G. Eulerian Line Graph

time limit per test: 2 seconds
memory limit per test: 256 megabytes

Aryan loves graph theory more than anything. Well, no, he likes to flex his research paper on line graphs to everyone more. To start a conversation with you, he decides to give you a problem on line graphs. In the mathematical discipline of graph theory, the line graph of a simple undirected graph G is another simple undirected graph $L(G)$ that represents the adjacency between every two edges in G.

Precisely speaking, for an undirected graph G without self-loops or multiple edges, its line graph $L(G)$ is a graph such that

- Each vertex of $L(G)$ represents an edge of G.
- Two vertices of $L(G)$ are adjacent if and only if their corresponding edges share a common endpoint in G.

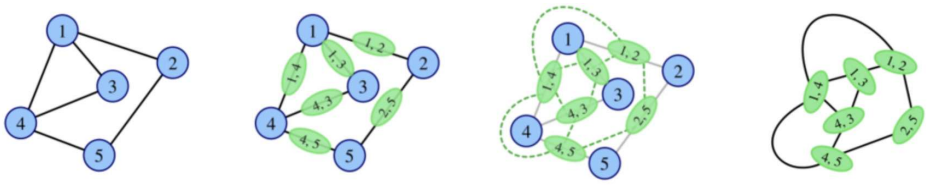

Figure: Generation of the Line Graph

Also, $L^0(G) = G$ and $L^k(G) = L(L^{k-1}(G))$ for $k \geq 1$.

An Euler trail is a sequence of edges that visits every edge of the graph exactly once. This trail can be either a path (starting and ending at different vertices) or a cycle (starting and ending at the same vertex). Vertices may be revisited during the trail, but each edge must be used exactly once.

Aryan gives you a simple connected graph G with n vertices and m edges and an integer k, and it is guaranteed that G has an Euler trail and it is not a path graph*. He asks you to determine if $L^k(G)$ has an Euler trail.

*A path graph is a tree where every vertex is connected to atmost two other vertices.

Input

Each test contains multiple test cases. The first line contains the number of test cases t ($1 \leq t \leq 10^4$). The description of the test cases follows.

The first line of each test case contains three space-separated integers n, m, and k ($5 \leq n \leq 2 \cdot 10^5$, $n - 1 \leq m \leq \min(\frac{n \cdot (n-1)}{2}, 2 \cdot 10^5)$, $1 \leq k \leq 2 \cdot 10^5$).

The next m lines of each test case contain two space-separated integers u and v ($1 \leq u, v \leq n$, $u \neq v$), denoting that an edge connects vertices u and v.

It is guaranteed that the sum of n and m over all test cases does not exceed $2 \cdot 10^5$.

Output

For each testcase, print "YES" if $L^k(G)$ has an Euler trail; otherwise, "NO".

You can output the answer in any case (upper or lower). For example, the strings "yEs", "yes", "Yes", and "YES" will be recognized as positive responses.

Example

input Copy

```
4
5 5 2
1 2
2 3
3 4
4 5
5 1
5 6 1
1 2
2 3
3 4
4 5
5 1
1 3
10 11 3
1 2
2 3
3 4
4 5
4 6
4 7
5 7
6 7
7 8
8 9
9 10
7 8 2
1 3
2 3
1 4
4 5
2 5
1 6
6 7
2 7
```

output Copy

```
YES
NO
YES
NO
```

Note

For the first test case, $L^2(G)$ is isomorphic to G itself. So, since G has an Euler trail, $L^2(G)$ also has an Euler trail.

For the second test case, $L(G)$ looks as follows(Vertex $i-j$ of $L(G)$ in figure corresponds to edge between vertices i and j of G). It can be proven that this doesn't have an Euler trail.

→ Contest materials

- Announcement (en)
- Statements #1 (ru)
- Statements #2 (en)
- Tutorial (en)