Problem T. Mex Min

Time Limit 4000 ms

Problem Statement

Let us define $\mathrm{mex}(x_1, x_2, x_3, \ldots, x_k)$ as the smallest non-negative integer that does not occur in $x_1, x_2, x_3, \ldots, x_k$.
You are given an integer sequence of length N: $A = (A_1, A_2, A_3, \ldots, A_N)$.
For each integer i such that $0 \leq i \leq N - M$, we compute $\mathrm{mex}(A_{i+1}, A_{i+2}, A_{i+3}, \ldots, A_{i+M})$. Find the minimum among the results of these $N - M + 1$ computations.

Constraints

- $1 \leq M \leq N \leq 1.5 \times 10^6$
- $0 \leq A_i < N$
- All values in input are integers.

Input

Input is given from Standard Input in the following format:

N M
A_1 A_2 A_3 $\ldots$ A_N

Output

Print the answer.

Sample 1

Input	Output
3 2 0 0 1	1

We have:

- for $i = 0$: $\text{mex}(A_{i+1}, A_{i+2}) = \text{mex}(0, 0) = 1$
- for $i = 1$: $\text{mex}(A_{i+1}, A_{i+2}) = \text{mex}(0, 1) = 2$

Thus, the answer is the minimum among 1 and 2, which is 1.

Sample 2

Input	Output
3 2 1 1 1	0

We have:

- for $i = 0$: $\text{mex}(A_{i+1}, A_{i+2}) = \text{mex}(1, 1) = 0$
- for $i = 1$: $\text{mex}(A_{i+1}, A_{i+2}) = \text{mex}(1, 1) = 0$

Sample 3

Input	Output
3 2 0 1 0	2

We have:

- for $i = 0$: $\text{mex}(A_{i+1}, A_{i+2}) = \text{mex}(0, 1) = 2$
- for $i = 1$: $\text{mex}(A_{i+1}, A_{i+2}) = \text{mex}(1, 0) = 2$

Sample 4

Input	Output
7 3 0 0 1 2 0 1 0	2