Problem E: Nth Element in Sliding Window [Hard I]

Time Limit: 1 Sec Memory Limit: 128 MB
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Description

Given a sequence $a_1, a_2, \cdots, a_m$, there is a sliding window of size k from the very left of the sequence to the very right. You can only see the k numbers in the window. Each time the sliding window moves right by one position.

For each time there is an integer n_i, you are asked the n_i-th element in the window. The k-th element indicates that the element will be in the k-th position after sorting in ascending order.

Input

The first line contains two integers m and k, ($1 \le m \le 10^5, 1 \le k \le m$)

The second line contains m distinct integers separated by space a_i
($-2147483648 \le a_i \le 2147483647$).

The next line contains $m - k + 1$ integers separated by space $n_i (1 \le n_i \le k)$

Output

Output $m - k + 1$ lines, each line contain a number represented the answer to each window

Sample Input

```
6 3
201 91 29 13 11 -5
3 1 2 1
```

Sample Output

```
201
13
13
-5
```

HINT

Balanced binary search tree

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