3761 Minimum Spanning Tree

Given graph G which is a connected, weighted, undirected graph, a *spanning tree* T is a subgraph of G which is: (1) a tree that (2) connects all the vertices of G together. The *weight* of a spanning tree is the sum of the weights of the edges in that tree. A *minimum spanning tree* is a spanning tree: (3) whose weight is less than or equal to the weight of every other spanning tree.

Write a program that determines if a given tree T is a Minimum Spanning Tree for a given graph G.

Input

Your program will be tested on one or more test cases. For each test case you'll be given a graph G and one or more trees to test. The first line of a test case will have a single positive integer n denoting the number of vertices in G (where $1 < n \leq 1000$). The vertices are numbered starting from 1. The next $(n-1)$ lines specify the upper triangle of the graph's adjacency matrix as seen here:

$$\begin{array}{llllll} W_{1,2} & W_{1,3} & \dots & W_{1,n-1} & W_{1,n} \\ W_{2,3} & W_{2,4} & \dots & W_{2,n} & \\ \vdots & & & & \\ W_{n-1,n} & & & & \end{array}$$

where $W_{i,j}$ is the weight of the edge between vertices i and j. $W_{i,j} = 0$ iff there is no edge between i and j. Note that $0 \leq W_{i,j} \leq 1000$

Following the graph specification, a test case will specify a single positive number Q on a separate line where $0 < Q \leq 1000$. Q denotes the number of trees to test on the given graph.

Each tree either consists of a single vertex, given by its number, or is specified as:

$(R\ T_1\ T_2\ \dots\ T_c)$

where R is the number of the vertex at the root and $T_1, \dots, T_c$ (where $0 < c \leq 1000$) are the sub-trees of R specified recursively.

The last line of the input file will have a single zero.

Output

For each query, write the result on a separate line using the following format:

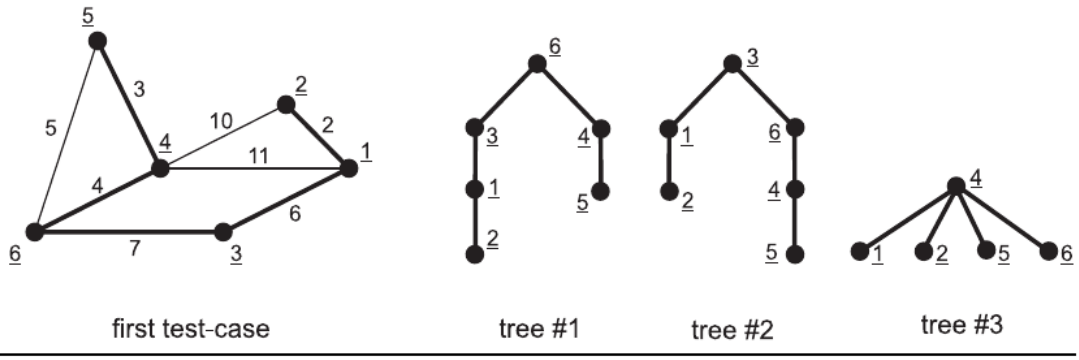
$a.b.\sqcup result$

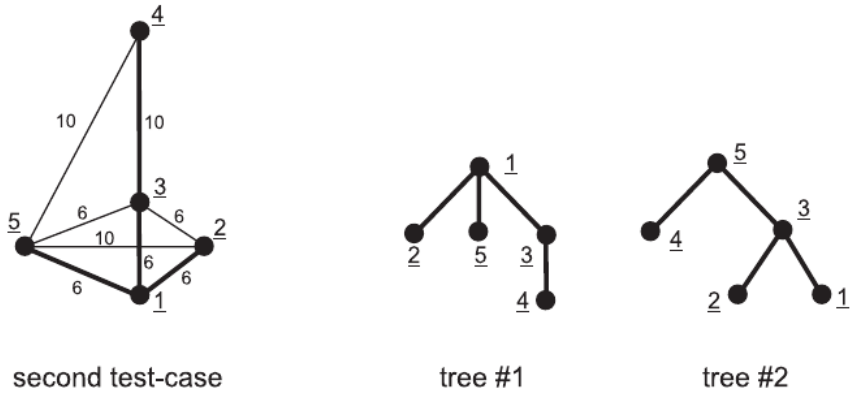
where a is the test case number (starting at 1,) and b is the query number *within* this test case (again starting at 1.) *result* is either '`YES`' or '`NO`' indicating if the tree is a minimum spanning tree or not.

Sample Illustration

The following figures illustrate the sample I/O. The top half is for the first test case, while the second test case is on the bottom.

In the graph, vertex numbers are underlined and the edges of a minimum spanning tree are drawn in thicker lines.





Sample Input

```
6
2  6 11 0 0
0 10  0 0
0  0  7
3  4
5
3
(6 (3 (1 2)) (4 5))
(3 (1 2) (6 (4 5)))
(4 1 2 5 6)
5
 6 6  0 6
 6 0 10
10 6
10
2
(1 2 5 (3 4))
(5 4 (3 2 1))
0
```

Output

```
1.1 YES
1.2 YES
1.3 NO
2.1 YES
```

```
2.2 YES
```