Teamwork

With the release of the Mooderna vaccine for COWVID-19, Farmer John registered his N cows ($1 \leq N \leq 10^5$). Nonetheless, with strict restrictions from the local pharmacy, the cows must be placed in some valid order, say, a permutation.

Farmer John decided to order his cows with a permutation-based on a_i the amount of milk each cow produces ($1 \leq a_i \leq 10^9$).

Additionally, the local pharmacy requires that each cow is "socially distanced"; thus, each cow gets vaccinated in "teams" of size k. More formally, each team will contain a subset of the cows from i to $i + k - 1$ for all values of i from 1 to $N - k + 1$.

pos_i represents the position that a given cow i would be in if sorted by a_i.

Each team is a subset of size k, represented by the minimum pos_i for that given team. More formally

$$b_j = i, \ \min_{i=j}^{j+k-1} pos_i$$

Each team must be a valid permutation of $1 \ldots k$ so that every cow is vaccinated at least once. More formally, b must be a permutation of $1 \ldots k$.**Note: some cows can be part of multiple teams (no restriction on the number of times vaccinated). Also, each cow a_i is stationary, meaning they cannot rearrange themselves.**

Since Farmer John wants each of his cows to be successfully vaccinated, he asks you to help him see which team sizes work. Please print '1' if making teams of size k does allows every cow to be successfully vaccinated and '0' otherwise.

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

The first line of input contains the integer N.

The next line of input contains N space-separated integers each describing a_i.

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

Please print k space-separated integers, either a '0' or '1', representing whether a given team of size k will allow each of Farmer John's N cows to be vaccinated.

SAMPLE INPUT:

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5
1 5 3 4 2
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SAMPLE OUTPUT:

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1 0 1 1 1
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In the first test case, $a = [1, 5, 3, 4, 2]$.

- When $k = 1$, $b = [1, 5, 3, 4, 2]$ which is a permutation $\Rightarrow 1$.

- When $k = 2$, $b = [1, 3, 3, 2]$ which is not a permutation $\Rightarrow 0$.

- When $k = 3$, $b = [1, 3, 2]$ which is a permutation $\Rightarrow 1$.

- When $k = 4$, $b = [1, 2]$ which is a permutation $\Rightarrow 1$.

- When $k = 5$, $b = [1]$ which is a permutation $\Rightarrow 1$.

Problem credits: Jesse Choe