

E. Matching vs Independent Set

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

You are given a graph with $3 \cdot n$ vertices and m edges. You are to find a matching of n edges, **or** an independent set of n vertices.

A set of edges is called a matching if no two edges share an endpoint.

A set of vertices is called an independent set if no two vertices are connected with an edge.

Input

The first line contains a single integer $T \geq 1$ — the number of graphs you need to process. The description of T graphs follows.

The first line of description of a single graph contains two integers n and m , where $3 \cdot n$ is the number of vertices, and m is the number of edges in the graph ($1 \leq n \leq 10^5$, $0 \leq m \leq 5 \cdot 10^5$).

Each of the next m lines contains two integers v_i and u_i ($1 \leq v_i, u_i \leq 3 \cdot n$), meaning that there is an edge between vertices v_i and u_i .

It is guaranteed that there are no self-loops and no multiple edges in the graph.

It is guaranteed that the sum of all n over all graphs in a single test does not exceed 10^5 , and the sum of all m over all graphs in a single test does not exceed $5 \cdot 10^5$.

Output

Print your answer for each of the T graphs. Output your answer for a single graph in the following format.

If you found a matching of size n , on the first line print "Matching" (without quotes), and on the second line print n integers — the indices of the edges in the matching. The edges are numbered from 1 to m in the input order.

If you found an independent set of size n , on the first line print "IndSet" (without quotes), and on the second line print n integers — the indices of the vertices in the independent set.

If there is no matching and no independent set of the specified size, print "Impossible" (without quotes).

You can print edges and vertices in any order.

If there are several solutions, print any. In particular, if there are both a matching of size n , and an independent set of size n , then you should print exactly one of such matchings **or** exactly one of such independent sets.

Example

input

Copy

```
4
1 2
1 3
1 2
1 2
1 3
1 2
2 5
1 2
3 1
1 4
5 1
1 6
2 15
1 2
1 3
```

Codeforces Round #576 (Div. 2)

Finished

Practice



→ Virtual participation

Virtual contest is a way to take part in past contest, as close as possible to participation on time. It is supported only ACM-ICPC mode for virtual contests. If you've seen these problems, a virtual contest is not for you - solve these problems in the archive. If you just want to solve some problem from a contest, a virtual contest is not for you - solve this problem in the archive. Never use someone else's code, read the tutorials or communicate with other person during a virtual contest.

Start virtual contest

→ Practice

You are registered for practice. You can solve problems unofficially. Results can be found in the contest status and in the bottom of standings.

→ Clone Contest to Mashup

You can clone this contest to a mashup.

Clone Contest

→ Submit?

Language:

Choose file: [浏览...](#)

Be careful: there is 50 points penalty for submission which fails the pretests or resubmission (except failure on the first test, denial of judgement or similar verdicts). "Passed pretests" submission verdict doesn't guarantee that the solution is absolutely correct and it will pass system tests.

Submit

→ Last submissions

| Submission | Time | Verdict |
|--------------------------|-------------------|---------------------------------|
| 58090501 | Jul/31/2019 20:21 | Time limit exceeded on test 102 |
| 58090475 | Jul/31/2019 20:21 | Compilation error |
| 58090355 | Jul/31/2019 20:18 | Time limit exceeded on test 102 |
| 58090292 | Jul/31/2019 20:16 | Time limit exceeded on test 5 |
| 58089858 | Jul/31/2019 20:07 | Time limit exceeded on test 5 |

| |
|---|
| 1 4 |
| 1 5 |
| 1 6 |
| 2 3 |
| 2 4 |
| 2 5 |
| 2 6 |
| 3 4 |
| 3 5 |
| 3 6 |
| 4 5 |
| 4 6 |
| 5 6 |
| output Copy |
| Matching 2 IndSet 1 IndSet 2 4 Matching 1 15 |

Note

The first two graphs are same, and there are both a matching of size 1 and an independent set of size 1. Any of these matchings and independent sets is a correct answer.

The third graph does not have a matching of size 2, however, there is an independent set of size 2. Moreover, there is an independent set of size 5: 2 3 4 5 6. However such answer is not correct, because you are asked to find an independent set (or matching) of size **exactly** n .

The fourth graph does not have an independent set of size 2, but there is a matching of size 2.

| | | |
|--------------------------|-------------------|------------------------|
| 58089671 | Jul/31/2019 20:02 | Wrong answer on test 1 |
| 58089352 | Jul/31/2019 19:55 | Wrong answer on test 1 |

→ Problem tags

constructive algorithms graphs
No tag edit access

→ Contest materials

- Announcement (en) ✕
- Tutorial (en) ✕

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