

B. Gorilla and the Exam

time limit per test: 1 second

memory limit per test: 256 megabytes

Due to a shortage of teachers in the senior class of the "T-generation", it was decided to have a huge male gorilla conduct exams for the students. However, it is not that simple; to prove his competence, he needs to solve the following problem.

For an array b , we define the function $f(b)$ as the smallest number of the following operations required to make the array b empty:

- take two integers l and r , such that $l \leq r$, and let x be the $\min(b_l, b_{l+1}, \dots, b_r)$; then
- remove all such b_i that $l \leq i \leq r$ and $b_i = x$ from the array, the deleted elements are removed, the indices are renumbered.

You are given an array a of length n and an integer k . No more than k times, you can choose any index i ($1 \leq i \leq n$) and any integer p , and replace a_i with p .

Help the gorilla to determine the smallest value of $f(a)$ that can be achieved after such replacements.

Input

Each test contains multiple test cases. The first line contains a single integer t ($1 \leq t \leq 10^4$) — the number of test cases. The description of the test cases follows.

The first line of each set of input data contains two integers n and k ($1 \leq n \leq 10^5$, $0 \leq k \leq n$) — the length of the array a and the maximum number of changes, respectively.

The second line of each set of input data contains n integers $a_1, a_2, \dots, a_n$ ($1 \leq a_i \leq 10^9$) — the array a itself.

It is guaranteed that the sum of the values of n across all sets of input data does not exceed 10^5 .

Output

For each set of input data, output a single integer on a separate line — the smallest possible value of $f(a)$.

Example

input	Copy
6	
1 0	
48843	
3 1	
2 3 2	
5 3	
1 2 3 4 5	
7 0	
4 7 1 3 2 4 1	
11 4	
3 2 1 4 4 3 4 2 1 3 3	
5 5	
1 2 3 4 5	
output	Copy
1	
1	
2	
5	
2	
1	

Note

In the first set of input data, $f([48843]) = 1$, since the array consists of a single number, and thus it can be removed in one operation.

In the second set of input data, you can change the second number to 2, resulting in the array $[2, 2, 2]$, where $f([2, 2, 2]) = 1$, since you can take the entire array as a subarray, the minimum on it is 2, so we will remove all the 2s from the array, and the array will become empty.