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## Bipartite Graph

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### Bipartite Graph

2.0/2.0 points (graded)

Input file:	bipartite.in
Output file:	bipartite.out
Time limit:	2 seconds
Memory limit:	256 megabytes

An undirected graph  $(V, E)$  is called *bipartite*, if its vertices can be split into two sets  $L$  and  $R$ , such that  $L \cap R = \emptyset$ ,  $L \cup R = V$ , and for every edge  $(u, v) \in E$  it holds that either:

- $u \in L$  and  $v \in R$ , or
- $u \in R$  and  $v \in L$ .

You are given an undirected graph. Check whether it is bipartite.

### Input

The first line of the input file contains two integers  $N$  and  $M$  ( $1 \leq N \leq 100\,000, M \leq 200\,000$ ), the number of vertices and edges in the graph, correspondingly. The following  $M$  lines contain descriptions of edges of the graph. Each edge is described by a pair of integers – the indices of the source and target vertex, respectively.

All indices are one-based. The graph may contain loops and multiple edges between the same pair of vertices.

### Output

Output "YES" if the graph is bipartite, "NO" otherwise.

### Example

bipartite.in	bipartite.out
4 4	YES

1 2	
1 3	
2 4	
4 2	
3 3	NO
1 2	
2 3	
3 1	

No file chosen

Accepted

You have used 4 of 200 attempts

### Discussion

**Topic:** 08: 4th Week Problems / Bipartite Graph

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