

# Bipartite Graphs 1

A graph  $G = (V, E)$  is bipartite if there exist partitions  $A$  and  $B$  of  $V$  such that for every edge, one of its endpoints is in  $A$  and the other in  $B$  (Note that a graph with no edges is vacuously bipartite). You are given an *undirected* graph. You have to check whether the graph is bipartite or not.

You are expected to give an algorithm that runs in time  $\mathcal{O}(|V| + |E|)$  on a given graph  $G = (V, E)$ .

## Input Format

The first line contains  $S$ , the number of graphs. The following lines describe the graphs.

For every graph, first, the number of vertices ( $|V|$ ) and number of edges ( $|E|$ ) is given on a single line separated by a space.

The next  $|E|$  lines contain  $u$  and  $v$  separated by a space where  $(u, v)$  is an edge in the graph.

## Constraints

$$1 \leq S \leq 10000$$

$$1 \leq |V| \leq 10000$$

## Output Format

For every graph, print "Yes" on a separate line if the graph is bipartite and "No" if not.

## Sample Input 0

```
2
5 3
1 4
2 4
3 5
5 5
2 4
1 4
3 5
4 5
2 5
```

## Sample Output 0

```
Yes
No
```