D. Maxim and Array

time limit per test: 2 seconds
memory limit per test: 256 megabytes
input: standard input
output: standard output

Recently Maxim has found an array of n integers, needed by no one. He immediately come up with idea of changing it: he invented positive integer x and decided to add or subtract it from arbitrary array elements. Formally, by applying single operation Maxim chooses integer i ($1 \le i \le n$) and replaces the i-th element of array a_i either with $a_i + x$ or with $a_i - x$. Please note that the operation may be applied more than once to the same position.

Maxim is a curious minimalis, thus he wants to know what is the minimum value that the product of all array elements (i.e.) can reach, if Maxim would apply no more than k operations to it. Please help him in that.

Input

The first line of the input contains three integers n, k and x ($1 \le n, k \le 200\,000$, $1 \le x \le 10^9$) — the number of elements in the array, the maximum number of operations and the number invented by Maxim, respectively.

The second line contains n integers $a_1, a_2, ..., a_n$ () — the elements of the array found by Maxim.

Output

Print n integers $b_1, b_2, ..., b_n$ in the only line — the array elements after applying no more than k operations to the array. In particular, should stay true for every $1 \le i \le n$, but the product of all array elements should be **minimum possible**.

If there are multiple answers, print any of them.

Examples

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

input
5 3 1 5 4 3 5 5
output
5 4 0 5 5

input
5 3 1 5 4 4 5 5
output
5 1 4 5 5

input
3 2 7 5 4 2
output
5 11 -5