


E. Truffula Trouble

time limit per test: 1 second 
memory limit per test: 256 megabytes

The Once-ler is back with his lucrative Thneed business!

There are N truffula trees in a row, and the Once-ler visits them **in order**, starting at the first truffula tree. He starts with a Super-Axe-Hacker with durability d .

Each truffula tree has toughness t_i , and the Once-ler can choose to chop down a truffula tree if and only if the durability of his Super-Axe-Hacker is greater than or equal to the current tree's toughness ($d \geq t_i$). Every time the Once-ler chops down a tree, the durability of his Super-Axe-Hacker decreases by one.

However, this time, the Once-ler wants to avoid chopping down trees unsustainably and angering the Lorax. Therefore, the Once-ler refuses to chop down more than one tree in a row.

However, he still needs to make a profit. Each truffula tree he cuts down can make one Thneed. To reach his quota, he needs to make k Thneeds.

What is the minimum starting durability d_{min} of the Once-ler's Super-Axe-Hacker that guarantees at least k Thneeds will be made?

Input

The first line contains two integers N and k where N is the number of truffula trees, and k is the number of Thneeds the Once-ler needs to make. ($1 \leq N \leq 10^5, 1 \leq k \leq N$)

The next line contains N integers $t_1 \dots t_n$ where t_i is the toughness of the i th truffula tree. ($1 \leq t_i \leq 10^9$)

Output

Output d_{min} , the minimum starting durability that guarantees at least k Thneeds will be made. If it is not possible to make k Thneeds while satisfying all the requirements, output -1 .

Examples

input	Copy
6 2 4 9 2 1 2 10	
output	Copy
3	

input	Copy
6 5 8 8 8 8 8 8	
output	Copy
-1	

Note


In the first example, the Once-ler starts with durability $d = 3$, and chops down the 3rd and 5th trees to create 2 Thneeds.

In the second example, the Once-ler cannot make 5 Thneeds without angering the Lorax.

ICPC Assiut University Training - Juniors Phase 1 Sheets-2022

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→ Group Contests

- Juniors Phase 1 Practice #5 (Bitmask, Bitset, Bits)
- Juniors Phase 1 Practice #4 (Binary search , Two pointers)
- Juniors Phase 1 Practice #3 (STL 2)
- Juniors Phase 1 Practice #2 (STL 1)
- Juniors Phase 1 Practice #1 (Prefix sum , Frequency Array)

Juniors Phase 1 Practice #4 (Binary search , Two pointers)

Finished

Practice



→ About Time Scaling

This contest uses time limits scaling policy (depending on a programming language). The system automatically adjusts time limits by the following multipliers for some languages. Despite scaling (adjustment), the time limit cannot be more than 30 seconds. Read the details by the [link](#).

→ Virtual participation

Virtual contest is a way to take part in past contest, as close as possible to participation on time. It is supported only ICPC mode for virtual contests. If you've seen these problems, a virtual contest is not for you - solve these problems in the archive. If you just want to solve some problem from a contest, a virtual contest is not for you - solve this problem in the archive. Never use someone else's code, read the tutorials or communicate with other person during a virtual contest.

Start virtual contest

→ Submit?

Language: GNU G++20 13.2 (64 bit, win

Choose file: Choose File No file chosen

Submit

→ Last submissions

Submission	Time	Verdict
312322223	Mar/25/2025 16:02	Accepted
312321789	Mar/25/2025 15:59	Wrong answer on test 6
312319551	Mar/25/2025 15:41	Wrong answer on test 6