

Social engineering

Problem ID: socialengineering

A social network consists of an undirected connected graph with N vertices, where each vertex is a person, and two people are friends if there is an edge between them.

Maria is a member of this social network. She likes challenging her friends to do various things. This means that she first performs some simple task, posts about it, and then she challenges one of her friends to do the same. This challenge will then travel around the network. It could happen that the same person gets challenged more than once, but each unordered pair of friends can only take part in the challenge at most once. In other words, the challenge will be a walk in the graph that never uses an edge more than once.

The only way for a person to lose the challenge is if it's their turn and they can't challenge any of their friends. Maria always starts, but somehow she has managed to not lose a single time so far. Now the remaining $N - 1$ people have decided to collaborate in order to make Maria lose the next challenge, and it is your job to coordinate this effort.

Interaction

The first line of input contains two positive integers N and M ($2 \leq N \leq 2 \cdot 10^5$, $1 \leq M \leq 4 \cdot 10^5$), the number of vertices and the number of edges in the graph.

The next M lines each contain two integers u_i, v_i ($1 \leq u_i \neq v_i \leq N$), meaning that an edge goes between vertices u_i and v_i . The graph will be connected, and there will be no self-loops or duplicate edges. Maria is the vertex 1 in this graph.

After reading the input, you should print one line with a string "YES" if you have a winning strategy, or "NO" if Maria has a winning strategy. In the latter case, your program should terminate and you will pass the test case if Maria indeed had a winning strategy. In the former case, your program should start interacting with the judge:

Whenever it is Maria's (vertex 1's) turn, you should input a single number x . If $x = 0$, then it means that Maria gives up, and your program should terminate. If $x \neq 0$, it means that Maria challenges vertex x , so that it now becomes x 's turn. Maria always makes legal moves when possible, so x will always be one of her friends, and no challenge has taken part between them before.

Whenever it is x 's turn where $x \neq 1$, you should make a move by printing a single integer y . This means that person x challenges their friend y so that it becomes y 's turn. If you make an illegal move, you will get wrong answer. Remember to flush the output after each move, even if it is your turn again.

Scoring

| Group | Score | Constraints |
|-------|-------|--|
| 1 | 15 | $N, M \leq 10$ |
| 2 | 15 | Everyone except Maria has at most 2 friends |
| 3 | 20 | If Maria doesn't have a winning strategy, she will give up immediately |
| 4 | 25 | $N, M \leq 100$ |
| 5 | 25 | No further constraints |