

F. Superb Graphs

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

As we all know, Aryan is a funny guy. He decides to create fun graphs. For a graph G , he defines fun graph G' of G as follows:

- Every vertex v' of G' maps to a non-empty independent set* or clique[†] in G .
- The sets of vertices of G that the vertices of G' map to are pairwise disjoint and combined cover all the vertices of G , i.e., the sets of vertices of G mapped by vertices of G' form a partition of the vertex set of G .
- If an edge connects two vertices v'_1 and v'_2 in G' , then there is an edge between every vertex of G in the set mapped to v'_1 and every vertex of G in the set mapped to v'_2 .
- If an edge does not connect two vertices v'_1 and v'_2 in G' , then there is not an edge between any vertex of G in the set mapped to v'_1 and any vertex of G in the set mapped to v'_2 .

As we all know again, Harshith is a superb guy. He decides to use fun graphs to create his own superb graphs. For a graph G , a fun graph G'' is called a superb graph of G if G'' has the minimum number of vertices among all possible fun graphs of G .

Aryan gives Harshith k simple undirected graphs[‡] G_1, G_2, \dots, G_k , all on the same vertex set V . Harshith then wonders if there exist k other graphs H_1, H_2, \dots, H_k , all on some other vertex set V' such that:

- G_i is a superb graph of H_i for all $i \in \{1, 2, \dots, k\}$.
- If a vertex $v \in V$ maps to an independent set of size greater than 1 in one G_i, H_i ($1 \leq i \leq k$) pair, then there exists no pair G_j, H_j ($1 \leq j \leq k, j \neq i$) where v maps to a clique of size greater than 1.

Help Harshith solve his wonder.

* For a graph G , a subset S of vertices is called an independent set if no two vertices of S are connected with an edge.

† For a graph G , a subset S of vertices is called a clique if every vertex of S is connected to every other vertex of S with an edge.

‡ A graph is a simple undirected graph if its edges are undirected and there are no self-loops or multiple edges between the same pair of vertices.

Input

Each test contains multiple test cases. The first line contains the number of test cases t ($1 \leq t \leq 100$). The description of the test cases follows.

The first line of each test case contains two integers n and k ($1 \leq n \leq 300, 1 \leq k \leq 10$).

Then, there are k graphs described. The first line of each graph description contains a single integer m ($0 \leq m \leq \frac{n \cdot (n-1)}{2}$).

Next m lines each 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 m over all graphs over all test cases does not exceed $2 \cdot 10^5$, and the sum of n over all test cases does not exceed 300.

Output

For each testcase, print "Yes" if there exists k graphs satisfying the conditions; otherwise, "No".

Codeforces Round 1033 (Div. 2) and CodeNite 2025

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 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

→ Clone Contest to Mashup

You can clone this contest to a mashup.

Clone Contest

→ Submit?

Language: GNU G++23 14.2 (64 bit, ms)

Choose file: No file chosen

Submit

→ Last submissions

Submission	Time	Verdict
325583166	Jun/22/2025 17:26	Accepted

→ Problem tags

2-sat graphs

No tag edit access

→ Contest materials

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

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

```
3
5 2
3
3 4
5 3
5 1
6
3 5
3 4
1 4
1 2
2 3
4 2
4 3
0
3
3 1
1 4
1 2
4
4 2
4 3
1 2
2 3
3 2
0
3
3 1
3 2
1 2
```

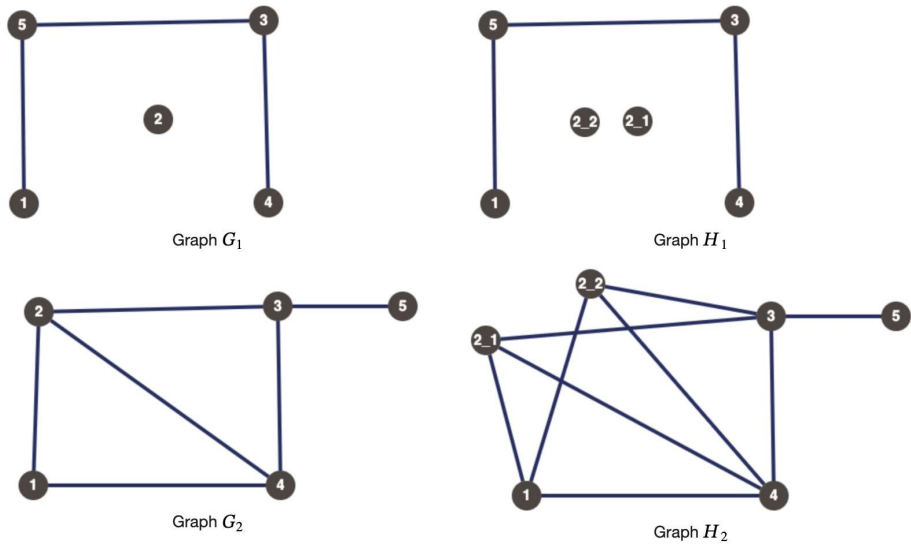
output

Copy

```
Yes
Yes
No
```

Note

For the first test case, the following are the graphs of G_1, H_1 and G_2, H_2 such that G_1 is superb graph of H_1 and G_2 is superb graph of H_2 .



In each graph, vertex 2 of G_i corresponds to independent set $\{2_1, 2_2\}$ of corresponding H_i and remaining vertices $v \in \{1, 3, 4, 5\}$ of G_i correspond to independent set/clique $\{v\}$ in corresponding H_i (a single vertex set can be considered both an independent set and a clique).

In the third test case, it can be proven that the answer is "No".

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