

# Gold Richie's Safe

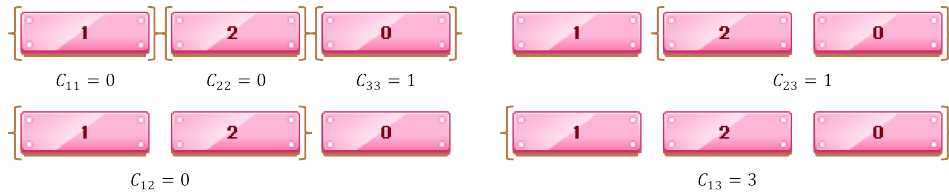
Input file: standard input  
Output file: standard output  
Time limit: 2 seconds  
Memory limit: 1024 megabytes



Gold Richie hosted a new secret safe event for Maple warriors. Maple warriors can enter the event by each typing in a password into the safe. The gold safe, and diamond safe events which were held previously awarded prizes to warriors who entered the smallest unique number as the password.

However this time, for the ruby safe event, Gold Richie plans to use a large amount of money to award all Maple Warriors an equal number of prizes. The number of prizes is determined by the passwords that the Maple Warriors have entered. The number of prizes is determined as follows.

- The  $i$ -th Maple warrior enters an integer  $A_i$  as the password. ( $0 \leq A_i \leq 10^9$ ;  $1 \leq i \leq N$ )
- Let  $C_{lr}$  be the smallest non-negative integer which is not present in  $[A_l, A_{l+1}, \dots, A_{r-1}, A_r]$ . ( $1 \leq l \leq r \leq N$ )
- The number of prizes is the smallest non-negative integer which is not present in the list of all possible  $C_{lr}$  values.



$$\{C_{11}, C_{22}, C_{33}, C_{12}, C_{23}, C_{13}\} = \{0, 0, 1, 0, 1, 3\} \rightarrow 2$$

The Maple Warriors tried to come together to receive as many prizes as possible, but there were too many of them, and had to enter all the passwords without coming to a unified conclusion.

As a Maple Warrior himself, Phantom has entered the ruby safe event, and wishes to receive as many prizes as possible. Seeing that all the passwords have been entered, Phantom, who is Maple World's best thief, has come up with a plan to modify the passwords in a way that maximizes the number of prizes to be received.

It is a piece of cake for Phantom to directly change the password another Maple Warrior has entered, but this has the risk of easily being caught. Thus, he plans to only change the order of  $A_1, A_2, \dots, A_N$ , the passwords which have been entered.

Find out how Phantom has rearranged the passwords such that the number of prizes is maximized.

## Input

The first line of input contains  $N$ , denoting the number of Maple warriors who entered the event. ( $1 \leq N \leq 10^6$ )

The second line of input contains  $N$  space-separated integers  $A_1, A_2, \dots, A_N$ . ( $0 \leq A_i \leq 10^9$ )

## Output

Print the maximum number of prizes which can be received in the first line.

Print the resulting rearranged  $A_1, A_2, \dots, A_N$ , separated by spaces. If there are multiple possible answers, print any one of them.

## Examples

standard input	standard output
3 1 2 0	4 1 0 2
3 1 3 0	3 1 3 0