

Advanced Product Data Structure & Exercises

Following the structure, a set of real-world inspired JavaScript exercises is provided for data manipulation practice.

Product Data Structure (JavaScript)

```
const products = [
  {
    id: 101,
    name: "Sony LED 40 inch",
    category: "Electronics",
    brand: "Sony",
    sku: "SONY-LED-40",
    description: "40 inch Full HD LED TV with smart features.",
    isActive: true,
    createdAt: "2021-01-15",
    updatedAt: "2022-10-22",
    tags: ["LED", "Smart TV", "HD"],
    supplier: {
      name: "ElectroHouse",
      contact: "support@electrohouse.com"
    },
  },
  variations: [
    {
      id: 1,
      color: "Black",
      price: 50000,
      quantity: 5,
      warranty: "2 years",
      discount: 0,
      isAvailable: true
    },
    {
      id: 2,
      color: "Red",
      price: 50000,
      quantity: 1,
      warranty: "2 years",
```

```
    discount: 5,
    isAvailable: true
  },
  {
    id: 3,
    color: "Silver",
    price: 55000,
    quantity: 8,
    warranty: "3 years",
    discount: 10,
    isAvailable: false
  }
],
reviews: [
  {
    id: 1,
    user: {
      name: "Ahmad",
      email: "ahmad@gmail.com",
      location: "Lahore"
    },
    rating: 4.0,
    title: "Good Product",
    comment: "Very good product for the price.",
    date: "2021-02-06",
    approved: true,
    likes: 2,
    verifiedPurchase: true
  },
  {
    id: 2,
    user: {
      name: "Zubair",
      email: "zubair@yahoo.com",
      location: "Karachi"
    },
    rating: 4.5,
    title: "Awesome",
    comment: "I'm impressed by the quality.",
    date: "2021-02-05",
    approved: false,
    likes: 5,
    verifiedPurchase: false
  }
]
```

```
}  
]  
}  
];
```



Real-World JavaScript Exercises

1. List all product names with their supplier name and contact.
2. Display all available colors for active products.
3. Count the total quantity of all variations that are currently available.
4. List all products that have at least one discounted variation.
5. Calculate and display the effective price (after discount) for each variation.
6. Find the variation with the highest discount across all products.
7. Display the email of users who left approved reviews with more than 3 likes.
8. Count how many reviews are verified purchases.
9. Add a new variation with a new color and stock to a product.
10. Add a new review with location and verified purchase fields.
11. Sort products by latest updatedAt date.
12. Filter out products that are inactive or have no variations in stock.
13. Create a summary for each product: name, totalStock, avgRating, supplierContact.
14. Create a function that returns a report of all suppliers with the count of products they supply.
15. Filter and display products reviewed by users from 'Lahore'.
16. Find the top 3 products by average rating (with at least 2 reviews).
17. Detect and list products where any variation has zero quantity but is marked available (data inconsistency check).
18. List all tags used across products without duplicates.