: 'Incredible Steel Hat',
    product_price: 78,
    product_material: 'Rubber',
    product_color: 'violet'
  }
```

4. List the four products which are greater than 500 in price



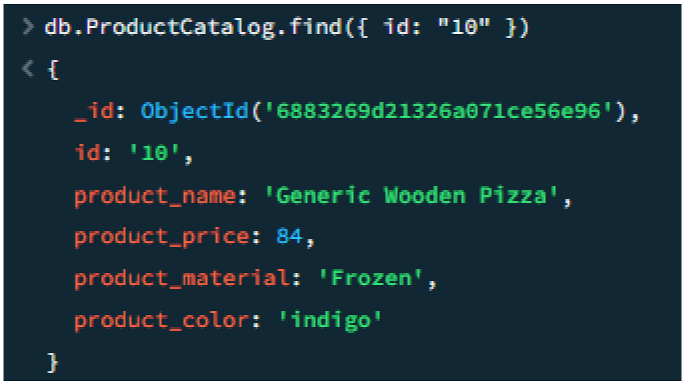
```
> db.ProductCatalog.find({ product_price: { $gt: 500 } }).limit(4)
< {
    _id: ObjectId('6883269d21326a071ce56e8d'),
    id: '1',
    product_name: 'Intelligent Fresh Chips',
    product_price: 655,
    product_material: 'Concrete',
    product_color: 'mint green'
  }
  {
    _id: ObjectId('6883269d21326a071ce56e8e'),
    id: '2',
    product_name: 'Practical Fresh Sausages',
    product_price: 911,
    product_material: 'Cotton',
    product_color: 'indigo'
  }
  {
    _id: ObjectId('6883269d21326a071ce56e8f'),
    id: '3',
    product_name: 'Refined Steel Car',
    product_price: 690,
    product_material: 'Rubber',
    product_color: 'gold'
  }
```

5. **Find the product name and product material of each product**



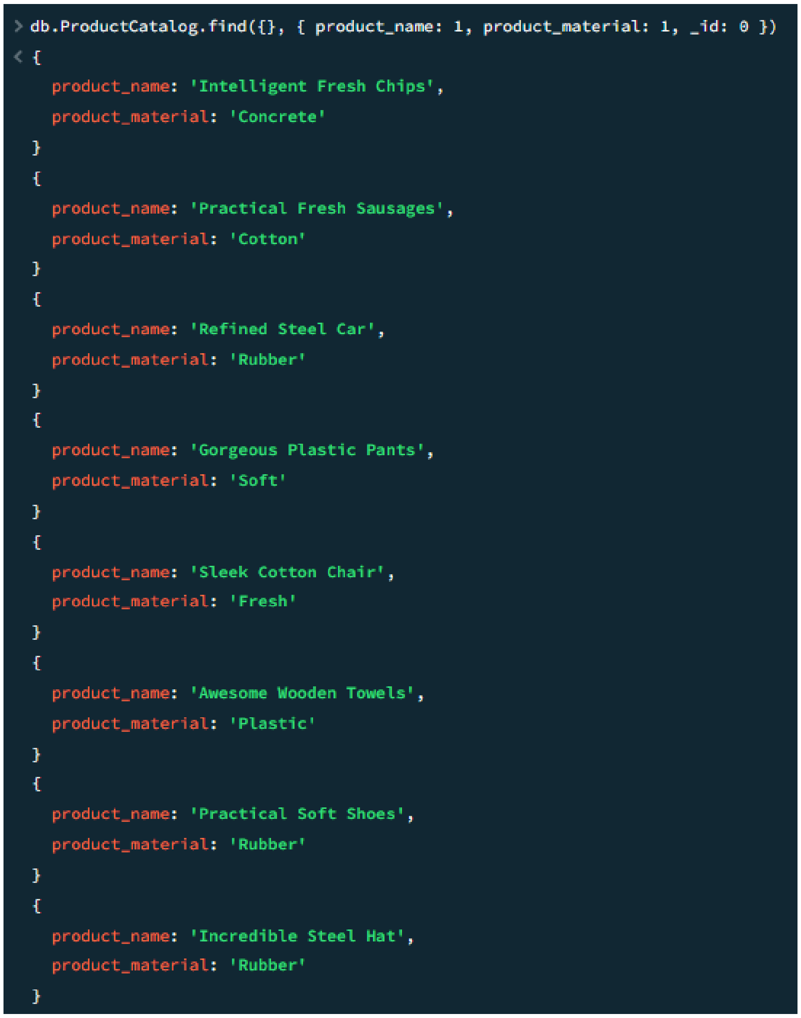
```
> db.ProductCatalog.find({}, { product_name: 1, product_material: 1, _id: 0 })
< {
    product_name: 'Intelligent Fresh Chips',
    product_material: 'Concrete'
  }
  {
    product_name: 'Practical Fresh Sausages',
    product_material: 'Cotton'
  }
  {
    product_name: 'Refined Steel Car',
    product_material: 'Rubber'
  }
  {
    product_name: 'Gorgeous Plastic Pants',
    product_material: 'Soft'
  }
  {
    product_name: 'Sleek Cotton Chair',
    product_material: 'Fresh'
  }
  {
    product_name: 'Awesome Wooden Towels',
    product_material: 'Plastic'
  }
  {
    product_name: 'Practical Soft Shoes',
    product_material: 'Rubber'
  }
  {
    product_name: 'Incredible Steel Hat',
    product_material: 'Rubber'
  }
  {
    product_name: 'Awesome Wooden Ball',
    product_material: 'Soft'
  }
```

6. **Find the product with a row id of 10**



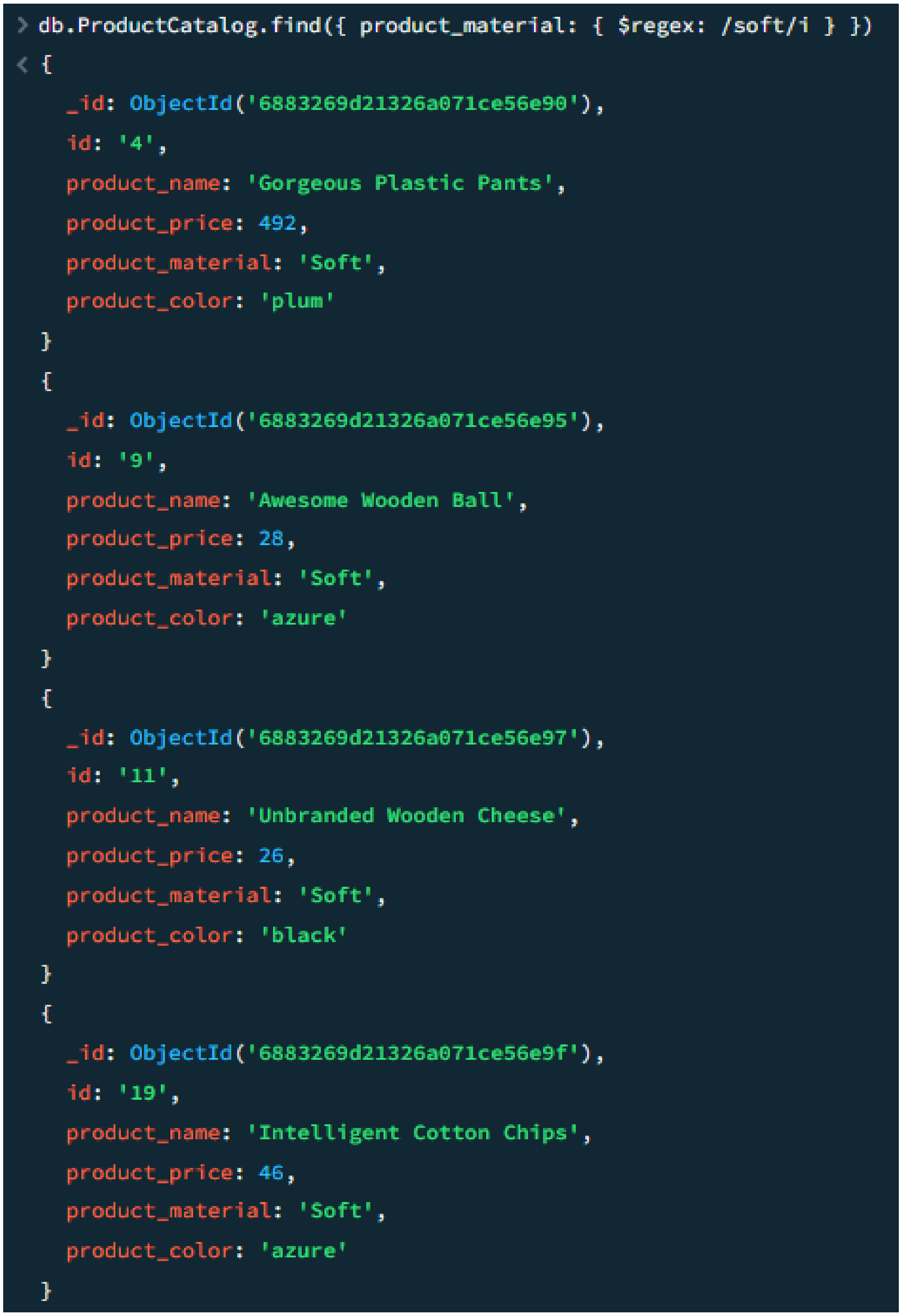
```
> db.ProductCatalog.find({ id: "10" })
< {
    _id: ObjectId('6883269d21326a071ce56e96'),
    id: '10',
    product_name: 'Generic Wooden Pizza',
    product_price: 84,
    product_material: 'Frozen',
    product_color: 'indigo'
  }
```

7. **Find only the product name and product material**



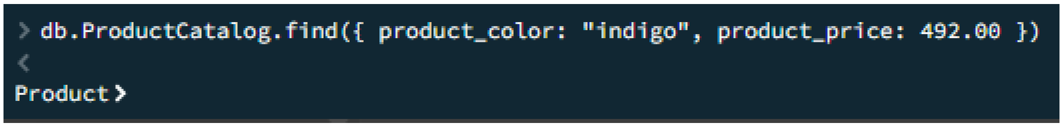
```
> db.ProductCatalog.find({}, { product_name: 1, product_material: 1, _id: 0 })
< {
    product_name: 'Intelligent Fresh Chips',
    product_material: 'Concrete'
  }
  {
    product_name: 'Practical Fresh Sausages',
    product_material: 'Cotton'
  }
  {
    product_name: 'Refined Steel Car',
    product_material: 'Rubber'
  }
  {
    product_name: 'Gorgeous Plastic Pants',
    product_material: 'Soft'
  }
  {
    product_name: 'Sleek Cotton Chair',
    product_material: 'Fresh'
  }
  {
    product_name: 'Awesome Wooden Towels',
    product_material: 'Plastic'
  }
  {
    product_name: 'Practical Soft Shoes',
    product_material: 'Rubber'
  }
  {
    product_name: 'Incredible Steel Hat',
    product_material: 'Rubber'
  }
```

8. **Find all products which contain the value `soft` in product material**



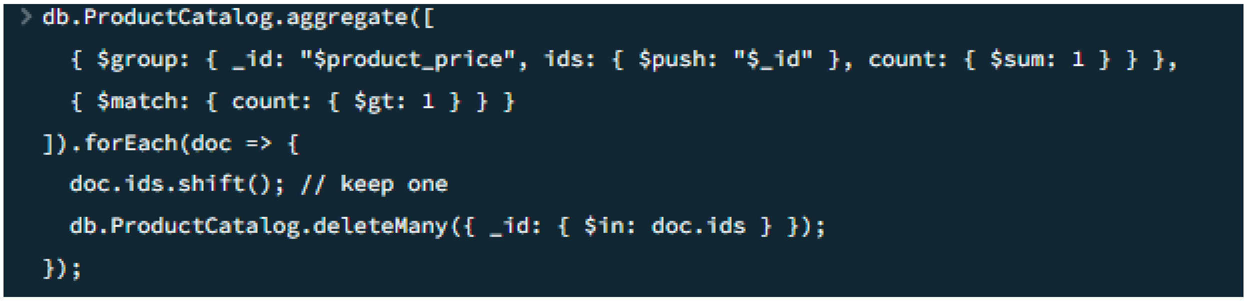
```
> db.ProductCatalog.find({ product_material: { $regex: /soft/i } })
< {
    _id: ObjectId('6883269d21326a071ce56e90'),
    id: '4',
    product_name: 'Gorgeous Plastic Pants',
    product_price: 492,
    product_material: 'Soft',
    product_color: 'plum'
  }
  {
    _id: ObjectId('6883269d21326a071ce56e95'),
    id: '9',
    product_name: 'Awesome Wooden Ball',
    product_price: 28,
    product_material: 'Soft',
    product_color: 'azure'
  }
  {
    _id: ObjectId('6883269d21326a071ce56e97'),
    id: '11',
    product_name: 'Unbranded Wooden Cheese',
    product_price: 26,
    product_material: 'Soft',
    product_color: 'black'
  }
  {
    _id: ObjectId('6883269d21326a071ce56e9f'),
    id: '19',
    product_name: 'Intelligent Cotton Chips',
    product_price: 46,
    product_material: 'Soft',
    product_color: 'azure'
  }
```

9. **Find products which contain product color indigo and product price 492.00**



```
> db.ProductCatalog.find({ product_color: "indigo", product_price: 492.00 })
<
Product >
```

10. **Delete the products which have duplicate product price (keep only one of each)**



```
> db.ProductCatalog.aggregate([
    { $group: { _id: "$product_price", ids: { $push: "$_id" }, count: { $sum: 1 } } },
    { $match: { count: { $gt: 1 } } }
  ]).forEach(doc => {
    doc.ids.shift(); // keep one
    db.ProductCatalog.deleteMany({ _id: { $in: doc.ids } });
  });
```

For queries 9 and 10 , no output i.e
1) there is no product of indigo color of price 492.00
2) there are no duplicate products.