Wallaby Hop

1 Problem Statement

Wallaby has found N stacks of boxes of different heights for him to hop on! What fun! However, Wallaby can only hop in a specific fashion starting from any stack of his choosing until he either reaches the last stack or cannot make any more hops:

Each hop can only move him to the next stack if the next stack is exactly 1 higher than the current one. Even if the height of the next stack is lower or the same level as the current one, he still cannot move to the next stack as he will die of fall damage (Wallabies are delicate creatures).

For Wallaby to enjoy hopping thoroughly, he has also bought M boxes to add to the stacks. Find the maximum number of hops he can take after adding some of the M boxes to the stacks. (He does not need to use all of them and does not need to end on the last stack)

Formally, find the maximum range [l,r] such that it is possible to add at most M boxes to the stacks in total such that $H_i + 1 = H_{i+1}$ for $l \leq i < r$. Output the size of the range - 1.

2 Input

The input will consist of 2 lines. The first line will contain integers N and M, while the ith integer on the second line contains H_i, the initial height of stack i.

3 Output

Output one integer, the maximum number of hops possible.

4 Subtasks

For all subtasks,

- $1 \leq N \leq 10^5$
- $0 \leq M \leq 10^{18}$
- $1 \leq H_i \leq 10^6$

Subtask	Additional Constraints	Points
1	$1 \leq N \leq 10^2$	10
2	$1 \leq N \leq 10^3$, the maximum number of hops is either 0 or $N-1$	10
3	$1 \leq N \leq 10^3$, H is non-increasing ($H_i \geq H_{i+1}$)	20
4	$1 \leq N \leq 10^3$	20
5	No additional constraints	40

5 Sample

Sample Input 1

6 5
1 3 6 5 1 2

Sample Output 1

2

Sample 1 Explanation

The optimal way to add the boxes is to add 2 to both stack 2 and 4. The heights become 1,5,6,7,1,2. Wallaby starts from stack 2 and hops 2 times from $2 \rightarrow 3$ and $3 \rightarrow 4$