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18:11:2024

22IT083

1) Form the largest number

```
import java.util.Arrays;
```

```
class Solution {
```

```
    String printLargest(String[] arr) {
```

```
        Arrays.sort(arr, (a, b) -> (b + a).compareTo(a + b));
```

```
        StringBuilder res = new StringBuilder();
```

```
        for (String s : arr) {
```

```
            res.append(s);
```

```
        }
```

```
        return res.charAt(0) == '0' ? "0" : res.toString();
```

```
    }
```

```
    public static void main(String[] args) {
```

```
        String[] arr = {"3", "30", "34", "5", "9"};
```

```
        Solution sol = new Solution();
```

```
        System.out.println(sol.printLargest(arr));
```

```
        String[] arr2 = {"10", "2"};
```

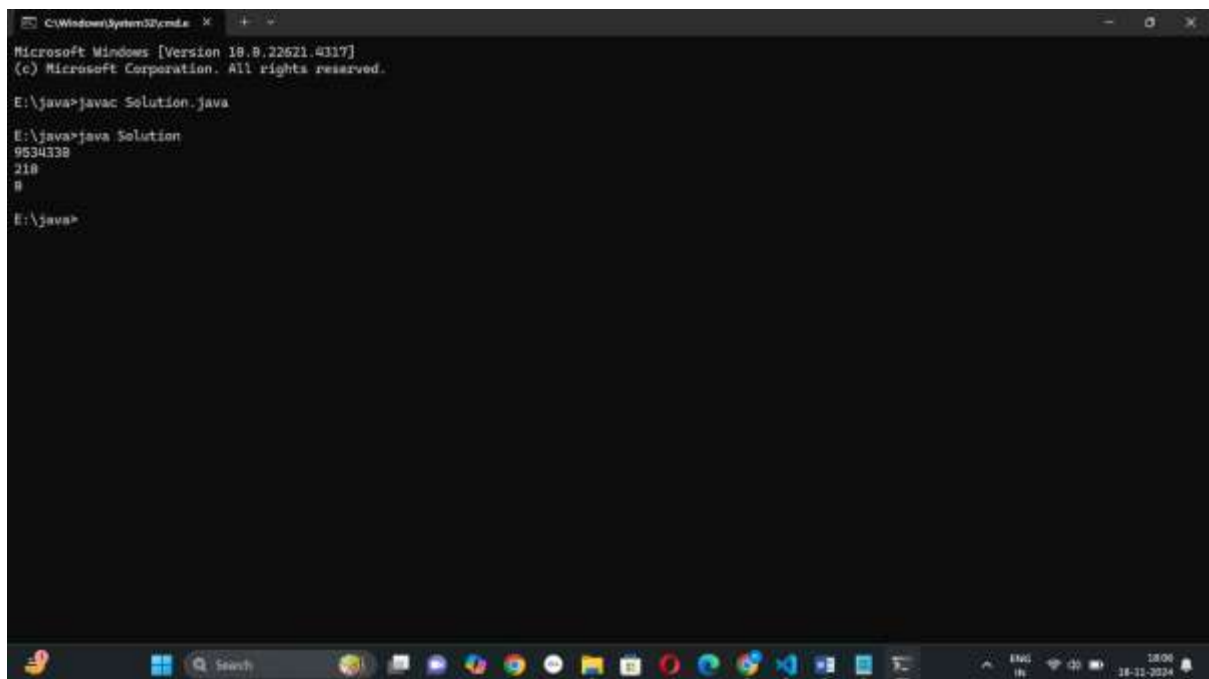
```
        System.out.println(sol.printLargest(arr2));
```

```
        String[] arr3 = {"0", "0"};
```

```
        System.out.println(sol.printLargest(arr3));  
    }  
}
```

OUTPUT:

TC: $O(n)$



The screenshot shows a Windows Command Prompt window with the following text:

```
C:\Windows\system32\cmd.exe  
Microsoft Windows [Version 10.0.22621.4317]  
(c) Microsoft Corporation. All rights reserved.  
  
E:\java>javac Solution.java  
  
E:\java>java Solution  
9534338  
218  
8  
  
E:\java>
```

2) Quicksort

```
import java.util.Arrays;
```

```
class quicksort {
```

```
    // Function to sort an array using quick sort algorithm.
```

```
    static void quickSort(int arr[], int low, int high) {
```

```
        if (low < high) {
```

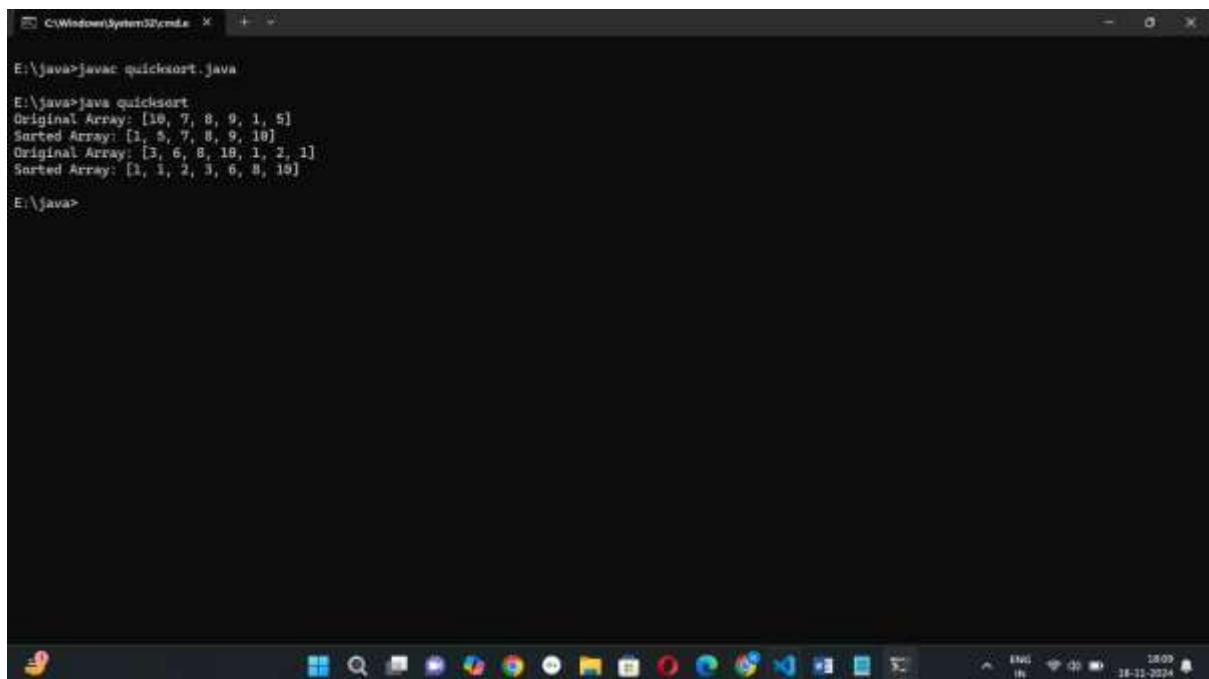
```
    int pivat = partition(arr, low, high);  
    quickSort(arr, low, pivat - 1);  
    quickSort(arr, pivat + 1, high);  
}  
}
```

```
static int partition(int arr[], int low, int high) {  
    int pivat = arr[low];  
    int i = low;  
    int j = high;  
    while (i < j) {  
        while (i <= high && arr[i] <= pivat) {  
            i++;  
        }  
        while (j >= low && arr[j] > pivat) {  
            j--;  
        }  
        if (i < j) {  
            int temp = arr[i];  
            arr[i] = arr[j];  
            arr[j] = temp;  
        }  
    }  
    arr[low] = arr[j];  
    arr[j] = pivat;  
    return j;  
}
```

```
}
```

```
public static void main(String[] args) {  
    int[] arr = {10, 7, 8, 9, 1, 5};  
    System.out.println("Original Array: " + Arrays.toString(arr));  
    quickSort(arr, 0, arr.length - 1);  
    System.out.println("Sorted Array: " + Arrays.toString(arr));  
  
    int[] arr2 = {3, 6, 8, 10, 1, 2, 1};  
    System.out.println("Original Array: " + Arrays.toString(arr2));  
    quickSort(arr2, 0, arr2.length - 1);  
    System.out.println("Sorted Array: " + Arrays.toString(arr2));  
}  
}
```

OUTPUT: TC: $O(n \log n)$



The screenshot shows a Windows command prompt window with the following text:

```
C:\Windows\System32\cmd.exe  
E:\java>javac quicksort.java  
E:\java>java quicksort  
Original Array: [10, 7, 8, 9, 1, 5]  
Sorted Array: [1, 5, 7, 8, 9, 10]  
Original Array: [3, 6, 8, 10, 1, 2, 1]  
Sorted Array: [1, 1, 2, 3, 6, 8, 10]  
E:\java>
```

The taskbar at the bottom shows various application icons and the system clock indicating 18:09 on 18-11-2024.

3) NonRepeated character first

Code:

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

```
class nonrepeatedchar {
```

```
    static char nonRepeatingChar(String s) {
```

```
        HashMap<Character, Integer> hash = new HashMap<>();
```

```
        for (char ch : s.toCharArray()) {
```

```
            hash.put(ch, hash.getOrDefault(ch, 0) + 1);
```

```
        }
```

```
        for (char ch : s.toCharArray()) {
```

```
            if (hash.get(ch) == 1) {
```

```
                return ch;
```

```
            }
```

```
        }
```

```
        return '$';
```

```
    }
```

```
    public static void main(String[] args) {
```

```
        Scanner sc = new Scanner(System.in);
```

```
        String s = sc.nextLine();
```

```

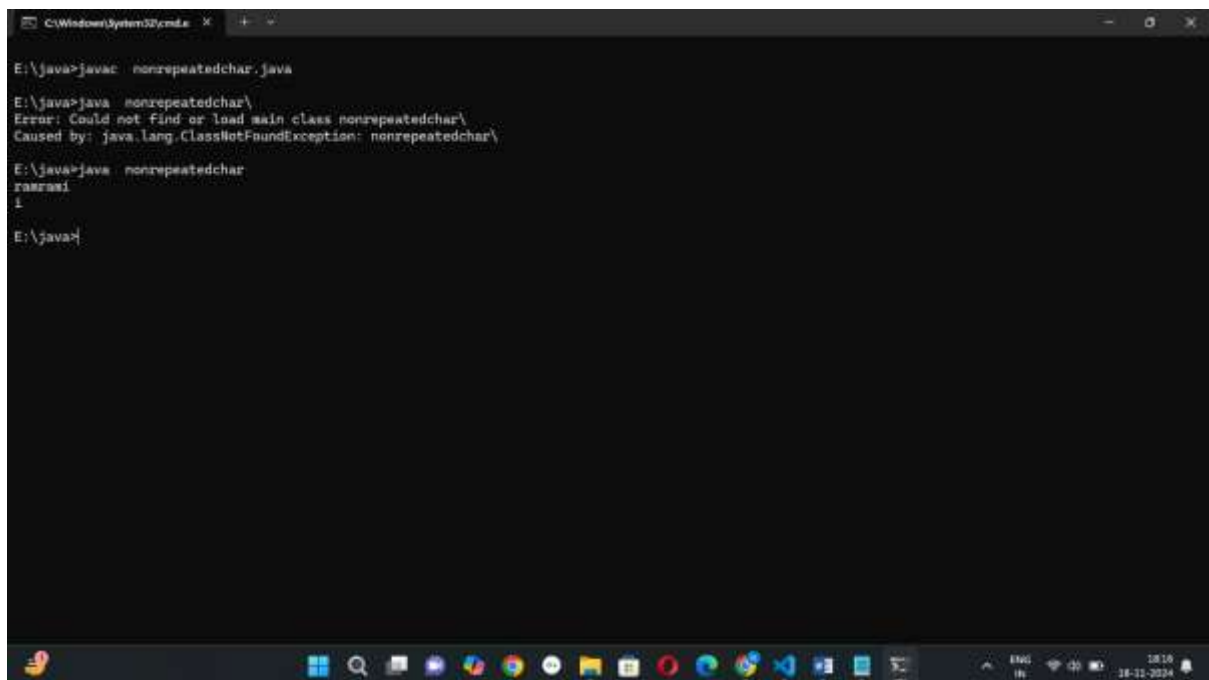
char result = nonRepeatingChar(s);
if (result != '$') {
    System.out.println(result);
} else {
    System.out.println("$");
}

sc.close();
}
}

```

Output:

TC: $O(n)$



```

C:\Windows\System32\cmd.exe
E:\java>javac nonrepeatedchar.java
E:\java>java nonrepeatedchar\
Error: Could not find or load main class nonrepeatedchar\
Caused by: java.lang.ClassNotFoundException: nonrepeatedchar\
E:\java>java nonrepeatedchar
raazani
1
E:\java>

```

4) Kth largest number

```
import java.util.*;

class kthlargest{

    static List<Integer> kLargest(int arr[], int k) {
        int n = arr.length;
        List<Integer> ls = new ArrayList<>(k);
        Arrays.sort(arr);
        for (int i = n - 1; i >= n - k; i--) {
            ls.add(arr[i]);
        }
        return ls;
    }

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

        int n = sc.nextInt();
        int k = sc.nextInt();
        int[] arr = new int[n];
        for (int i = 0; i < n; i++) {
            arr[i] = sc.nextInt();
        }
    }
}
```

```

List<Integer> result = kLargest(arr, k);
for (int num : result) {
    System.out.print(num + " ");
}

sc.close();
}
}

```

Output:

TC: $O(n)$

```

C:\Windows\System32\cmd.exe
E:\java>javac nonrepeatedchar.java
E:\java>java nonrepeatedchar\
Error: Could not find or load main class nonrepeatedchar\
Caused by: java.lang.ClassNotFoundException: nonrepeatedchar\

E:\java>java nonrepeatedchar\
raamrasi
1

E:\java>javac kthLargest.java
E:\java>java kthLargest
2 4 7 1 6
Exception in thread "main" java.lang.ArrayIndexOutOfBoundsException: Index -1 out of bounds for length 2
    at kthLargest.kLargest(kthLargest.java:11)
    at kthLargest.main(kthLargest.java:26)

E:\java>java kthLargest
5
1 7 5 3 8
1 7 5 3 8
8
E:\java>java kthLargest
5
2
1 6 7 4 3
7 6
E:\java>

```

5) Bubblesort array

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

```
class bubblesort{
```



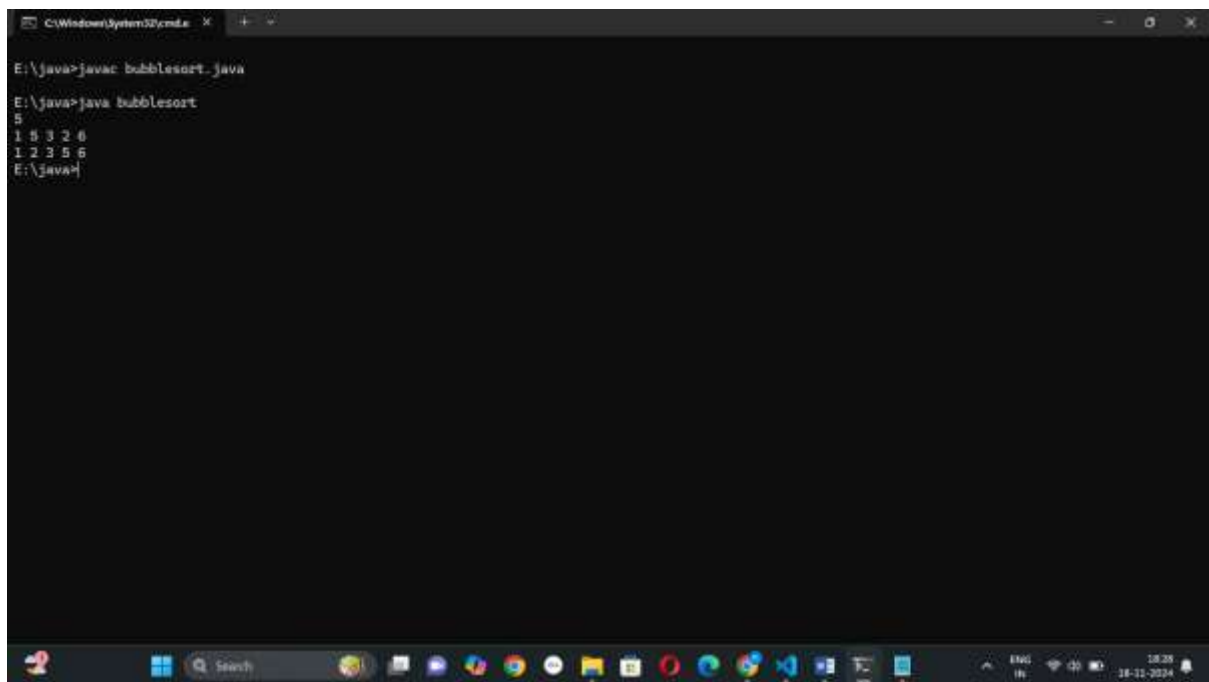
```
public static void bubbleSort(int arr[]) {  
    int n = arr.length;  
    for (int i = n - 1; i > 0; i--) {  
        for (int j = 0; j <= i - 1; j++) {  
            if (arr[j] > arr[j + 1]) {  
                int temp = arr[j + 1];  
                arr[j + 1] = arr[j];  
                arr[j]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

```
public static void main(String[] args) {  
    Scanner sc = new Scanner(System.in);  
  
    int n = sc.nextInt();  
    int[] arr = new int[n];  
    for (int i = 0; i < n; i++) {  
        arr[i] = sc.nextInt();  
    }  
  
    bubbleSort(arr);  
  
    for (int num : arr) {
```

```
        System.out.print(num + " ");  
    }  
  
    sc.close();  
}  
}
```

Output:

TC: $O(n^2)$



The screenshot shows a Windows command prompt window with the title bar "C:\Windows\System32\cmd.exe". The command prompt displays the following text:

```
E:\java>javac bubblesort.java  
E:\java>java bubblesort  
5  
1 5 3 2 6  
1 2 3 5 6  
E:\java>
```

The window's taskbar at the bottom shows various application icons, including the Start button, Search, and several open applications. The system tray on the right indicates the time as 18:39 and the date as 18-11-2024.