
Cycles

P36563_en

Dinovè Concurs de Programació de la UPC - Final (2021-09-22)

Given a directed graph with n vertices and m arcs, can you keep exactly n arcs (and remove the rest) in such a way that every vertex belongs to one cycle of the resulting graph?

Input

Input consists of several cases, each one with n and m , followed by n pairs $x y$ to indicate an arc from x to y , with $x \neq y$. Assume $2 \leq n \leq 1000$, $n \leq m \leq 5n$, that vertices are numbered from 0 to $n - 1$, and that there are no repeated arcs.

Output

Print one line for every given graph. If there is no solution, print "no". Otherwise, print "yes" followed by the n chosen arcs in any order. If there is more than one solution, you can print any one. Follow strictly the format of the sample output.

Hint

Consider the max-flow problem.

Sample input

```
3 3
0 1 1 2 2 0
3 4
0 1 1 2 2 1 1 0
4 6
0 2 2 1 1 3 3 0 2 0 3 1
4 6
0 2 2 1 1 3 3 0 2 0 3 1
```

Sample output

```
yes 0 1 1 2 2 0
no
yes 0 2 1 3 2 1 3 0
yes 2 0 3 1 1 3 0 2
```

Problem information

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