Baltic OI '11 P8 - Tree Mirroring

Time limit: 1.0s **Memory limit:** 256M

Baltic Olympiad in Informatics: 2011 Day 2, Problem 4

Let T be a rooted tree (a connected undirected acyclic graph), and let S be a perfect copy of T. Construct a new graph by taking the union of T and S, and merging the corresponding leaf nodes (but never the root). We call such a graph a tree-mirrored graph.

Write a program that determines if an arbitrary undirected connected graph is a tree-mirrored graph.

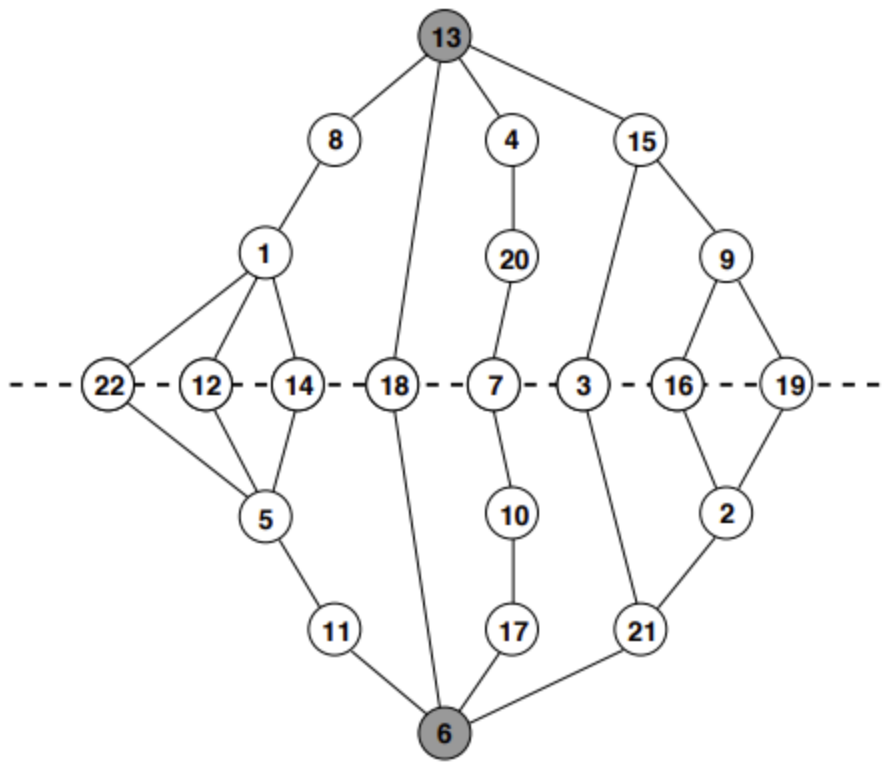

Figure 1: An example of a tree-mirrored graph. The figure corresponds to the third example test case.

Constraints

$3 \leq N, M \leq 10^5$

Subtask 1 [30%]

$3 \leq N, M \leq 300$

Subtask 2 [30%]

$3 \leq N, M \leq 3\,500$

Subtask 3 [40%]

No additional constraints.

Input Specification

The first line of input contains two space-separated integers N and M, the number of vertices and edges of a graph G.

The vertices in G are labeled from 1 to N. The following M lines describe the edges. Each such line contains two space-separated integers x and y $(x \neq y; 1 \leq x, y \leq N)$, describing one bidirectional edge. There will be at most one edge between any pair of vertices.

Output Specification

The first and only line of output should contain the string `YES` if the graph G is a tree-mirrored graph, and `NO` otherwise.

Sample Input 1

```
7 7
1 2
2 3
3 4
4 5
5 6
6 7
7 1
```

Sample Output 1

```
NO
```

Sample Input 2

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

Sample Output 2

```
YES
```

Sample Input 3

```
22 28
13 8
8 1
1 22
1 12
1 14
13 18
13 4
4 20
20 7
13 15
15 3
15 9
9 16
9 19
22 5
12 5
14 5
5 11
11 6
18 6
7 10
10 17
17 6
3 21
21 6
16 2
19 2
2 21
```

Sample Output 3

```
YES
```

Explanation for Sample 3

The last example input corresponds to the graph in **Figure 1**.