

### F3. Tree of Life (hard)

time limit per test: 8 seconds  
memory limit per test: 256 megabytes  
input: standard input  
output: standard output

To add insult to injury, the zombies have taken all but two drawings from Heidi! Please help her recover the Tree of Life from only these two drawings.

#### Input

The input format is the same as in the medium version, except that now the bound on  $n$  is  $2 \leq n \leq 1000$  and that  $k = 2$ .

#### Output

The same as in the medium version.

#### Example

input
1 9 2 6 4 3 5 4 6 1 8 6 8 2 7 1 5 8 6 8 7 8 1 7 3 5 1
output
YES 2 1 3 1 5 4 6 5 7 6 8 5 9 8 1 4