25 JAVA CODING QUESTIONS BASED ON SET, MAP ETC

🔥 **Get ready to master concepts like HashSet, TreeSet, HashMap, LinkedHashMap, and more!**
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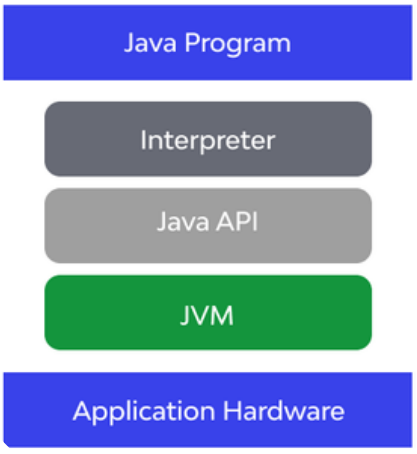

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25 Java Coding Questions based on Set, Map etc

1. Find First Non-Repeating Character in a String using HashMap 2. Find Duplicate Elements in an Array using HashSet
3. Find Intersection of Two Arrays using Set
4. Find Word Frequency in a Sentence using HashMap
5. Check if Two Strings are Anagrams using HashMap
6. Find the First Repeating Character in a String using HashSet
7. Remove Duplicates from a List using HashSet
8. Find Two Numbers that Add Up to Target (Two Sum) using HashMap
9. Check if Array Contains Duplicate using HashSet
10. Group Anagrams from an Array of Strings using HashMap
11. Find Occurrence of Each Word in a String using HashMap
12. Count Occurrences of Each Character in a String
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17. Find Two Numbers that Sum to a Target (Two Sum Problem)
18. Check if Two Strings are Anagrams
19. Check if a String is a Palindrome
20. Remove Consecutive Duplicate Words from a Sentence
21. Find the First Repeating Character in a String
22. Find the Missing Number in an Array
23. Find the Longest Word in a Sentence
24. Find Duplicate Elements in an Array
25. Find the Most Frequent Element in an Array

1. Find First Non-Repeating Character in a String using HashMap

```java
import java.util.LinkedHashMap;
import java.util.Map;

public class FirstUniqueChar {
    public static char firstUniqueChar(String str) {
        Map<Character, Integer> map = new LinkedHashMap<>();
        for (char ch : str.toCharArray()) {
            map.put(ch, map.getOrDefault(ch, 0) + 1);
        }
        for (Map.Entry<Character, Integer> entry : map.entrySet()) {
            if (entry.getValue() == 1) return entry.getKey();
        }
        return '_';
    }

    public static void main(String[] args) {
        System.out.println(firstUniqueChar("swiss")); // Output: 'w'
    }
}
```

---

2. Find Duplicate Elements in an Array using HashSet

```java
import java.util.HashSet;
import java.util.Set;

public class FindDuplicates {
    public static void findDuplicates(int[] arr) {
        Set<Integer> seen = new HashSet<>();
        for (int num : arr) {
            if (!seen.add(num)) {
                System.out.println("Duplicate: " + num);
            }
        }
    }

    public static void main(String[] args) {
        findDuplicates(new int[]{1, 2, 3, 4, 2, 5, 6, 3});
    }
}
```

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3. Find Intersection of Two Arrays using Set

```java
import java.util.Arrays;
import java.util.HashSet;
import java.util.Set;

public class ArrayIntersection {
    public static int[] intersection(int[] arr1, int[] arr2) {
        Set<Integer> set1 = new HashSet<>();
        Set<Integer> result = new HashSet<>();
        for (int num : arr1) set1.add(num);
        for (int num : arr2) {
            if (set1.contains(num)) result.add(num);
        }
        return result.stream().mapToInt(Integer::intValue).toArray();
    }

    public static void main(String[] args) {
        System.out.println(Arrays.toString(intersection(new int[]{1, 2, 3, 4}, new int[]{3, 4, 5, 6})));
    }
}
```

---

4. Find Word Frequency in a Sentence using HashMap

```java
import java.util.HashMap;
import java.util.Map;

public class WordFrequency {
    public static void countWords(String sentence) {
        Map<String, Integer> map = new HashMap<>();
        String[] words = sentence.toLowerCase().split("\\s+");
        for (String word : words) {
            map.put(word, map.getOrDefault(word, 0) + 1);
        }
        System.out.println(map);
    }

    public static void main(String[] args) {
        countWords("This is a test and this is only a test");
    }
}
```

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5. Check if Two Strings are Anagrams using HashMap

```java
import java.util.HashMap;
import java.util.Map;

public class AnagramCheck {
    public static boolean isAnagram(String s1, String s2) {
        if (s1.length() != s2.length()) return false;
        Map<Character, Integer> map = new HashMap<>();
        for (char ch : s1.toCharArray()) {
            map.put(ch, map.getOrDefault(ch, 0) + 1);
        }
        for (char ch : s2.toCharArray()) {
            map.put(ch, map.getOrDefault(ch, 0) - 1);
        }
        return map.values().stream().allMatch(count -> count == 0);
    }

    public static void main(String[] args) {
        System.out.println(isAnagram("listen", "silent")); // true
        System.out.println(isAnagram("java", "python")); // false
    }
}
```

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6. Find the First Repeating Character in a String using HashSet

```java
import java.util.HashSet;
import java.util.Set;

public class FirstRepeatingChar {
    public static char firstRepeatingChar(String str) {
        Set<Character> set = new HashSet<>();
        for (char ch : str.toCharArray()) {
            if (!set.add(ch)) return ch;
        }
        return '_';
    }

    public static void main(String[] args) {
        System.out.println(firstRepeatingChar("abcdefa")); // Output: 'a'
    }
}
```

---

7. Remove Duplicates from a List using HashSet

```java
import java.util.ArrayList;
import java.util.HashSet;
import java.util.List;
import java.util.Set;

public class RemoveDuplicates {
    public static List<Integer> removeDuplicates(List<Integer> list) {
        Set<Integer> set = new HashSet<>(list);
        return new ArrayList<>(set);
    }

    public static void main(String[] args) {
        System.out.println(removeDuplicates(List.of(1, 2, 3, 2, 4, 1, 5)));
    }
}
```

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8. Find Two Numbers that Add Up to Target (Two Sum) using HashMap

```java
import java.util.HashMap;
import java.util.Map;

public class TwoSum {
    public static int[] findTwoSum(int[] arr, int target) {
        Map<Integer, Integer> map = new HashMap<>();
        for (int i = 0; i < arr.length; i++) {
            int complement = target - arr[i];
            if (map.containsKey(complement)) {
                return new int[]{map.get(complement), i};
            }
            map.put(arr[i], i);
        }
        return new int[]{-1, -1};
    }

    public static void main(String[] args) {
        int[] result = findTwoSum(new int[]{2, 7, 11, 15}, 9);
        System.out.println(result[0] + ", " + result[1]); // Output: 0, 1
    }
}
```

---

9. Check if Array Contains Duplicate using HashSet

```java
import java.util.HashSet;
import java.util.Set;

public class ContainsDuplicate {
    public static boolean containsDuplicate(int[] arr) {
        Set<Integer> set = new HashSet<>();
        for (int num : arr) {
            if (!set.add(num)) return true;
        }
        return false;
    }

    public static void main(String[] args) {
        System.out.println(containsDuplicate(new int[]{1, 2, 3, 4})); // false
        System.out.println(containsDuplicate(new int[]{1, 2, 3, 3})); // true
    }
}
```

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10. Group Anagrams from an Array of Strings using HashMap

```java
import java.util.*;

public class GroupAnagrams {
    public static List<List<String>> groupAnagrams(String[] words) {
        Map<String, List<String>> map = new HashMap<>();
        for (String word : words) {
            char[] chars = word.toCharArray();
            Arrays.sort(chars);
            String sorted = new String(chars);
            map.computeIfAbsent(sorted, k -> new ArrayList<>()).add(word);
        }
        return new ArrayList<>(map.values());
    }

    public static void main(String[] args) {
        String[] words = {"cat", "dog", "tac", "god", "act"};
        System.out.println(groupAnagrams(words));
    }
}
```

---

11. Find Occurrence of Each Word in a String using HashMap

```java
import java.util.HashMap;
import java.util.Map;

public class WordOccurrence {
    public static void countWordFrequency(String str) {
        String[] words = str.toLowerCase().split("\\s+");
        Map<String, Integer> map = new HashMap<>();
        for (String word : words) {
            map.put(word, map.getOrDefault(word, 0) + 1);
        }
        System.out.println(map);
    }

    public static void main(String[] args) {
        countWordFrequency("This is a test and this is only a test");
    }
}
```

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📌 **Explanation** : Splits the string into words and counts occurrences using `HashMap` .

---

12. Count Occurrences of Each Character in a String

```java
import java.util.HashMap;
import java.util.Map;

public class CharFrequency {
    public static void countCharFrequency(String str) {
        Map<Character, Integer> map = new HashMap<>();
        for (char ch : str.toCharArray()) {
            map.put(ch, map.getOrDefault(ch, 0) + 1);
        }
        System.out.println(map);
    }

    public static void main(String[] args) {
        countCharFrequency("hello world");
    }
}
```

📌 **Explanation** : Iterates through each character and counts its frequency using a `HashMap` .

---

13. Remove Duplicates from an Array using HashSet

```java
import java.util.Arrays;
import java.util.HashSet;
import java.util.Set;

public class RemoveDuplicates {
    public static int[] removeDuplicates(int[] arr) {
        Set<Integer> set = new HashSet<>();
        for (int num : arr) set.add(num);
        return set.stream().mapToInt(Integer::intValue).toArray();
    }

    public static void main(String[] args) {
        System.out.println(Arrays.toString(removeDuplicates(new int[]{1, 2, 3, 2, 4, 1, 5})));
    }
}
```

📌 **Explanation** : Uses a `HashSet`to remove duplicate elements and return unique values.

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14. Find the First Non-Repeating Character in a String

```java
import java.util.LinkedHashMap;
import java.util.Map;

public class FirstNonRepeatingChar {
    public static char firstUniqueChar(String str) {
        Map<Character, Integer> map = new LinkedHashMap<>();
        for (char ch : str.toCharArray()) {
            map.put(ch, map.getOrDefault(ch, 0) + 1);
        }
        for (Map.Entry<Character, Integer> entry : map.entrySet()) {
            if (entry.getValue() == 1) return entry.getKey();
        }
        return '_';
    }

    public static void main(String[] args) {
        System.out.println(firstUniqueChar("swiss")); // Output: 'w'
    }
}
```

📌 **Explanation** : Uses `LinkedHashMap`to maintain insertion order and find the first unique character.

---

15. Find Intersection of Two Arrays

Array Intersection

```java
import java.util.Arrays;
import java.util.HashSet;
import java.util.Set;

public class ArrayIntersection {
    public static int[] intersection(int[] arr1, int[] arr2) {
        Set<Integer> set1 = new HashSet<>();
        Set<Integer> result = new HashSet<>();
        for (int num : arr1) set1.add(num);
        for (int num : arr2) {
            if (set1.contains(num)) result.add(num);
        }
        return result.stream().mapToInt(Integer::intValue).toArray();
    }

    public static void main(String[] args) {
        System.out.println(Arrays.toString(intersection(new int[]{1, 2, 3, 4}, new int[]{3, 4, 5, 6})));
    }
}
```

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📌 **Explanation** : Uses `HashSet` to find common elements between two arrays.

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16. Convert CamelCase to Snake_Case

```java
public class CamelToSnake {
    public static String convertToSnakeCase(String str) {
        return str.replaceAll("([a-z])([A-Z])", "$1_$2").toLowerCase();
    }

    public static void main(String[] args) {
        System.out.println(convertToSnakeCase("camelCaseExample"));
    }
}
```

📌 **Explanation** : Uses regex to insert `_` between lowercase and uppercase characters.

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17. Find Two Numbers that Sum to a Target (Two Sum Problem)

```java
import java.util.HashMap;
import java.util.Map;

public class TwoSum {
    public static int[] findTwoSum(int[] arr, int target) {
        Map<Integer, Integer> map = new HashMap<>();
        for (int i = 0; i < arr.length; i++) {
            int complement = target - arr[i];
            if (map.containsKey(complement)) {
                return new int[]{map.get(complement), i};
            }
            map.put(arr[i], i);
        }
        return new int[]{-1, -1};
    }

    public static void main(String[] args) {
        int[] result = findTwoSum(new int[]{2, 7, 11, 15}, 9);
        System.out.println(result[0] + ", " + result[1]); // Output: 0, 1
    }
}
```

📌 **Explanation** : Uses `HashMap` to check for complement values.

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18. Check if Two Strings are Anagrams

```java
import java.util.HashMap;
import java.util.Map;

public class AnagramCheck {
    public static boolean isAnagram(String s1, String s2) {
        if (s1.length() != s2.length()) return false;
        Map<Character, Integer> map = new HashMap<>();
        for (char ch : s1.toCharArray()) {
            map.put(ch, map.getOrDefault(ch, 0) + 1);
        }
        for (char ch : s2.toCharArray()) {
            map.put(ch, map.getOrDefault(ch, 0) - 1);
        }
        return map.values().stream().allMatch(count -> count == 0);
    }

    public static void main(String[] args) {
        System.out.println(isAnagram("listen", "silent")); // true
        System.out.println(isAnagram("java", "python")); // false
    }
}
```

📌 **Explanation** : Uses a frequency count approach with `HashMap` .

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19. Check if a String is a Palindrome

```java
public class PalindromeCheck {
    public static boolean isPalindrome(String str) {
        str = str.replaceAll("[^a-zA-Z0-9]", "").toLowerCase();
        int left = 0, right = str.length() - 1;
        while (left < right) {
            if (str.charAt(left) != str.charAt(right)) return false;
            left++;
            right--;
        }
        return true;
    }

    public static void main(String[] args) {
        System.out.println(isPalindrome("A man, a plan, a canal: Panama")); // true
    }
}
```

📌 **Explanation** : Cleans the string and checks for palindrome.

---

20. Remove Consecutive Duplicate Words from a Sentence

```java
import java.util.Arrays;
import java.util.LinkedHashSet;
import java.util.Set;

public class RemoveDuplicateWords {
    public static String removeDuplicateWords(String sentence) {
        Set<String> set = new LinkedHashSet<>(Arrays.asList(sentence.split("\\s+")));
        return String.join(" ", set);
    }

    public static void main(String[] args) {
        System.out.println(removeDuplicateWords("hello hello world world java java"));
    }
}
```

📌 **Explanation** : Uses `LinkedHashSet` to maintain order and remove duplicates.

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21. Find the First Repeating Character in a String

```java
import java.util.HashSet;
import java.util.Set;

public class FirstRepeatingChar {
    public static char findFirstRepeatingChar(String str) {
        Set<Character> seen = new HashSet<>();
        for (char ch : str.toCharArray()) {
            if (seen.contains(ch)) {
                return ch;
            }
            seen.add(ch);
        }
        return '_'; // No repeating character found
    }

    public static void main(String[] args) {
        System.out.println(findFirstRepeatingChar("abca")); // Output: 'a'
        System.out.println(findFirstRepeatingChar("abcdef")); // Output: '_'
    }
}
```

📌 **Explanation** : Uses `HashSet` to track characters and returns the first repeating one.

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22. Find the Missing Number in an Array

```java
import java.util.HashSet;
import java.util.Set;

public class MissingNumber {
    public static int findMissingNumber(int[] arr, int n) {
        Set<Integer> set = new HashSet<>();
        for (int num : arr) {
            set.add(num);
        }
        for (int i = 1; i <= n; i++) {
            if (!set.contains(i)) {
                return i;
            }
        }
        return -1; // No missing number found
    }

    public static void main(String[] args) {
        System.out.println(findMissingNumber(new int[]{1, 2, 3, 5}, 5)); // Output: 4
    }
}
```

📌 **Explanation** : Uses `HashSet`to check for the missing number in the sequence.

---

23. Find the Longest Word in a Sentence

```java
public class LongestWord {
    public static String findLongestWord(String sentence) {
        String[] words = sentence.split("\\s+");
        String longest = "";
        for (String word : words) {
            if (word.length() > longest.length()) {
                longest = word;
            }
        }
        return longest;
    }

    public static void main(String[] args) {
        System.out.println(findLongestWord("This is a Java programming interview")); // Output: "programming"
    }
}
```

📌 **Explanation** : Splits the sentence and finds the longest word.

---

24. Find Duplicate Elements in an Array

```java
import java.util.HashSet;
import java.util.Set;

public class DuplicateElements {
    public static Set<Integer> findDuplicates(int[] arr) {
        Set<Integer> seen = new HashSet<>();
        Set<Integer> duplicates = new HashSet<>();
        for (int num : arr) {
            if (!seen.add(num)) {
                duplicates.add(num);
            }
        }
        return duplicates;
    }

    public static void main(String[] args) {
        System.out.println(findDuplicates(new int[]{1, 2, 3, 4, 2, 5, 3})); // Output: [2, 3]
    }
}

```

📌 **Explanation** : Uses `HashSet` to track duplicates efficiently.

---

25. Find the Most Frequent Element in an Array

```java
import java.util.HashMap;
import java.util.Map;

public class MostFrequentElement {
    public static int findMostFrequent(int[] arr) {
        Map<Integer, Integer> map = new HashMap<>();
        int maxCount = 0, mostFrequent = arr[0];
        for (int num : arr) {
            int count = map.getOrDefault(num, 0) + 1;
            map.put(num, count);
            if (count > maxCount) {
                maxCount = count;
                mostFrequent = num;
            }
        }
        return mostFrequent;
    }

    public static void main(String[] args) {
        System.out.println(findMostFrequent(new int[]{1, 3, 2, 3, 4, 3, 5, 3})); // Output: 3
    }
}

```

📌 **Explanation** : Uses `HashMap` to count occurrences and find the most frequent element.

Happy Learning !

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