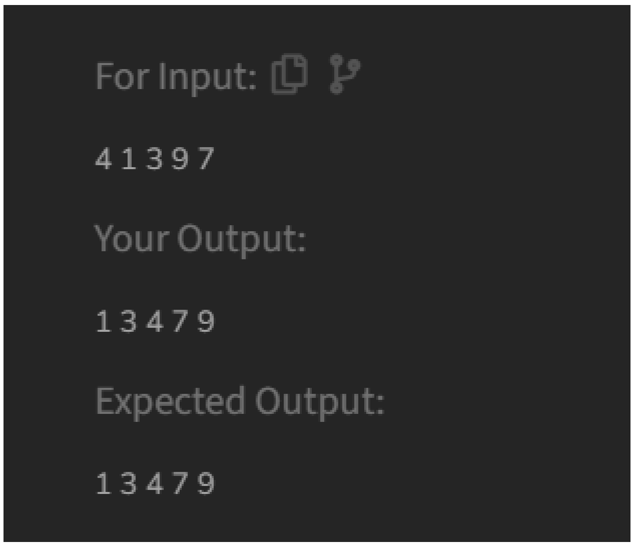
Date: 18/11/2024

DSA Practice Problems

1. **Bubble Sort**

```
class Solution {
   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;
            }
         }
      }

   }
}
```



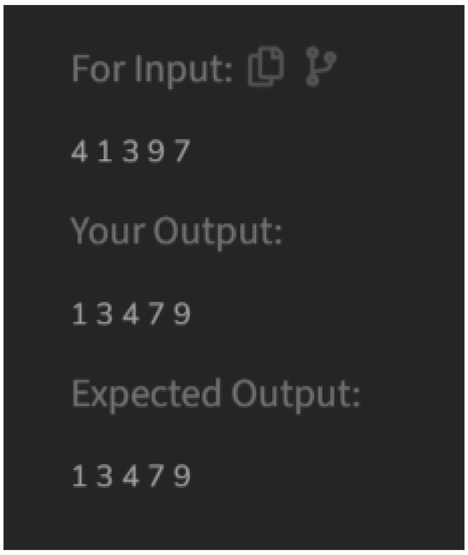
```
For Input:

4 1 3 9 7

Your Output:

1 3 4 7 9

Expected Output:

1 3 4 7 9
```

Time Complexity: O(n^2)

2. **Quick Sort**

```
class Solution {
   static void quickSort(int arr[], int low, int high) {
      if (low < high) {
         int index = partition(arr, low, high);
         quickSort(arr, low, index - 1);
         quickSort(arr, index + 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;
    }
}
```

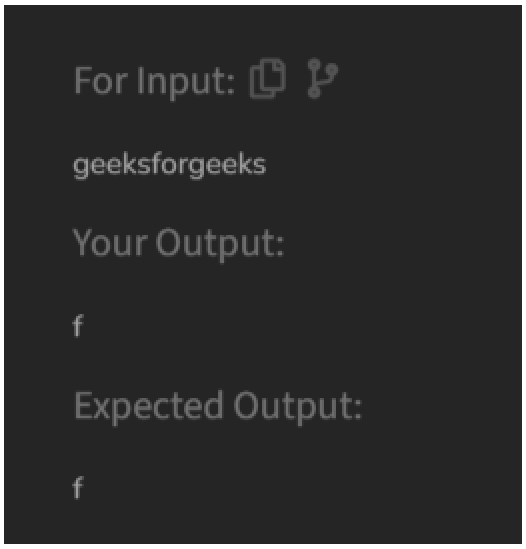


```
For Input:

4 1 3 9 7

Your Output:

1 3 4 7 9

Expected Output:

1 3 4 7 9
```

Time Complexity: O (n log n)

3. **NonRepeating Character**

```
class Solution {

    static char nonRepeatingChar(String s) {

        HashMap<Character, Integer> HashMap1 = new HashMap<>();

        for (char ch : s.toCharArray()) {
            if (HashMap1.containsKey(ch)) {
                HashMap1.put(ch, HashMap1.get(ch) + 1);
            } else {
                HashMap1.put(ch, 1);
            }
        }
        for (char ch : s.toCharArray()) {
            if (HashMap1.get(ch) == 1) {
                return ch;
            }
        }
        return '$';
    }
}
```

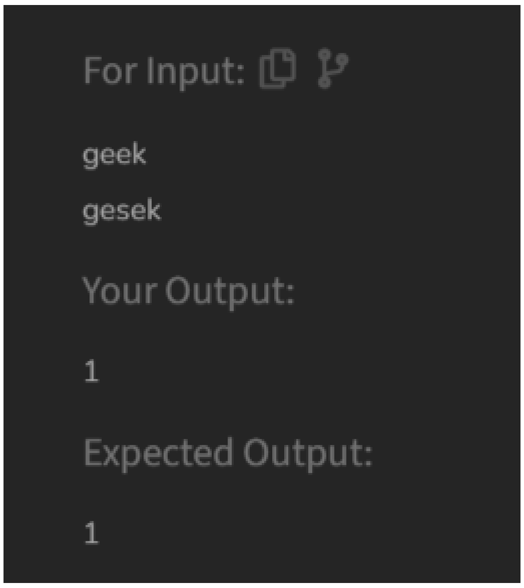


```
For Input:
geeksforgeeks
Your Output:
f
Expected Output:
f
```

Time Complexity: O(n)

4. **Edit Distance**

```
class Solution {
    public int editDistance(String s1, String s2) {
        int m = s1.length();
        int n = s2.length();
        int[][] dp = new int[m + 1][n + 1];
        for (int i = 0; i <= m; i++) {
            dp[i][0] = i;
        }
        for (int j = 0; j <= n; j++) {
            dp[0][j] = j;
        }
        for (int i = 1; i <= m; i++) {
            for (int j = 1; j <= n; j++) {
                if (s1.charAt(i - 1) == s2.charAt(j - 1)) {
                    dp[i][j] = dp[i - 1][j - 1];
                } else {
                    dp[i][j] = 1 + Math.min(dp[i - 1][j],
                            Math.min(dp[i][j - 1],
                                    dp[i - 1][j - 1]));
                }
            }
        }

        return dp[m][n];
    }
}
```

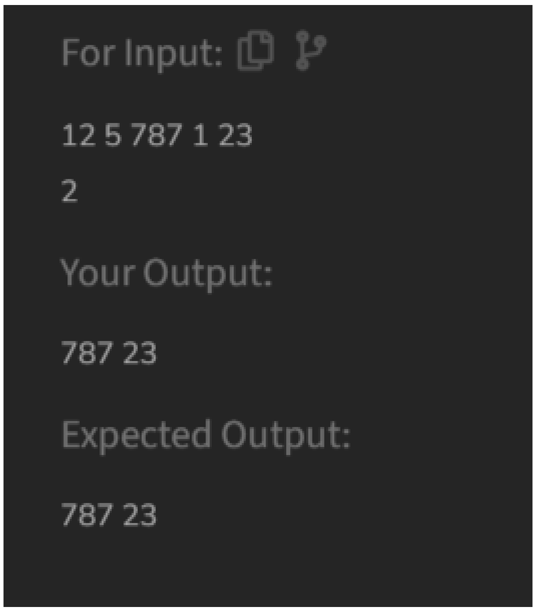


```
For Input:
geek
gesek
Your Output:
1
Expected Output:
1
```

Time Complexity: O(m*n)

5. **K Largest Elements**

```
class Solution {
    static List<Integer> kLargest(int arr[], int k) {
        PriorityQueue<Integer> minheap = new PriorityQueue<>();
        for (int num : arr) {
            minheap.add(num);
            if (minheap.size() > k) {
                minheap.poll();
            }
        }
        List<Integer> result = new ArrayList<>(minheap);
        result.sort(Collections.reverseOrder());
        return result;
    }
}
```

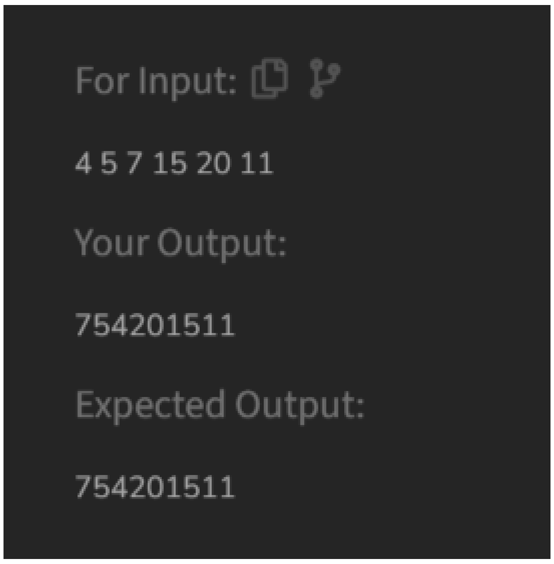


```
For Input:

12 5 787 1 23
2

Your Output:

787 23

Expected Output:

787 23
```

Time Complexity: O (n log k)

6. **Form the Largest Number**

```
class Solution {
    String printLargest(int[] arr) {
        String[] numbers = 
Arrays.stream(arr).mapToObj(String::valueOf).toArray(String[]::new);
        Arrays.sort(numbers, (a, b) -> (b + a).compareTo(a + b));
        String result = String.join("", numbers);
        if (result.startsWith("0")) {
            return "0";
        }

        return result;
    }
}
```


For Input:

```
4 5 7 15 20 11
```

Your Output:

```
754201511
```

Expected Output:

```
754201511
```

Time Complexity: O (n log n)