

Task 2: Unique Elements Identification

Given an array of integers where every element appears twice except for two, write a function that efficiently finds these two non-repeating elements using bitwise XOR operations

```
public class UniqueElementsIdentification {

    public static int[] findNonRepeatingElements(int[] arr) {

        // Find the XOR of all elements in the array
        int xorResult = 0;

        for (int num : arr) {
            xorResult ^= num;
        }

        // Find the rightmost set bit in the XOR result
        int rightmostSetBit = xorResult & -xorResult;

        // Divide the array elements into two groups based on the rightmost set bit
        int group1 = 0;
        int group2 = 0;

        for (int num : arr) {
            if ((num & rightmostSetBit) != 0) {
                group1 ^= num;
            } else {
                group2 ^= num;
            }
        }

        return new int[]{group1, group2};
    }

    public static void main(String[] args) {

        int[] arr = {2, 4, 7, 9, 2, 4};

        int[] result = findNonRepeatingElements(arr);

        System.out.println("Non-repeating elements: " + result[0] + ", " + result[1]);
    }
}
```

```
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6      int xorResult = 0;
7      for (int num : arr) {
8          xorResult ^= num;
9      }
10
11     // Find the rightmost set bit in the XOR result
12     int rightmostSetBit = xorResult & -xorResult;
13
14     // Divide the array elements into two groups based on the rightmost set bit
15     int group1 = 0;
16     int group2 = 0;
17     for (int num : arr) {
18         if ((num & rightmostSetBit) != 0) {
19             group1 ^= num;
20         } else {
21             group2 ^= num;
22         }
23     }
24
25     return new int[]{group1, group2};
26 }
27
28 public static void main(String[] args) {
29     int[] arr = {2, 4, 7, 9, 2, 4};
30     int[] result = findNonRepeatingElements(arr);
31     System.out.println("Non-repeating elements: " + result[0] + ", " + result[1]);
32 }
33 }
34
```

Markers Properties Terminal Console Coverage

<terminated> UniqueElementsIdentification [Java Application] C:\Users\Nikita\p2\pool\plugins\org.eclipse.justj.openjdk.hotspot.jre.full.win32.x86_64_16.0.2

Non-repeating elements: 7, 9