📚 JavaScript Arrays – Practice Assignments

These assignments are designed for **classroom + lab practice**.
Each assignment includes:

- 🎯 Scenario
- 🧩 Requirements
- 🚀 Expected Array Methods

🧪 Assignment 1 – Online Book Store (Beginner–Intermediate)

🎯 Scenario

You are building a small online bookstore inventory system.

🧩 Data

```
let books = [
  { id: 1, title: "JavaScript Basics", price: 450, stock: 10 },
  { id: 2, title: "React Guide", price: 650, stock: 5 },
  { id: 3, title: "Node.js Mastery", price: 550, stock: 8 },
  { id: 4, title: "CSS Complete", price: 300, stock: 12 }
];
```

📌 Tasks

1. Display all book titles.
2. Find total inventory value.
3. Find books costing above ₹500.
4. Increase price of all books by 5%.
5. Sort books by price (low → high).
6. Remove a book by ID.

7. Check if any book is out of stock.

🛠 Methods to Use

map(), filter(), reduce(), some(), sort(), find()

🏆 Bonus

- Group books by price range.
- Add discount only for books above ₹600.
- Generate invoice string using join().

🚀 Assignment 2 – Student Performance Analyzer (Intermediate)

🎯 Scenario

School wants analytics from student marks.

🎲 Data

```
let students = [
  { name: "Akhil", marks: 85 },
  { name: "Priya", marks: 72 },
  { name: "Ravi", marks: 90 },
  { name: "Meena", marks: 45 },
  { name: "Karan", marks: 30 }
];
```

📌 Tasks

1. Get list of passed students (>= 40).

2. Get distinction students (>= 85).
3. Calculate class average.
4. Find topper.
5. Count failed students.
6. Convert marks to grades (A, B, C, Fail).

🛠 Methods

filter(), reduce(), map(), find(), sort()

🏆 Bonus

- Add rank to each student.
- Remove lowest scorer.
- Create leaderboard sorted by marks.

🧨 Assignment 3 – Shopping Cart Management (Intermediate–Advanced)

🎯 Scenario

Build shopping cart functionality using arrays.

🎲 Data

```
let cart = [
  { id: 1, product: "Laptop", price: 60000, qty: 1 },
  { id: 2, product: "Headphones", price: 2000, qty: 2 },
  { id: 3, product: "Mouse", price: 800, qty: 1 }
];
```

📌 Tasks

1. Calculate total cart value.
2. Increase quantity of a product.
3. Remove product from cart.
4. Apply 10% discount on items above ₹10,000.
5. Sort cart by total item price.
6. Check if any product costs more than ₹50,000.
7. Check if all items are in stock (qty > 0).

🛠 Methods

reduce(), map(), filter(), some(), every(), sort()

🏆 Bonus

- Convert cart into invoice format.
- Find most expensive product.
- Calculate GST (18%) on total.

🚀 Assignment 4 – Employee Payroll System (Advanced)

🎯 Scenario

HR department salary analytics.

🧩 Data

```
let employees = [
 { id:1, name:"Ravi", dept:"IT", salary:70000 },
 { id:2, name:"Anita", dept:"HR", salary:50000 },
```

{ id:3, name:"Karan", dept:"IT", salary:80000 },

{ id:4, name:"Meena", dept:"Finance", salary:60000 }

];

📌 **Tasks**

1. Calculate total salary expense.
2. Find highest and lowest paid employee.
3. Increase IT department salary by 15%.
4. Group employees by department.
5. Calculate department-wise average salary.
6. Sort employees by salary descending.

🛠 **Methods**

reduce(), map(), filter(), sort()

🏆 **Bonus**

- Add tax deduction (10%).
- Find employees earning above average salary.
- Convert employee data into HTML table.

🚀 **Assignment 5 – Data Cleaning & Analytics (Interview Level)**

🎯 **Scenario**

You receive messy data from API.

🧩 **Data**

let numbers = [10, 20, 30, 10, 40, 20, 50, 60, 60];

📌 Tasks

1. Remove duplicates.
2. Find second largest number.
3. Find frequency of each element.
4. Find first non-repeating number.
5. Rotate array by 2 positions.
6. Flatten nested array: [1,2,[3,4,[5]]]
7. Find missing number in [1,2,3,5,6]

🛠 Methods

Set, reduce(), sort(), map(), filter(), slice()
