

Problem J. Kth Lex Min Min Min Subpalindromes

Input file: *standard input*
 Output file: *standard output*
 Time limit: 3 seconds
 Memory limit: 512 mebibytes

Consider all arrays with length n consisting of integers from 1 to m . Let P be the minimum number of *continuous subarrays that are palindromic* one such array can have. Recall that an array is palindromic if it is equal to its own reverse.

Find the k -th lexicographically minimal array with P continuous subarrays that are palindromic. We are still only considering arrays with length n consisting of integers from 1 to m .

In other words, let's take all arrays with length n consisting of integers from 1 to m , leave only those of them that have the minimum number of continuous subarrays that are palindromic, and sort them lexicographically. Your task is to find k -th of them in this order.

Input

The only line of input contains three integers n , m and k ($1 \leq n \leq 10^6$, $1 \leq m \leq 10^6$, $1 \leq k \leq 10^{18}$).

Output

If there are less than k valid arrays, print -1. Otherwise, print the k -th lexicographically minimal of them.

Examples

<i>standard input</i>	<i>standard output</i>
1 1 1	1
2 2 2	2 1
3 3 3	2 1 3
9 9 8244353	2 4 1 2 6 8 1 2 7
10 7 998244353	-1
3 1000 994253860	998 244 353

Note

Did we put min number of min in the title? Min.