



INOI 30

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Tehran, Iran

Summer Camp Programming Finals - Day 2

WATERMELON

en (US)

Watermelon

Aryo and his army went to the north for a war. As we know all of his soldiers are sweating a lot so they have a bad smell. This time Aryo arranges them in a queue. At each moment all of the soldiers who are lower than the soldiers next(right) to them collapse(due to the bad smell) and all of the remaining soldiers move close to each other. Notice that the height of the soldiers is a permutation of the numbers from 1 to n .

For example if the heights of the soldiers in the first moment was $\langle 1, 5, 2, 4, 6, 3 \rangle$ after a moment 3 of them will collapse and remaining soldiers height would be $\langle 5, 6, 3 \rangle$ and after the next moment the queue changes to $\langle 6, 3 \rangle$ and it will remain unchanged for the rest of the day.



Aryo thinks his army is powerful if i th soldier collapses at b_i th moment and hi/she doesn't collapse iff $b_i = -1$.

Aryo thinks an army with permutation p is more beautiful than a permutation q iff a number i exists such that for any $j < i$, there is a number k that $p_k = q_k = j$ and if $p_x = q_y = i$ then $x < y$.

It could be proved that if a permutation p is more beautiful than a permutation q and q is more beautiful than a permutation r then p is more beautiful than r .

Aryo wants to arrange his army such that the army is powerful and among all of the possible permutations he wants the k^{th} beautiful permutation.

Input

The first line of the input contains two integers n — the number of watermelons and then k . The second line contains n integers b_1, b_2, \dots, b_n — the watermelons weight in the queue. The first watermelon is b_1 , the second is b_2 , and so on.

Output

If we have less than k powerful permutation print -1 , otherway print k^{th} beautiful permutation.

Constraints

- $1 \leq n \leq 10^5$
- $1 \leq k \leq 10$
- $-1 \leq b_i \leq n$
- $b_i \neq 0$

Subtasks

Subtasks	score	constraints
1	7	$n \leq 10$
2	25	$n \leq 2000$
3	31	$k \leq 1$
4	18	$k \leq 2$
5	19	No additional constraints.

Examples

Standard input	Standard output
5 1 1 2 1 -1 -1	1 3 2 5 4
5 2 1 2 1 -1 -1	1 4 2 5 3
5 10 1 2 1 -1 -1	-1