Day 6 - Code Java Smart

Sorting a Group of Data

If you want to sort two or more group of data or arrays together (meaning they should be sorted based on one of the arrays while keeping the corresponding values in the other array aligned), you can use Bubble Sort, Selection Sort, or Java's built-in sorting with a custom comparator.

Example :

rollNumbers = {105, 102, 108, 101, 103};

names = {"John", "Alice", "Bob", "David", "Eve"};

Sort both arrays based on rollNumbers while keeping names aligned.

1. ***Bubble Sort (Simple Sorting)***
2. ***Using a Pair Class (Efficient for Large Arrays)***

- ***Approach 1: Bubble Sort (Simple Sorting)***

```
import java.util.Arrays;

class Main {
    public static void main(String[] args) {
        int[] rollNumbers = { 105, 102, 108, 101, 103 };
        String[] names = { "John", "Alice", "Bob", "David", "Eve" };

        // Bubble Sort
        int n = rollNumbers.length;
        for (int i = 0; i < n - 1; i++) {
            for (int j = 0; j < n - i - 1; j++) {
                if (rollNumbers[j] > rollNumbers[j + 1]) {
                    // Swap rollNumbers
                    int temp = rollNumbers[j];
                    rollNumbers[j] = rollNumbers[j + 1];
                    rollNumbers[j + 1] = temp;

                    // Swap corresponding names
                    String tempName = names[j];
                    names[j] = names[j + 1];
                    names[j + 1] = tempName;
                }
            }
        }

        // Printing sorted arrays
        System.out.println("Sorted Roll Numbers: " + Arrays.toString(rollNumbers));
        System.out.println("Sorted Names: " + Arrays.toString(names));
    }
}
```

- ***Approach 2: Using a Pair Class (Efficient for Large Arrays)***

```
import java.util.*;

class Main {
    // Creating an inner class - Packet
    static class Packet {
        int roll;
        String name;

        Packet(int roll, String name) {
            this.roll = roll;
            this.name = name;
        }
    }

    public static void main(String[] args) {
        int[] rollNumbers = { 105, 102, 108, 101, 103 };
        String[] names = { "John", "Alice", "Bob", "David", "Eve" };

        int n = rollNumbers.length; // No of values

        // Creating Array of Objects
        Packet data[] = new Packet[n];

        // Filling Array - data
        for (int i = 0; i < n; i++) {
            data[i] = new Packet(rollNumbers[i], names[i]);
        }

        // Sorting
        Arrays.sort(data, new Comparator<Packet>() {
            public int compare(Packet p1, Packet p2) {
                return p1.roll - p2.roll;
            }
        });

        // Printing sorted data
        System.out.print("\nSorted Roll Numbers: ");
        for (int i = 0; i < n; i++)
            System.out.print(data[i].roll + " ");

        System.out.print("\nSorted Names: ");
        for (int i = 0; i < n; i++)
            System.out.print(data[i].name + " ");
    }
}
```