GATE TECHNICAL TRAINING – DSA CODING PRACTICE PROBLEMS 2026

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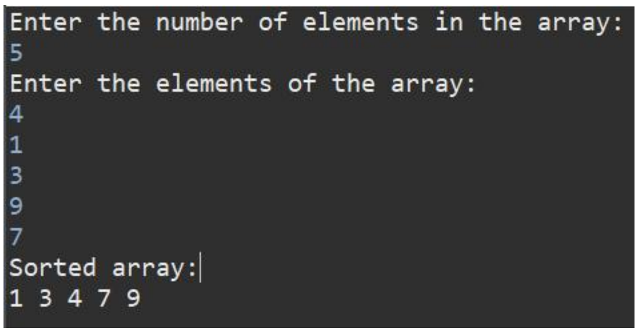
1. BUBBLE SORT

PROGRAM:

```java
package dsaPracticeProblems;
import java.util.Scanner;

class BubbleSort {
    public static void bubbleSort(int arr[]) {
        int n = arr.length;
        for (int i = 0; i < n - 1; i++) {
            for (int j = 0; j < n - i - 1; j++) {
                if (arr[j] > arr[j + 1]) {
                    int temp = arr[j];
                    arr[j] = arr[j + 1];
                    arr[j + 1] = temp;
                }
            }
        }
    }

    static void printArray(int arr[]) {
        int n = arr.length;
        for (int i = 0; i < n; i++) {
            System.out.print(arr[i] + " ");
        }
        System.out.println();
    }

    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);

        System.out.println("Enter the number of elements in the array:");
        int n = scanner.nextInt();

        int[] arr = new int[n];
        System.out.println("Enter the elements of the array:");
        for (int i = 0; i < n; i++) {
            arr[i] = scanner.nextInt();
        }

        bubbleSort(arr);

        System.out.println("Sorted array:");
        printArray(arr);
    }
}
```

OUTPUT:



```
Enter the number of elements in the array:
5
Enter the elements of the array:
4
1
3
9
7
Sorted array:
1 3 4 7 9
```

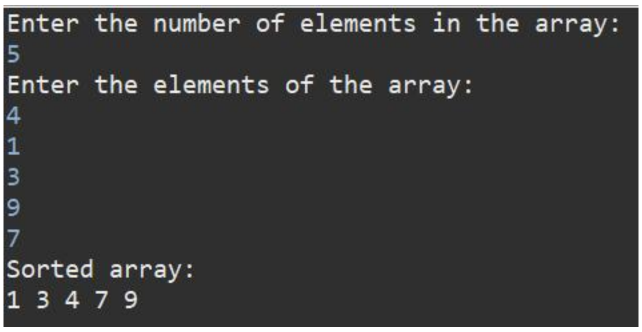
TIME COMPLEXITY: O(n logn)

2. QUICK SORT

PROGRAM:

```java
package dsaPracticeProblems;
import java.util.Scanner;

public class BubbleSort {
    static void quickSort(int arr[], int low, int high) {
        if (low < high) {
            int pivotIndex = partition(arr, low, high);

            quickSort(arr, low, pivotIndex - 1);
            quickSort(arr, pivotIndex + 1, high);
        }
    }

    static int partition(int arr[], int low, int high) {
        int pivot = arr[high];
        int i = low - 1;

        for (int j = low; j < high; j++) {
            if (arr[j] <= pivot) {
                i++;
                int temp = arr[i];
                arr[i] = arr[j];
                arr[j] = temp;
            }
        }

        int temp = arr[i + 1];
        arr[i + 1] = arr[high];
        arr[high] = temp;

        return i + 1;
    }

    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        System.out.println("Enter the number of elements in the array:");
        int n = scanner.nextInt();
        int[] arr = new int[n];
        System.out.println("Enter the elements of the array:");
        for (int i = 0; i < n; i++) {
            arr[i] = scanner.nextInt();
        }

        quickSort(arr, 0, n - 1);

        System.out.println("Sorted array:");
        for (int num : arr) {
            System.out.print(num + " ");
        }
    }
}
```

OUTPUT:



```
Enter the number of elements in the array:
5
Enter the elements of the array:
4
1
3
9
7
Sorted array:
1 3 4 7 9
```

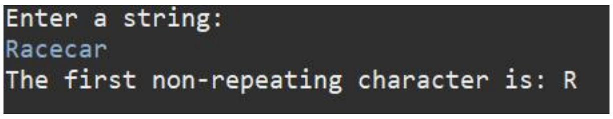
TIME COMPLEXITY: O(n logn)

3. NON-REPEATING CHARACTERS

PROGRAM:

```java
package dsaPracticeProblems;
import java.util.HashMap;
import java.util.Scanner;

class RepeatingString {
    static char nonRepeatingChar(String s) {
        HashMap<Character, Integer> charCount = new HashMap<>();

        for (char c : s.toCharArray()) {
            charCount.put(c, charCount.getOrDefault(c, 0) + 1);
        }

        for (char c : s.toCharArray()) {
            if (charCount.get(c) == 1) {
                return c;
            }
        }
        return '$';
    }

    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        System.out.println("Enter a string:");
        String input = scanner.nextLine();

        char result = nonRepeatingChar(input);
        if (result != '$') {
            System.out.println("The first non-repeating character is: " + result);
        } else {
            System.out.println("No non-repeating character found.");
        }
    }
}
```

OUTPUT:



```
Enter a string:
Racecar
The first non-repeating character is: R
```

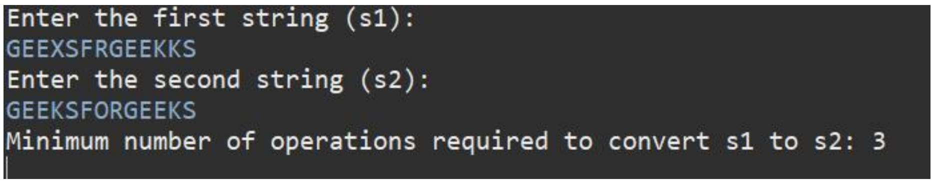
TIME COMPLEXITY: O(n)

4. EDIT DISTANCE

PROGRAM:

```
package dsaPracticeProblems;
import java.util.*;

public class EditDistance {
    public static int editDistRec(String s1, String s2, int m, int n) {
        if (m == 0) return n;

        if (n == 0) return m;

        if (s1.charAt(m - 1) == s2.charAt(n - 1))
            return editDistRec(s1, s2, m - 1, n - 1);

        return 1 + Math.min(Math.min(editDistRec(s1, s2, m, n - 1),
                                      editDistRec(s1, s2, m - 1, n)),
                             editDistRec(s1, s2, m - 1, n - 1));
    }

    public static int editDist(String s1, String s2) {
        return editDistRec(s1, s2, s1.length(), s2.length());
    }

    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);

        System.out.println("Enter the first string (s1):");
        String s1 = sc.nextLine();

        System.out.println("Enter the second string (s2):");
        String s2 = sc.nextLine();

        System.out.println("Minimum number of operations required to convert s1 to s2: " + editDist(s1, s2));
        sc.close();
    }
}
```

OUTPUT:



```
Enter the first string (s1):
GEEXSFRGEEKKS
Enter the second string (s2):
GEEKSFORGEEKS
Minimum number of operations required to convert s1 to s2: 3
```

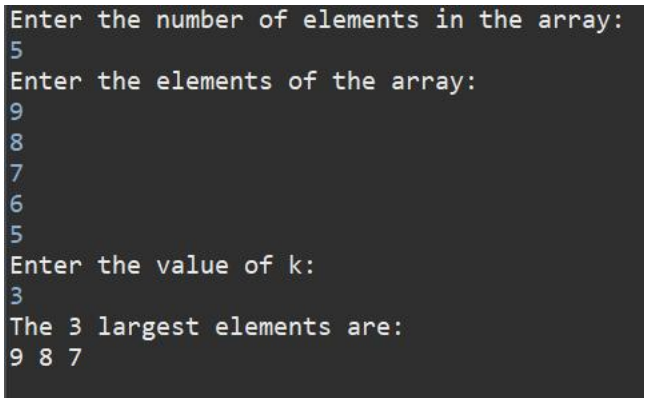
TIME COMPLEXITY: O(3^max(m, n))

5. K LARGEST ELEMENTS

PROGRAM:

```
package dsaPracticeProblems;
import java.util.*;

class KthLargestElement {
    static ArrayList<Integer> kLargest(int[] arr, int k) {
        Integer[] arrInteger = Arrays.stream(arr).boxed().toArray(Integer[]::new);

        Arrays.sort(arrInteger, Collections.reverseOrder());

        ArrayList<Integer> res = new ArrayList<>();
        for (int i = 0; i < k; i++)
            res.add(arrInteger[i]);

        return res;
    }

    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);

        System.out.println("Enter the number of elements in the array:");
        int n = sc.nextInt();

        int[] arr = new int[n];
        System.out.println("Enter the elements of the array:");
        for (int i = 0; i < n; i++) {
            arr[i] = sc.nextInt();
        }

        System.out.println("Enter the value of k:");
        int k = sc.nextInt();

        ArrayList<Integer> res = kLargest(arr, k);

        System.out.println("The " + k + " largest elements are:");
        for (int ele : res) {
            System.out.print(ele + " ");
        }
        sc.close();
    }
}
```

OUTPUT:



```
Enter the number of elements in the array:
5
Enter the elements of the array:
9
8
7
6
5
Enter the value of k:
3
The 3 largest elements are:
9 8 7
```

TIME COMPLEXITY: O(n logn)

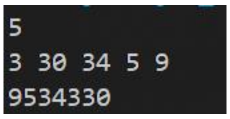
6. FORM LARGEST NUMBERS

PROGRAM:

```
import java.io.*;
import java.util.*;

public class LargestElement {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        int t = sc.nextInt();
        sc.nextLine();
        while (t-- > 0) {
            String input = sc.nextLine();
            String[] numbers = input.split(" ");
            int[] arr = new int[numbers.length];
            for (int i = 0; i < numbers.length; i++) {
                arr[i] = Integer.parseInt(numbers[i]);
            }

            String ans = printLargest(arr);
            System.out.println(ans);
            System.out.println("~");
        }
        sc.close();
    }

    public static String printLargest(int[] arr) {
```

```
    String[] strArr = Arrays.stream(arr)
                            .mapToObj(String::valueOf)
                            .toArray(String[]::new);

    Comparator<String> comp = (X, Y) -> (Y + X).compareTo(X + Y);

    Arrays.sort(strArr, comp);

    if (strArr[0].equals("0")) {
      return "0";
    }

    StringBuilder sb = new StringBuilder();
    for (String num : strArr)
      sb.append(num);

    return sb.toString();
  }
}
```

OUTPUT:



```
5
3 30 34 5 9
9534330
```

TIME COMPLEXITY: O(n logn)