

### ITMOx: I2CPx How to win coding competitions: secrets of champions

Help



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Algorithms on **Graphs** 

# 4th Week **Problems**

due Dec 4, 2016 22:00 **CET** 

### 4th Week

**Problems: Training** 

#### Week 5

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# Find a Cycle

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# Find a Cycle

2.0/2.0 points (graded)

Input file:	cycle.in
Output file:	cycle.out
Time limit:	2 seconds
Memory limit:	256 megabytes

The input file contains a description of an unweighted directed graph. You are asked to determine whether this graph contains a cycle. If it does, print any of them.

### Input

The first line of the input file contains two integers N and M (1  $\leq$  N  $\leq$ 100 000,  $M \le 100$  000), the number of vertices and edges in the graph, correspondingly. The following M lines contain descriptions of edges of the graph. Each edge is described by a pair of integers – the indices of the source and target vertex, respectively.

All indices are one-based. The graph may contain loops and multiple edges between the same ordered pair of vertices.

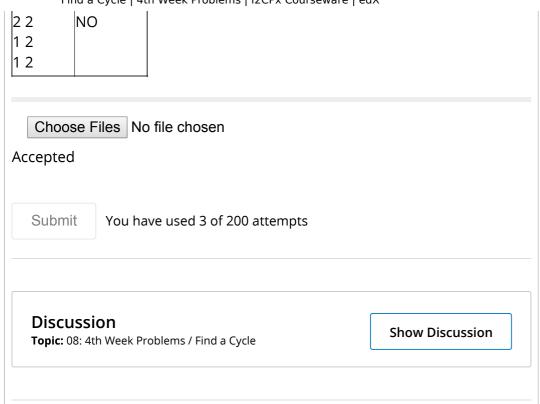
### Output

If the graph does not contain a cycle, print "NO".

Otherwise, print "YES". In the next line print the vertices which consitute a cycle, in the order along this cycle.

# **Example**

cycle.in	cycle.out
2 2	YES
1 2	2 1
2 1	



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