

## F. One Node is Gone

time limit per test: 1 second  
memory limit per test: 256 megabytes  
input: standard input  
output: standard output

You have an integer  $n$ . Let's define following tree generation as *McDic's generation*:

1. Make a complete and full binary tree of  $2^n - 1$  vertices. Complete and full binary tree means a tree that exactly one vertex is a root, all leaves have the same depth (distance from the root), and all non-leaf nodes have exactly two child nodes.
2. Select a non-root vertex  $v$  from that binary tree.
3. Remove  $v$  from tree and make new edges between  $v$ 's parent and  $v$ 's direct children. If  $v$  has no children, then no new edges will be made.

You have a tree. Determine if this tree can be made by McDic's generation. If yes, then find the parent vertex of removed vertex in tree.

### Input

The first line contains integer  $n$  ( $2 \leq n \leq 17$ ).

The  $i$ -th of the next  $2^n - 3$  lines contains two integers  $a_i$  and  $b_i$  ( $1 \leq a_i < b_i \leq 2^n - 2$ ) — meaning there is an edge between  $a_i$  and  $b_i$ . It is guaranteed that the given edges form a tree.

### Output

Print two lines.

In the first line, print a single integer — the number of answers. If given tree cannot be made by McDic's generation, then print 0.

In the second line, print all possible answers in ascending order, separated by spaces. If the given tree cannot be made by McDic's generation, then don't print anything.

### Examples

input

4  
1 2  
1 3  
2 4  
2 5  
3 6  
3 13  
3 14  
4 7  
4 8  
5 9  
5 10  
6 11  
6 12

Copy

output

1  
3

Copy

input

2  
1 2

Copy

output

2  
1 2

Copy

input

Copy

Codeforces Round #589 (Div. 2)

Finished

Practice

→ Virtual participation

Virtual contest is a way to take part in past contest, as close as possible to participation on time. It is supported only ICPC mode for virtual contests. If you've seen these problems, a virtual contest is not for you - solve these problems in the archive. If you just want to solve some problem from a contest, a virtual contest is not for you - solve this problem in the archive. Never use someone else's code, read the tutorials or communicate with other person during a virtual contest.

Start virtual contest

→ Practice

You are registered for practice. You can solve problems unofficially. Results can be found in the contest status and in the bottom of standings.

→ Clone Contest to Mashup

You can clone this contest to a mashup.

Clone Contest

→ Submit?

Language: GNU G++11 5.1.0

Choose file: 选择文件 未选择任何文件

Be careful: there is 50 points penalty for submission which fails the pretests or resubmission (except failure on the first test, denial of judgement or similar verdicts). "Passed pretests" submission verdict doesn't guarantee that the solution is absolutely correct and it will pass system tests.

Submit

→ Problem tags

constructive algorithms implementation

trees \*2700

No tag edit access

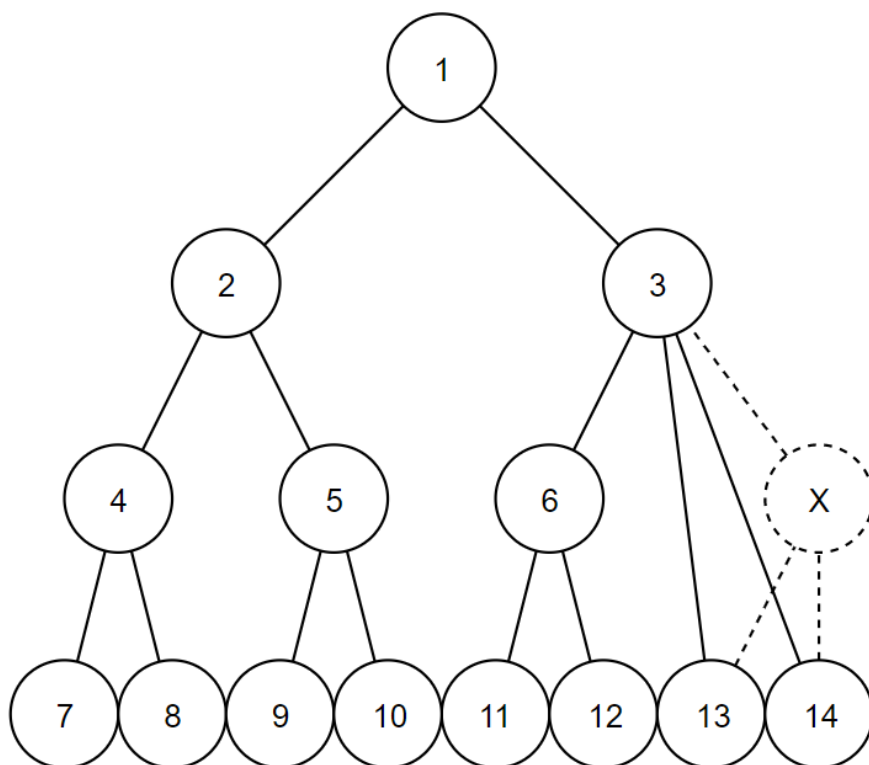
→ Contest materials

• Announcement (en)

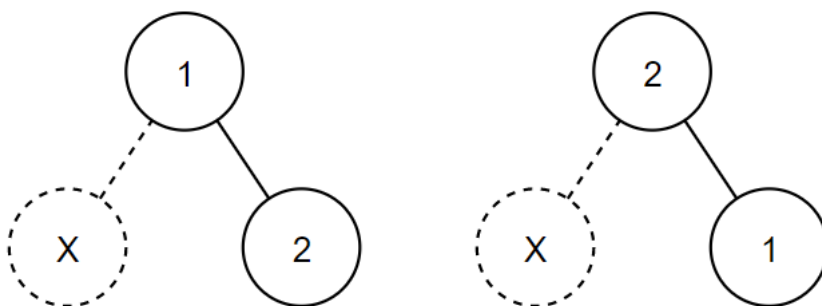
0



In the first example, 3 is the only possible answer.



In the second example, there are 2 possible answers.



In the third example, the tree can't be generated by McDic's generation.

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