

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.

Examples

input
4 2 1 3 2 4
output
io

input
6 3 1 3 3 5 5 1
output
ooo