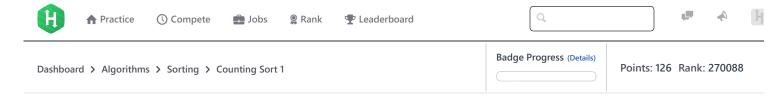
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# Counting Sort 1 ■



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## **Comparison Sorting**

Quicksort usually has a running time of  $n \times log(n)$ , but is there an algorithm that can sort even faster? In general, this is not possible. Most sorting algorithms are *comparison sorts*, i.e. they sort a list just by comparing the elements to one another. A comparison sort algorithm cannot beat  $n \times log(n)$  (worst-case) running time, since  $n \times log(n)$  represents the minimum number of comparisons needed to know where to place each element. For more details, you can see these notes (PDF).

## **Alternative Sorting**

However, for certain types of input, it is more efficient to use a non-comparison sorting algorithm. This will make it possible to sort lists even in linear time. These challenges will cover *Counting Sort*, a fast way to sort lists where the elements have a small number of possible values, such as integers within a certain range. We will start with an easy task - counting.

## Challenge

Given a list of integers, can you count and output the number of times each value appears?

Hint: There is no need to sort the data, you just need to count it.

### **Input Format**

There will be two lines of input:

- n the size of the list
- ullet ar n space-separated numbers that make up the list

# **Output Format**

Output the number of times every number from  ${f 0}$  to  ${f 99}$  (inclusive) appears on the list.

# **Constraints**

 $100 \le n \le 10^6$  $0 \le x < 100, x \in ar$ 

### **Sample Input**

```
100
63 25 73 1 98 73 56 84 86 57 16 83 8 25 81 56 9 53 98 67 99 12 83 89 80 91 39 86 76 85 74 39 25 90 59 10 94 32 44 3 89 30 27 79 46 96
27 32 18 21 92 69 81 40 40 34 68 78 24 87 42 69 23 41 78 22 6 90 99 89 50 30 20 1 43 3 70 95 33 46 44 9 69 48 33 60 65 16 82 67 61 32
21 79 75 75 13 87 70 33
```

## **Sample Output**

## **Explanation**

The output states that 0 appears 0 times, 1 appears 2 times, 2 appears 0 times, and so on in the given input array.

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Difficulty: Easy
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                                                                                                                              \Diamond
 1 ▼ import java.io.*;
 2 import java.util.*;
 3
   import java.text.*;
 4 import java.math.*;
 5
    import java.util.regex.*;
 7 ▼ public class Solution {
 8
 9 ▼
         public static void main(String[] args) {
             /* Enter your code here. Read input from STDIN. Print output to STDOUT. Your class should be named Solution. */
10 ▼
11
12 }
                                                                                                                     Line: 1 Col: 1
                      Test against custom input
                                                                                                         Run Code
                                                                                                                      Submit Code
1 Upload Code as File
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