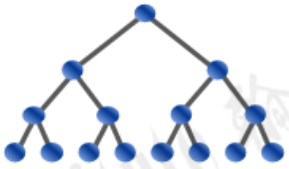
USA Computing Olympiad



USACO 2024 December Contest, Gold
Problem 1. Cowdependence

Contest has ended.

Log in to allow submissions in analysis mode

English (en)

Farmer John's N ($1 \leq N \leq 10^5$) cows have been arranged into a line. The ith cow has label a_i ($1 \leq a_i \leq N$). A group of cows can form a friendship group if they all have the same label and each cow is within x cows of all the others in the group, where x is an integer in the range $[1, N]$. Every cow must be in exactly one friendship group.

For each x from 1 to N, calculate the minimum number of friendship groups that could have formed.

INPUT FORMAT (input arrives from the terminal / stdin):

The first line consists of an integer N.

The next line contains $a_1 \ldots a_N$, the labels of each cow.

OUTPUT FORMAT (print output to the terminal / stdout):

For each x from 1 to N, output the minimum number of friendship groups for that x on a new line.

SAMPLE INPUT:

```
9
1 1 1 9 2 1 2 1 1
```

SAMPLE OUTPUT:

```
7
5
4
4
4
4
4
3
3
```

Here are examples of how to assign cows to friendship groups for $x = 1$ and $x = 2$ in a way that minimizes the number of groups. Each letter corresponds to a different group.

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Example:

      1 1 1 9 2 1 2 1 1
x = 1: A B B C D E F G G (7 groups)
x = 1: A A B C D E F G G (7 groups, alternative grouping)
x = 2: A A A B C D C E E (5 groups)
x = 2: A A A B C D C D E (5 groups, alternative grouping)
```

SCORING:

- Inputs 2-3: $N \leq 5000$
- Inputs 4-7: $a_i \leq 10$ for all i
- Inputs 8-11: No label appears more than 10 times.
- Inputs 12-20: No additional constraints.

Problem credits: Chongtian Ma

Contest has ended. No further submissions allowed.