Codeforces Round #429 (Div. 2)

A. Generous Kefa

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

One day Kefa found n baloons. For convenience, we denote color of i-th baloon as s_i — lowercase letter of the Latin alphabet. Also Kefa has k friends. Friend will be upset, If he get two baloons of the same color. Kefa want to give out **all** baloons to his friends. Help Kefa to find out, can he give out all his baloons, such that no one of his friens will be upset — print «YES», if he can, and «NO», otherwise. Note, that Kefa's friend will not upset, if he doesn't get baloons at all.

Input

The first line contains two integers n and k ($1 \le n, k \le 100$) — the number of baloons and friends.

Next line contains string s — colors of baloons.

Output

Answer to the task — «YES» or «NO» in a single line.

You can choose the case (lower or upper) for each letter arbitrary.

Examples

input
4 2 aabb
output
YES

input
6 3 aacaab
output
NO

Note

In the first sample Kefa can give 1-st and 3-rd baloon to the first friend, and 2-nd and 4-th to the second.

In the second sample Kefa needs to give to all his friends baloons of color *a*, but one baloon will stay, thats why answer is «NO».

B. Godsend

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

Leha somehow found an array consisting of n integers. Looking at it, he came up with a task. Two players play the game on the array. Players move one by one. The first player can choose for his move a subsegment of non-zero length with an odd sum of numbers and remove it from the array, after that the remaining parts are glued together into one array and the game continues. The second player can choose a subsegment of non-zero length with an even sum and remove it. Loses the one who can not make a move. Who will win if both play optimally?

Input

First line of input data contains single integer n ($1 \le n \le 10^6$) — length of the array.

Next line contains n integers $a_1, a_2, \ldots, a_n$ ($0 \le a_i \le 10^9$).

Output

Output answer in single line. "`First`", if first player wins, and "`Second`" otherwise (without quotes).

Examples

input
4 1 3 2 3
output
First

input
2 2 2
output
Second

Note

In first sample first player remove whole array in one move and win.

In second sample first player can't make a move and lose.

C. Leha and Function

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

Leha like all kinds of strange things. Recently he liked the function $F(n, k)$. Consider all possible k-element subsets of the set $[1, 2, ..., n]$. For subset find minimal element in it. $F(n, k)$ — mathematical expectation of the minimal element among all k-element subsets.

But only function does not interest him. He wants to do interesting things with it. Mom brought him two arrays A and B, each consists of m integers. For all i, j such that $1 \le i, j \le m$ the condition $A_i \ge B_j$ holds. Help Leha rearrange the numbers in the array A so that the sum $\sum_{i=1}^{m} F(A'_i, B_i)$ is maximally possible, where A' is already rearranged array.

Input

First line of input data contains single integer m ($1 \le m \le 2 \cdot 10^5$) — length of arrays A and B.

Next line contains m integers $a_1, a_2, ..., a_m$ ($1 \le a_i \le 10^9$) — array A.

Next line contains m integers $b_1, b_2, ..., b_m$ ($1 \le b_i \le 10^9$) — array B.

Output

Output m integers $a'_1, a'_2, ..., a'_m$ — array A' which is permutation of the array A.

Examples

input
5 7 3 5 3 4 2 1 3 2 3
output
4 7 3 5 3

input
7 4 6 5 8 8 2 6 2 1 2 2 1 1 2
output
2 6 4 5 8 8 6

D. Leha and another game about graph

time limit per test: 3 seconds
memory limit per test: 256 megabytes
input: standard input
output: standard output

Leha plays a computer game, where is on each level is given a connected graph with n vertices and m edges. Graph can contain multiple edges, but can not contain self loops. Each vertex has an integer d_i, which can be equal to 0, 1 or -1. To pass the level, he needs to find a «good» subset of edges of the graph or say, that it doesn't exist. Subset is called «good», if by by leaving only edges from this subset in the original graph, we obtain the following: for every vertex i, $d_i = -1$ or it's degree modulo 2 is equal to d_i. Leha wants to pass the game as soon as possible and ask you to help him. In case of multiple correct answers, print any of them.

Input

The first line contains two integers n, m ($1 \le n \le 3 \cdot 10^5$, $n - 1 \le m \le 3 \cdot 10^5$) — number of vertices and edges.

The second line contains n integers $d_1, d_2, \ldots, d_n$ ($-1 \le d_i \le 1$) — numbers on the vertices.

Each of the next m lines contains two integers u and v ($1 \le u, v \le n$) — edges. It's guaranteed, that graph in the input is connected.

Output

Print -1 in a single line, if solution doesn't exist. Otherwise in the first line k — number of edges in a subset. In the next k lines indexes of edges. Edges are numerated in order as they are given in the input, starting from 1.

Examples

input
1 0 1
output
-1

input
4 5 0 0 0 -1 1 2 2 3 3 4 1 4 2 4
output
0

input
2 1 1 1 1 2
output
1 1

input
3 3 0 -1 1 1 2 2 3 1 3
output
1 2

Note

In the first sample we have single vertex without edges. It's degree is 0 and we can not get 1.

E. On the Bench

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

A year ago on the bench in public park Leha found an array of n numbers. Leha believes that permutation p is right if for all $1 \le i < n$ condition, that $a_{p_i} \cdot a_{p_{i+1}}$ is not perfect square, holds. Leha wants to find number of right permutations modulo $10^9 + 7$.

Input

First line of input data contains single integer n ($1 \le n \le 300$) — length of the array.

Next line contains n integers $a_1, a_2, \ldots, a_n$ ($1 \le a_i \le 10^9$) — found array.

Output

Output single integer — number of right permutations modulo $10^9 + 7$.

Examples

input
3 1 2 4

output
2

input
7 5 2 4 2 4 1 1

output
144

Note

For first example:

$[1, 2, 4]$ — right permutation, because 2 and 8 are not perfect squares.

$[1, 4, 2]$ — wrong permutation, because 4 is square of 2.

$[2, 1, 4]$ — wrong permutation, because 4 is square of 2.

$[2, 4, 1]$ — wrong permutation, because 4 is square of 2.

$[4, 1, 2]$ — wrong permutation, because 4 is square of 2.

$[4, 2, 1]$ — right permutation, because 8 and 2 are not perfect squares.