

Codeforces Beta Round #27 (Codeforces format, Div. 2)**A. Next Test**

time limit per test: 2 seconds

memory limit per test: 256 megabytes

input: standard input

output: standard output

«Polygon» is a system which allows to create programming tasks in a simple and professional way. When you add a test to the problem, the corresponding form asks you for the test index. As in most cases it is clear which index the next test will have, the system suggests the default value of the index. It is calculated as the smallest positive integer which is not used as an index for some previously added test.

You are to implement this feature. Create a program which determines the default index of the next test, given the indexes of the previously added tests.

Input

The first line contains one integer n ($1 \leq n \leq 3000$) — the amount of previously added tests. The second line contains n distinct integers a_1, a_2, \dots, a_n ($1 \leq a_i \leq 3000$) — indexes of these tests.

Output

Output the required default value for the next test index.

Sample test(s)

input
3 1 7 2
output
3

B. Tournament

time limit per test: 2 seconds

memory limit per test: 256 megabytes

input: standard input

output: standard output

The tournament «Sleepyhead-2010» in the rapid falling asleep has just finished in Berland. n best participants from the country have participated in it. The tournament consists of games, each of them is a match between two participants. $n \cdot (n - 1) / 2$ games were played during the tournament, and each participant had a match with each other participant.

The rules of the game are quite simple — the participant who falls asleep first wins. The secretary made a record of each game in the form « $x_i y_i$ », where x_i and y_i are the numbers of participants. The first number in each pair is a winner (i.e. x_i is a winner and y_i is a loser). There is no draws.

Recently researches from the «Institute Of Sleep» have found that every person is characterized by a value p_j — the speed of falling asleep. The person who has lower speed wins. Every person has its own value p_j , constant during the life.

It is known that all participants of the tournament have distinct speeds of falling asleep. Also it was found that the secretary made records about all the games except one. You are to find the result of the missing game.

Input

The first line contains one integer n ($3 \leq n \leq 50$) — the number of participants. The following $n \cdot (n - 1) / 2 - 1$ lines contain the results of the games. Each game is described in a single line by two integers x_i, y_i ($1 \leq x_i, y_i \leq n, x_i \neq y_i$), where x_i and y_i are the numbers of the opponents in this game. It is known that during the tournament each of the n participants played $n - 1$ games, one game with each other participant.

Output

Output two integers x and y — the missing record. If there are several solutions, output any of them.

Sample test(s)

input
4 4 2 4 1 2 3 2 1 3 1
output
4 3

C. Unordered Subsequence

time limit per test: 2 seconds

memory limit per test: 256 megabytes

input: standard input

output: standard output

The sequence is called *ordered* if it is non-decreasing or non-increasing. For example, sequences [3, 1, 1, 0] and [1, 2, 3, 100] are ordered, but the sequence [1, 3, 3, 1] is not. You are given a sequence of numbers. You are to find it's shortest subsequence which is not ordered.

A subsequence is a sequence that can be derived from the given sequence by deleting zero or more elements without changing the order of the remaining elements.

Input

The first line of the input contains one integer n ($1 \leq n \leq 10^5$). The second line contains n space-separated integers — the given sequence. All numbers in this sequence do not exceed 10^6 by absolute value.

Output

If the given sequence does not contain any unordered subsequences, output 0. Otherwise, output the length k of the shortest such subsequence. Then output k integers from the range $[1..n]$ — indexes of the elements of this subsequence. If there are several solutions, output any of them.

Sample test(s)

input
5 67 499 600 42 23
output
3 1 3 5
input
3 1 2 3
output
0
input
3 2 3 1
output
3 1 2 3

D. Ring Road 2

time limit per test: 2 seconds

memory limit per test: 256 megabytes

input: standard input

output: standard output

It is well known that Berland has n cities, which form the Silver ring — cities i and $i + 1$ ($1 \leq i < n$) are connected by a road, as well as the cities n and 1 . The government have decided to build m new roads. The list of the roads to build was prepared. Each road will connect two cities. Each road should be a curve which lies inside or outside the ring. New roads will have no common points with the ring (except the endpoints of the road).

Now the designers of the constructing plan wonder if it is possible to build the roads in such a way that no two roads intersect (note that the roads may intersect at their endpoints). If it is possible to do, which roads should be inside the ring, and which should be outside?

Input

The first line contains two integers n and m ($4 \leq n \leq 100$, $1 \leq m \leq 100$). Each of the following m lines contains two integers a_i and b_i ($1 \leq a_i, b_i \leq n$, $a_i \neq b_i$). No two cities will be connected by more than one road in the list. The list will not contain the roads which exist in the Silver ring.

Output

If it is impossible to build the roads in such a way that no two roads intersect, output `Impossible`. Otherwise print m characters. i -th character should be `i`, if the road should be inside the ring, and `o` if the road should be outside the ring. If there are several solutions, output any of them.

Sample test(s)

input
4 2 1 3 2 4
output
io

input
6 3 1 3 3 5 5 1
output
ooo

E. Number With The Given Amount Of Divisors

time limit per test: 2 seconds

memory limit per test: 256 megabytes

input: standard input

output: standard output

Given the number n , find the smallest positive integer which has exactly n divisors. It is guaranteed that for the given n the answer will not exceed 10^{18} .

Input

The first line of the input contains integer n ($1 \leq n \leq 1000$).

Output

Output the smallest positive integer with exactly n divisors.

Sample test(s)

input
4
output
6
input
6
output
12