

7412 Decimal Sequences

Hanako learned the conjecture that all the non-negative integers appear in the infinite digit sequence of the decimal representation of $\pi = 3.14159265\dots$, the ratio of a circle's circumference to its diameter. After that, whenever she watches a sequence of digits, she tries to count up non-negative integers whose decimal representations appear as its subsequences.

For example, given a sequence "3 0 1", she finds representations of five non-negative integers 3, 0, 1, 30 and 301 that appear as its subsequences.

Your job is to write a program that, given a finite sequence of digits, outputs the smallest nonnegative integer not appearing in the sequence. In the above example, 0 and 1 appear, but 2 does not. So, 2 should be the answer.

Input

The input file contains several test cases, each of them as described below.

The input consists of two lines as follows:

```
 $n$   
 $d_1 d_2 \dots d_n$ 
```

n is a positive integer that indicates the number of digits. Each of d_k 's ($k = 1, \dots, n$) is a digit. There is a space or a newline between d_k and d_{k+1} ($k = 1, \dots, n-1$).

You can assume that $1 \leq n \leq 1000$.

Output

For each test case, print the smallest non-negative integer not appearing in the sequence on a line by itself.

Sample Input

```
3  
3 0 1  
11  
9 8 7 6 5 4 3 2 1 1 0  
10  
9 0 8 7 6 5 4 3 2 1  
100  
3 6 7 5 3 5 6 2 9 1 2 7 0 9 3 6 0 6 2  
6 1 8 7 9 2 0 2 3 7 5 9 2 2 8 9 7 3 6  
1 2 9 3 1 9 4 7 8 4 5 0 3 6 1 0 6 3 2  
0 6 1 5 5 4 7 6 5 6 9 3 7 4 5 2 5 4 7  
4 4 3 0 7 8 6 8 8 4 3 1 4 9 2 0 6 8 9  
2 6 6 4 9  
100  
7 2 7 5 4 7 4 4 5 8 1 5 7 7 0 5 6 2 0  
4 3 4 1 1 0 6 1 6 6 2 1 7 9 2 4 6 9 3  
6 2 8 0 5 9 7 6 3 1 4 9 1 9 1 2 6 4 2  
9 7 8 3 9 5 5 2 3 3 8 4 0 6 8 2 5 5 0
```

6 7 1 8 5 1 4 8 1 3 7 3 3 5 3 0 6 0 6
5 3 2 2 2
1
3

Sample Output

2
12
10
11
86
0