

Write a program that takes as input a directed graph (in the format described below) and outputs (I) 'YES' or 'NO' depending on whether the graph is a DAG, and, (II) in case it is a DAG, it outputs a linear ordering of the DAG, and, (III) in case it is a DAG, outputs the length of the longest path in the DAG starting from vertex 1.

The input will consist of several lines and will be given either as a text file or on the command prompt. The first line will be a positive integer n . This is the number of vertices of the graph - the names of the vertices will be $1, 2, 3, \dots, n$. The next few lines will contain the edges of the graph as i, j where $1 \leq i \leq n$ and $1 \leq j \leq n$ and $i \neq j$. You can rest assured that the input will be in the correct format and as expected. A valid input could be for example:

```
5
1,2
3,4
3,1
```

For the input above, one possible correct output is:

```
YES
3, 1, 4, 2, 5
1
```

An example of an incorrect input that you will never see is:

```
5
0, 1 a, 1
```