UVa Online Judge

1198 The Geodetic Set Problem

Let $G = (V, E)$ be a connected graph without loops and multiple edges, where V and E are the vertex and edge, respectively, sets of G. For any two vertices $u, v \in V$, the *distance* between vertices u and v in G is the number of edges in a shortest $u - v$ path. A shortest path between u and v is called a $u - v$ *geodesic*. Let $I(u, v)$ denote the set of vertices such that a vertex is in $I(u, v)$ if and only if it is in some $u - v$ geodesic of G and, for a set $S \subseteq V$, $I(S) = \bigcup_{u,v \in S} I(u, v)$. A vertex set D in graph G is called a *geodetic set* if $I(D) = V$. The *geodetic set problem* is to verify whether D is a geodetic set or not.

We use Figure 3 as an example. In Figure 3, $I(2, 5) = \{2, 3, 4, 5\}$ since there are two shortest paths between vertices 2 and 5. We can see that vertices 3 and 4 are lying on one of these two shortest paths respectively. However, $I(2, 5)$ is not a geodetic set since $I(2, 5) \neq V$. Vertex set $\{1, 2, 3, 4, 5\}$ is intuitively a geodetic set of G. Vertex set $D = \{1, 2, 5\}$ is also a geodetic set of G since vertex 3 (respectively, vertex 4) is in the shortest path between vertices 1 and 5 (respectively, vertices 2 and 5). Thus, $I(D) = V$. Besides, vertex sets $\{1, 3, 4\}$ and $\{1, 4, 5\}$ are also geodetic sets. However, $D = \{3, 4, 5\}$ is not a geodetic set since vertex 1 is not in $I(D)$.

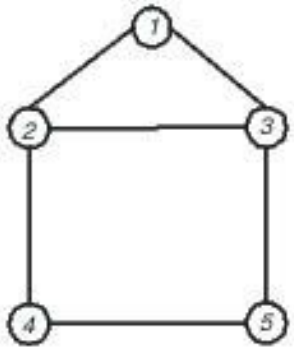

Figure 3: A graph G.

Input

The input file consists of a given graph and several test cases. The first line contains an integer n indicating the number of vertices in the given graph, where $2 \leq n \leq 40$. The vertices of a graph are labeled from 1 to n. Each vertex has a distinct label. The following n lines represent the adjacent vertices of vertex i, $i = 1, 2, \ldots, n$. For example, the second line of the sample input indicates that vertex 1 is adjacent with vertices 2 and 3. Note that any two integers in each line are separated by at least one space. After these n lines, there is a line which contains the number of test cases. Each test case is shown in one line and represents a given subset D of vertices. You have to determine whether D is a geodetic set or not.

Output

For each test case, output '`yes`' in one line if it is a geodetic set or '`no`' otherwise.

Sample Input

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

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

Sample Output

```
yes
yes
no
yes
yes
no
```