EXPERIMENT 4.3

Aim:

To design and implement a MongoDB data model using nested documents for an e-commerce catalog.

Theory:

MongoDB is a NoSQL document-oriented database that stores data in BSON format. It allows embedding nested documents and arrays within a single collection, making it suitable for real-world applications such as e-commerce catalogs. Instead of managing separate relational tables, MongoDB enables embedding related data, like product variants, directly inside a product document. This makes queries faster and schema design more flexible.

Code:

```
// Create collection and insert sample products
db.products.insertMany([
  {
    name: "T-Shirt", price: 499,
    category: "Clothing",
    variants: [
      { color: "Red", size: "M", stock: 20 },
      { color: "Blue", size: "L", stock: 15 }
    ]
  },
  {
    name: "Sneakers",
    price: 1999,
    category: "Footwear",
    variants: [
      { color: "Black", size: "8", stock: 10 },
      { color: "White", size: "9", stock: 5 }
```

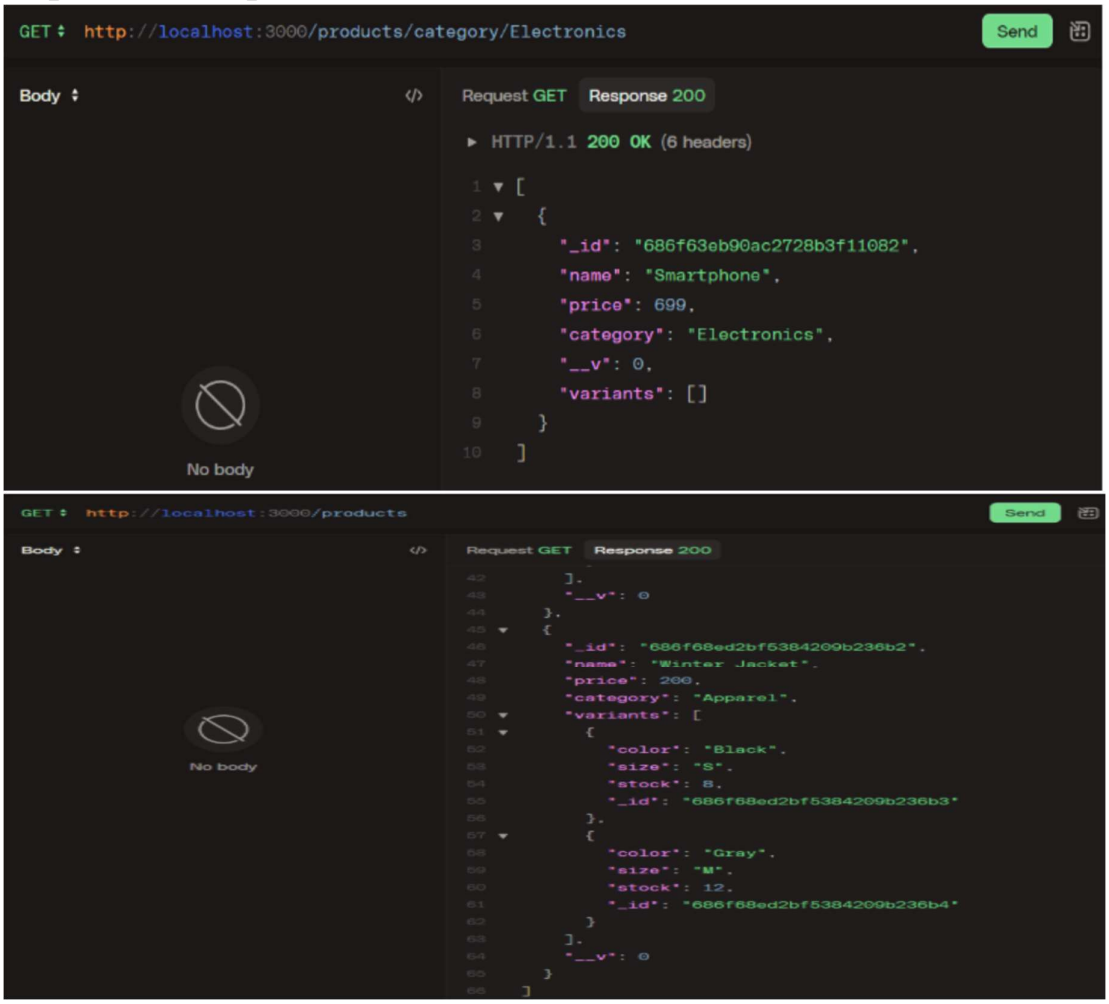
```
    ]
  }
]);

// Retrieve all products
db.products.find();

// Filter products by category
db.products.find({ category: "Clothing" });

// Project specific variant details
db.products.find({}, { name: 1, "variants.color": 1, "variants.size": 1 });
```

Expected Output:



Learning Outcome:

By completing this task, students will be able to: - Understand MongoDB nested document design. - Implement an e-commerce catalog using embedded arrays. - Perform queries with filtering

and

projections. - Gain practical skills for handling hierarchical data in MongoDB.