

Grotesque Team Reconstruction

Input file: **standard input**
Output file: **standard output**
Time limit: **2 seconds**
Memory limit: **1024 megabytes**

There exists a university with $n = 3k + 1$ (with k being a non-negative integer) students who are passionate about programming competitions. Among these students, due to their shared interests and goals, there arises a strong desire to form teams. This desire can be abstracted as m given relationships: if the i -th relationship is (a_i, b_i) , it indicates that student a_i wishes to team up with student b_i . In other words, this forms an undirected graph with n vertices (representing students) and m edges (representing team formation desires).

However, for some unknown reason, Little Dark Fish loves to break apart these dream-filled students in a grotesque manner, preventing them from forming standard teams of three to participate in important competitions. The evil plan is to forcibly assign these n students to two completely independent and isolated "new schools," which we will call school S_1 and school S_2 . This assignment must strictly adhere to the following cruel and twisted rules:

- Each student must be assigned to one of the two schools and can only belong to one campus. That is, the intersection of the student sets S_1 and S_2 must be empty ($S_1 \cap S_2 = \emptyset$), and their union must encompass all students ($\{1, 2, \dots, n\}$).
- The number of students assigned to the two schools, $|S_1|$ and $|S_2|$, must both satisfy the condition of being congruent to 2 modulo 3 (i.e., $|S_1| \equiv 2 \pmod{3}$ and $|S_2| \equiv 2 \pmod{3}$).
- Although the schools are separated, the students within each school must maintain some form of "unity." Specifically, considering only the students within school S_1 and the subgraph formed by their original team formation desires (i.e., the induced subgraph of S_1), this subgraph must be connected. Similarly, the induced subgraph of school S_2 must also be connected.

Little Dark Fish wants you to recall the definition of an induced subgraph:

- For an undirected graph $G = (V, E)$ and a subset of vertices $S \subseteq V$, the induced subgraph $G[S]$ is a new graph where the vertex set is S itself, and the edge set contains all edges from the original graph G where both endpoints are within the vertex set S . In other words, for any two distinct vertices $u, v \in S$, the edge (u, v) exists in the induced subgraph $G[S]$ if and only if the edge (u, v) exists in the original graph G .

Little Dark Fish wants you to determine whether there exists a valid team division scheme.

Input

Each test case contains multiple sets of test data. The first line contains an integer T ($1 \leq T \leq 10^5$), indicating the number of test cases. For each test case:

- The first line contains two integers n, m ($4 \leq n \leq 5 \times 10^5, 0 \leq m \leq 5 \times 10^5$), ensuring that $n \equiv 1 \pmod{3}$.
- The next m lines each contain two integers u, v ($1 \leq u, v \leq n, u \neq v$), representing an edge.

It is guaranteed that the sum of n across all test cases does not exceed 5×10^5 , and the sum of m does not exceed 5×10^5 .

Output

For each test case, if there exists a valid division scheme, output one line with **Yes**. Otherwise, output one line with **No**.

Example

standard input	standard output
6	Yes
4 4	No
1 2	Yes
2 3	Yes
3 4	No
4 1	No
4 3	
1 2	
1 3	
1 4	
4 4	
1 2	
1 3	
1 4	
2 3	
4 6	
1 2	
1 2	
1 2	
1 2	
3 4	
3 4	
4 0	
7 6	
1 2	
1 3	
2 4	
2 5	
3 6	
3 7	

Note

In the first sample test case, Little Dark Fish only needs to assign students $\{1, 2\}$ to the first school and $\{3, 4\}$ to the second school to solve the problem.

In the second sample test case, we can find that no matter how the division is made, it cannot meet Little Dark Fish's conditions.

In the third sample test case, Little Dark Fish only needs to assign students $\{1, 4\}$ to the first school and $\{2, 3\}$ to the second school to solve the problem.

In the fourth sample test case, Little Dark Fish only needs to assign students $\{1, 2\}$ to the first school and $\{3, 4\}$ to the second school to solve the problem. Note that the problem does not guarantee that the undirected graph does not contain multiple edges, and this sample test case does contain multiple edges.