Test

1.Find all products that have a price greater than ($gt) $100 but less than or equal to ($lte) $500.

Query
```
db.products.find({
  price: { $gt: 100, $lte: 500 }
})
```

Result
```
{
  _id: ObjectId('6559d3e51a6d47b6e9273c55'),
  name: 'Winter Jacket',
  category: 'Apparel',
  price: 180.5,
  stock: 2,
  tags: [
    'Seasonal',
    'Warm'
  ],
  details: {
    color: 'Red',
    brand: 'FashionInc'
  },
  reviews: [
    {
      rating: 4,
      date: 2025-10-01T00:00:00.000Z
    }
  ]
}
```

2. Retrieve products that are in the "Apparel" category OR ($or) have a stock quantity less than 5.

```
db.products.find({
  $or: [
    { category: "Apparel" },
    { stock: { $lt: 5 } }
  ]
})
```

```
{
  _id: ObjectId('6559d3e51a6d47b6e9273c51'),
  name: 'Basic T-Shirt',
  category: 'Apparel',
  price: 25,
  stock: 5,
  tags: [
    'Sale'
  ],
  details: {
    color: 'Blue',
    brand: 'FashionInc'
  },
  reviews: [
    {
      rating: 2,
      date: 2025-09-15T00:00:00.000Z
    },
    {
      rating: 5,
      date: 2025-10-25T00:00:00.000Z
    }
  ]
}
{
  _id: ObjectId('6559d3e51a6d47b6e9273c53'),
  name: 'Adventure Backpack',
  category: 'Accessories',
  price: 60,
  stock: 3,
  tags: [
    'Travel',
```

```
      'Outdoor',
      'Durable'
    ],
    details: {
      color: 'Green',
      brand: 'EconomyBrand'
    },
    reviews: [
      {
        rating: 4,
        date: 2025-08-01T00:00:00.000Z
      }
    ]
  }
  {
    _id: ObjectId('6559d3e51a6d47b6e9273c55'),
    name: 'Winter Jacket',
    category: 'Apparel',
    price: 180.5,
    stock: 2,
    tags: [
      'Seasonal',
      'Warm'
    ],
    details: {
      color: 'Red',
      brand: 'FashionInc'
    },
    reviews: [
      {
        rating: 4,
        date: 2025-10-01T00:00:00.000Z
      }
    ]
  }
```

3. Find documents where the details.color field does not exist ($exists: false).

Query
```
db.products.find({
  "details.color": { $exists: false }
})
```

Result
```
{
  _id: 4,
  nmea: 'SmartPad',
  price: 699,
  releaseDate: 2020-05-14T00:00:00.000Z,
  spec: {
    ram: 8,
    screen: 9.7,
    cpu: 1.66
  },
  color: [
    'white',
    'orange',
    'gold',
    'gray'
  ],
  storage: [
    128,
    256,
    1024
  ]
}
{
  _id: 5,
  nmea: 'SmartPhone',
  price: 599,
  releaseDate: 2022-09-14T00:00:00.000Z,
  spec: {
    ram: 4,
    screen: 5.7,
    cpu: 1.66
  },
  color: [
    'white',
    'orange',
    'gold',
```

```
      'gray'
    ],
    storage: [
      128,
      256
    ]
  }
```

4. Find products whose tags array contains both "New" AND "Premium" (using a comma-separated list in the query document).

Query
db.products.find({
  tags: { $all: ["New", "Premium"] }
})

Result
{
  _id: ObjectId('6559d3e51a6d47b6e9273c50'),
  name: 'Ultimate Laptop Pro',
  category: 'Electronics',
  price: 1250,
  stock: 15,
  tags: [
    'New',
    'Premium',
    'Bestseller'
  ],
  details: {
    color: 'Silver',
    brand: 'TechCo'
  },
  reviews: [
    {
      rating: 5,
      date: 2025-10-20T00:00:00.000Z
    },
    {
      rating: 4,
      date: 2025-11-01T00:00:00.000Z
    }
  ]
}

5. Find products where at least one review has a rating less than 3 AND the review date is before 2025-10-01 (using $elemMatch).

Query
```
db.products.find({
  reviews: {
    $elemMatch: {
      rating: { $lt: 3 },
      date: { $lt: ISODate("2025-10-01T00:00:00.000Z") }
    }
  }
})
```

Result
```
{
  _id: ObjectId('6559d3e51a6d47b6e9273c51'),
  name: 'Basic T-Shirt',
  category: 'Apparel',
  price: 25,
  stock: 5,
  tags: [
    'Sale'
  ],
  details: {
    color: 'Blue',
    brand: 'FashionInc'
  },
  reviews: [
    {
      rating: 2,
      date: 2025-09-15T00:00:00.000Z
    },
    {
      rating: 5,
      date: 2025-10-25T00:00:00.000Z
    }
  ]
}
```

6. Find all products with a price less than $100, and sort ($sort) the results by name in descending order (Z to A).

Query
```
db.products.find({
  price: { $lt: 100 }
})
.sort({ name: -1 })
```

Result
```
{
  _id: ObjectId('6559d3e51a6d47b6e9273c57'),
  name: 'Silver Bracelet',
  category: 'Jewelry',
  price: 49.99,
  stock: 10,
  tags: [
    'Gift',
    'Accessory'
  ],
  details: {
    color: 'Silver',
    brand: 'ShineCo'
  },
  reviews: [
    {
      rating: 5,
      date: 2025-11-01T00:00:00.000Z
    }
  ]
}
{
  _id: ObjectId('6559d3e51a6d47b6e9273c56'),
  name: 'Economy Mouse',
  category: 'Electronics',
  price: 19.99,
  stock: 50,
  tags: [
    'Wired',
    'Budget'
  ],
  details: {
    color: 'Grey',
    brand: 'EconomyBrand'
```

```
    },
    reviews: [
      {
        rating: 3,
        date: 2025-09-01T00:00:00.000Z
      },
      {
        rating: 3,
        date: 2025-09-10T00:00:00.000Z
      }
    ]
  }
  {
    _id: ObjectId('6559d3e51a6d47b6e9273c54'),
    name: 'Classic Novel Set',
    category: 'Books',
    price: 45,
    stock: 20,
    tags: [
      'Fiction',
      'Collection'
    ],
    details: {
      color: 'Mixed',
      brand: 'PublisherX'
    },
    reviews: [
      {
        rating: 5,
        date: 2025-07-01T00:00:00.000Z
      },
      {
        rating: 5,
        date: 2025-07-15T00:00:00.000Z
      },
      {
        rating: 5,
        date: 2025-08-01T00:00:00.000Z
      }
    ]
  }
  {
    _id: ObjectId('6559d3e51a6d47b6e9273c51'),
    name: 'Basic T-Shirt',
```

```
    category: 'Apparel',
    price: 25,
    stock: 5,
    tags: [
      'Sale'
    ],
    details: {
      color: 'Blue',
      brand: 'FashionInc'
    },
    reviews: [
      {
        rating: 2,
        date: 2025-09-15T00:00:00.000Z
      },
      {
        rating: 5,
        date: 2025-10-25T00:00:00.000Z
      }
    ]
  }
  {
    _id: ObjectId('6559d3e51a6d47b6e9273c53'),
    name: 'Adventure Backpack',
    category: 'Accessories',
    price: 60,
    stock: 3,
    tags: [
      'Travel',
      'Outdoor',
      'Durable'
    ],
    details: {
      color: 'Green',
      brand: 'EconomyBrand'
    },
    reviews: [
      {
        rating: 4,
        date: 2025-08-01T00:00:00.000Z
      }
    ]
  }
```

7. Retrieve the 3 cheapest products across the entire collection.

Query
db.products.find()
.sort({ price: 1 })
.limit(3)

Result
```
{
  _id: ObjectId('6559d3e51a6d47b6e9273c56'),
  name: 'Economy Mouse',
  category: 'Electronics',
  price: 19.99,
  stock: 50,
  tags: [
    'Wired',
    'Budget'
  ],
  details: {
    color: 'Grey',
    brand: 'EconomyBrand'
  },
  reviews: [
    {
      rating: 3,
      date: 2025-09-01T00:00:00.000Z
    },
    {
      rating: 3,
      date: 2025-09-10T00:00:00.000Z
    }
  ]
}
{
  _id: ObjectId('6559d3e51a6d47b6e9273c51'),
  name: 'Basic T-Shirt',
  category: 'Apparel',
  price: 25,
  stock: 5,
  tags: [
    'Sale'
  ],
  details: {
    color: 'Blue',
    brand: 'FashionInc'
```

    },
    reviews: [
      {
        rating: 2,
        date: 2025-09-15T00:00:00.000Z
      },
      {
        rating: 5,
        date: 2025-10-25T00:00:00.000Z
      }
    ]
  }
  {
    _id: ObjectId('6559d3e51a6d47b6e9273c54'),
    name: 'Classic Novel Set',
    category: 'Books',
    price: 45,
    stock: 20,
    tags: [
      'Fiction',
      'Collection'
    ],
    details: {
      color: 'Mixed',
      brand: 'PublisherX'
    },
    reviews: [
      {
        rating: 5,
        date: 2025-07-01T00:00:00.000Z
      },
      {
        rating: 5,
        date: 2025-07-15T00:00:00.000Z
      },
      {
        rating: 5,
        date: 2025-08-01T00:00:00.000Z
      }
    ]
  }