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Fence Painting

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Fence Painting
2.0/2.0 points (graded)

Input file:	fence.in
Output file:	fence.out
Time limit:	2 seconds
Memory limit:	256 megabytes

Tom Sawyer has just persuaded his n friends to help him in an uneasy task of painting a fence, which surrounds the house of Aunt Polly. This fence is built from k consecutive planks, numbered from 1 to k, such that the next plank after the k-th one is the first plank.

Tom's friends are very choosy. The i-th friend agrees to participate in fence painting, only if he is given exactly a_i consecutive planks to paint. As Tom has only one painting brush, his friends will do their job in turn, and will paint the entire segument of a_i planks. Now Tom just has to choose an order, in which to invite his friends, and choose the exact planks to paint for every friend.

Every friend agrees to paint either an uncolored plank or a plank which was painted by one of his predecessors. However, he gets more satisfaction if he paints an uncolored plank. Tom wants to choose a number x and distribute the planks among the friends in such a way that every friend is to paint at least x uncolored planks.

Help Tom to choose the maximum possible x, such that the minimum satisfaction of a friend is as big as possible.

Input
The first line of the input file contains two integer numbers n ($1 \leq n \leq 10^5$) and k ($1 \leq k \leq 10^9$). The next line contains n integer numbers, which are the values of a_i ($1 \leq a_i \leq k$).

Output
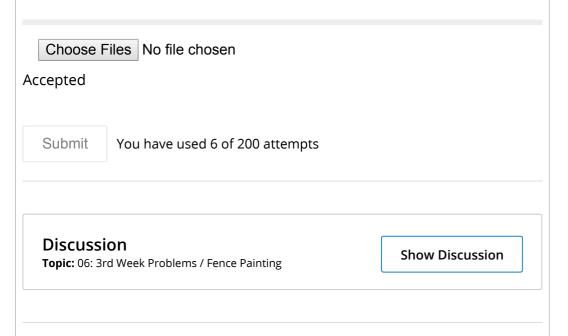
Print the maximum possible value of x.

Examples

fence.in	fence.out
2 100 5 10	5
Download	Download
4 10 7 8 3 5	2
Download	Download

Note

In the first example, x = 5, as one of the friends just does not want to paint more than five planks. He will start first, paint his five planks, then 10 more planks will be assigned to the second Tom's friend. After that, Tom will have to paint himself the remaining 85 planks.

To achieve x = 2 in the second example, Tom may behave as follows. First, the third friend paints three uncolored planks from 4 to 6. Then the fourth friend paints planks from 1 to 5 (of them three are uncolored). Then the second friend paints planks from 1 to 8 (two uncolored). Finally, the first friend paints the planks from 6 to 10 and from 1 to 2 (note that they are contiguous, as the fence is circular; there are two uncolored planks).

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Discussion
Topic: 06: 3rd Week Problems / Fence Painting

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