# Problem Statements : Arrays, Objects, Functions

## 1. **Restaurant Reservation System**

**Problem Statement:** Create a function to manage restaurant reservations. The function should receive a list of reservations and return a summary including the total number of reservations, the number of reservations for each time slot, and a list of reservations for each table.

**Sample Input:**

```
const reservations = [
    { name: "John Doe", time: "18:00", table: 1 },
    { name: "Jane Smith", time: "19:00", table: 2 },
    { name: "Sam Johnson", time: "18:00", table: 1 },
    { name: "Alice Brown", time: "19:00", table: 3 }
];
```

**Sample Output:**

```
{
    totalReservations: 4,
    reservationsByTime: {
        "18:00": 2,
        "19:00": 2
    },
    reservationsByTable: {
        1: [
            { name: "John Doe", time: "18:00" },
            { name: "Sam Johnson", time: "18:00" }
        ],
        2: [
            { name: "Jane Smith", time: "19:00" }
        ],
        3: [
            { name: "Alice Brown", time: "19:00" }
        ]
    }
}
```

## 2. **Flight Booking System**

**Problem Statement:** Create a function that calculates the total revenue from flight bookings. The function should receive a list of bookings and return the total revenue generated.

**Sample Input:**

```
const bookings = [
    { flightNumber: "AA123", price: 250 },
    { flightNumber: "BB456", price: 300 },
    { flightNumber: "AA123", price: 250 },
    { flightNumber: "CC789", price: 500 }
];
```

**Sample Output:**

```
1300
```

## 3. **Gold Investment Tracker**

**Problem Statement:** Develop a function to calculate the total value of gold investments. The function should receive a list of investments with their quantities and prices and return the total value of the investments.

**Sample Input:**

```
const investments = [
    { type: "Gold", quantity: 10, pricePerUnit: 1800 },
    { type: "Gold", quantity: 5, pricePerUnit: 1850 },
    { type: "Silver", quantity: 20, pricePerUnit: 25 }
];
```

**Sample Output:**

```
18750
```

## 4. **Ticket Sales Analysis**

**Problem Statement:** Write a function to analyze ticket sales for an event. The function should calculate the total number of tickets sold and the revenue generated from each ticket type.

**Sample Input:**

```
const sales = [
    { ticketType: "VIP", quantity: 50, price: 200 },
    { ticketType: "Standard", quantity: 150, price: 100 },
    { ticketType: "VIP", quantity: 20, price: 200 }
];
```

**Sample Output:**

```
{
    totalTicketsSold: 220,
    revenueByTicketType: {
        VIP: 14000,
        Standard: 15000
    }
}
```

## 5. **Travel Expense Tracker**

**Problem Statement:** Create a function to track travel expenses. The function should return a breakdown of expenses by category and the total amount spent.

**Sample Input:**

```
const expenses = [
    { category: "Accommodation", amount: 300 },
    { category: "Food", amount: 150 },
    { category: "Transportation", amount: 200 },
    { category: "Food", amount: 100 }
];
```

**Sample Output:**

```
{
    totalAmountSpent: 750,
    expensesByCategory: {
        Accommodation: 300,
        Food: 250,
        Transportation: 200
    }
}
```

## 6. **Investment Portfolio Analyzer**

**Problem Statement:** Design a function that analyzes an investment portfolio, calculating the total value and the proportion of each investment type.

**Sample Input:**

```
const portfolio = [
    { type: "Stocks", value: 5000 },
    { type: "Bonds", value: 2000 },
    { type: "Real Estate", value: 10000 }
];
```

**Sample Output:**

```
{
    totalValue: 17000,
    proportionByType: {
        Stocks: 0.294,
        Bonds: 0.118,
        Real Estate: 0.588
    }
}
```

## 7. **Product Inventory Management**

**Problem Statement:** Write a function to manage a product inventory. The function should update the inventory based on sales and return the updated inventory list.

**Sample Input:**

```
const inventory = [
    { product: "Laptop", quantity: 20 },
    { product: "Phone", quantity: 50 }
];
const sales = [
    { product: "Laptop", quantity: 5 },
    { product: "Phone", quantity: 10 }
];
```

**Sample Output:**

```
[
    { product: "Laptop", quantity: 15 },
    { product: "Phone", quantity: 40 }
]
```

## 8. **Customer Feedback Aggregator**

**Problem Statement:** Create a function that aggregates customer feedback for a product. The function should calculate the average rating and provide a summary of feedback.

**Sample Input:**

```
const feedbacks = [
    { customer: "Alice", rating: 4, comment: "Great product!" },
    { customer: "Bob", rating: 5, comment: "Excellent quality!" },
    { customer: "Charlie", rating: 3, comment: "Good but has some issues." }
];
```

**Sample Output:**

```
{
    averageRating: 4,
    feedbackSummary: {
        totalFeedbacks: 3,
        comments: [
            "Great product!",
            "Excellent quality!",
            "Good but has some issues."
        ]
    }
}
```

## 9. **Customer Order Tracking**

**Problem Statement:** Develop a function to track customer orders. The function should calculate the total value of all orders and provide a summary of orders by customer.

**Sample Input:**

```
const orders = [
    { customer: "John", amount: 150 },
    { customer: "Jane", amount: 200 },
    { customer: "John", amount: 50 },
    { customer: "Alice", amount: 300 }
];
```

**Sample Output:**

```
{
    totalAmount: 700,
    ordersByCustomer: {
        John: 200,
        Jane: 200,
        Alice: 300
    }
}
```

## 10. **Event Scheduling System**

**Problem Statement:** Create a function to manage event scheduling. The function should determine which events overlap in time and return a list of overlapping events.

**Sample Input:**

```
const events = [
    { name: "Meeting A", startTime: "09:00", endTime: "10:00" },
    { name: "Meeting B", startTime: "09:30", endTime: "10:30" },
    { name: "Meeting C", startTime: "11:00", endTime: "12:00" }
];
```

**Sample Output:**

```
[
    { event1: "Meeting A", event2: "Meeting B" }
]
```