Codeforces Beta Round #22 (Div. 2 Only)

A. Second Order Statistics

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

Once Bob needed to find the second order statistics of a sequence of integer numbers. Lets choose each number from the sequence exactly once and sort them. The value on the second position is the second order statistics of the given sequence. In other words it is the smallest element strictly greater than the minimum. Help Bob solve this problem.

Input

The first input line contains integer n ($1 \leq n \leq 100$) — amount of numbers in the sequence. The second line contains n space-separated integer numbers — elements of the sequence. These numbers don't exceed 100 in absolute value.

Output

If the given sequence has the second order statistics, output this order statistics, otherwise output `NO`.

Sample test(s)

input
4 1 2 2 -4
output
1

input
5 1 2 3 1 1
output
2

B. Bargaining Table

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

Bob wants to put a new bargaining table in his office. To do so he measured the office room thoroughly and drew its plan: Bob's office room is a rectangular room $n \times m$ meters. Each square meter of the room is either occupied by some furniture, or free. A bargaining table is rectangular, and should be placed so, that its sides are parallel to the office walls. Bob doesn't want to change or rearrange anything, that's why all the squares that will be occupied by the table should be initially free. Bob wants the new table to sit as many people as possible, thus its perimeter should be maximal. Help Bob find out the maximum possible perimeter of a bargaining table for his office.

Input

The first line contains 2 space-separated numbers n and m ($1 \le n, m \le 25$) — the office room dimensions. Then there follow n lines with m characters 0 or 1 each. 0 stands for a free square meter of the office room. 1 stands for an occupied square meter. It's guaranteed that at least one square meter in the room is free.

Output

Output one number — the maximum possible perimeter of a bargaining table for Bob's office room.

Sample test(s)

input
3 3 000 010 000
output
8

input
5 4 1100 0000 0000 0000 0000
output
16

C. System Administrator

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

Bob got a job as a system administrator in X corporation. His first task was to connect n servers with the help of m two-way direct connection so that it becomes possible to transmit data from one server to any other server via these connections. Each direct connection has to link two different servers, each pair of servers should have at most one direct connection. Y corporation, a business rival of X corporation, made Bob an offer that he couldn't refuse: Bob was asked to connect the servers in such a way, that when server with index v fails, the transmission of data between some other two servers becomes impossible, i.e. the system stops being connected. Help Bob connect the servers.

Input

The first input line contains 3 space-separated integer numbers n, m, v ($3 \le n \le 10^5$, $0 \le m \le 10^5$, $1 \le v \le n$), n — amount of servers, m — amount of direct connections, v — index of the server that fails and leads to the failure of the whole system.

Output

If it is impossible to connect the servers in the required way, output `-1`. Otherwise output m lines with 2 numbers each — description of all the direct connections in the system. Each direct connection is described by two numbers — indexes of two servers, linked by this direct connection. The servers are numbered from 1. If the answer is not unique, output any.

Sample test(s)

input
5 6 3

output
1 2 2 3 3 4 4 5 1 3 3 5

input
6 100 1

output
-1

D. Segments

time limit per test: 1 second
memory limit per test: 256 megabytes
input: standard input
output: standard output

You are given n segments on the Ox-axis. You can drive a nail in any integer point on the Ox-axis line nail so, that all segments containing this point, are considered nailed down. If the nail passes through endpoint of some segment, this segment is considered to be nailed too. What is the smallest number of nails needed to nail all the segments down?

Input

The first line of the input contains single integer number n $(1 \le n \le 1000)$ — amount of segments. Following n lines contain descriptions of the segments. Each description is a pair of integer numbers — endpoints coordinates. All the coordinates don't exceed 10000 by absolute value. Segments can degenarate to points.

Output

The first line should contain one integer number — the smallest number of nails needed to nail all the segments down. The second line should contain coordinates of driven nails separated by space in any order. If the answer is not unique, output any.

Sample test(s)

input
2 0 2 2 5

output
1 2

input
5 0 3 4 2 4 8 8 10 7 7

output
3 7 10 3

E. Scheme

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

To learn as soon as possible the latest news about their favourite fundamentally new operating system, BolgenOS community from Nizhni Tagil decided to develop a scheme. According to this scheme a community member, who is the first to learn the news, calls some other member, the latter, in his turn, calls some third member, and so on; i.e. a person with index i got a person with index f_i, to whom he has to call, if he learns the news. With time BolgenOS community members understood that their scheme doesn't work sometimes — there were cases when some members didn't learn the news at all. Now they want to supplement the scheme: they *add* into the scheme some instructions of type (x_i, y_i), which mean that person x_i has to call person y_i as well. What is the minimum amount of instructions that they need to add so, that at the end everyone learns the news, no matter who is the first to learn it?

Input

The first input line contains number n $(2 \le n \le 10^5)$ — amount of BolgenOS community members. The second line contains n space-separated integer numbers f_i $(1 \le f_i \le n, i \ne f_i)$ — index of a person, to whom calls a person with index i.

Output

In the first line output one number — the minimum amount of instructions to add. Then output one of the possible variants to add these instructions into the scheme, one instruction in each line. If the solution is not unique, output any.

Sample test(s)

input
3 3 3 2
output
1 3 1

input
7 2 3 1 3 4 4 1
output
3 2 5 2 6 3 7