Programming task Server

Memory limit: 5 MB
Time limit: 0.5 second
Input file: `server.in`
Output file: `server.out`

Description

Behind thirty-nine mountains and thirty-nine seas was a country that had managed very well without computers until now. But one fine day they received a shipment from a certain Bill with computers, the number of which did not exceed 20000. They also sent a specialist named Net, whose task was to create a computer network between all the computers. As it was promised to bring free Vista (there was such an OS; "vista" is a chiken in Latvian) to every computer, the citizens of the country agreed to the creation of a computer network. Why not agree, if in the worst case, you will be able to eat a freely given bird, even though it is rumored that the Vista is already old and not edible at all?

Net immediately went to work. However, after a while the work stopped because he found that there were not enough network cables. The way out was found by connecting computers in such a way that each computer can reach any other over the network, using other computers as intermediaries if necessary. Due to the lack of network cables, the Net's network was built very sparingly - there was only one path from each computer to any other computer.

Software was installed on each computer, which 1 millisecond after receiving data from one computer, sent this data to all other directly connected computers. Each recipient-computer assessed for itself whether the data sent concerned it. If the data has already been to the particular computer, then the computer ignores repeated data arrivals.

It remained only to solve the problem - which computer to configure as a server, so that the data sent by the server reaches all computers in the shortest possible time. Net felt so tired after conneting computers that he could no longer cope with the task. Help Net find out which computers can be chosen as the server and how many milliseconds it will take for all computers to receive the server message.

If the number of computers is n from the interval [1..20000], then each computer is assigned a unique number from 1 to n. The input data is always correct according to the specification.

Input:

The first line contains the number of computers sent.

The following lines give all direct connections between computers.Each line contains exactly two numbers that identify directly connected computers.

The last line, which signals the end of the input data, contains two 0's.

Output:

The first line contains the minimum guaranteed time in which the server message can be received by all computers on the network.

The second line contains all computer numbers that can serve as servers. Print computer numbers in ascending order.

Example:

The content of input file `server.in`:

```
5
5 4
1 2
4 3
1 4
0 0
```

The content of output file `server.out`:

```
2
1 4
```