Comp 7712 (Algorithms/Problem Solving) Fall 2018. Programming Assignment 2.

Submission: This assignment is due on Th Oct 25th. Please note:

1. Each student must submit his or her own assignment.
2. You must write code in either C, C++, Java or Python. Moreover, code should be put in a folder of its own with a README file on how to run the code and test it. It must strictly adhere to the Input/Output format described in the problem below. To submit, upload the zipped folder using ecourseware by the due date.

Problem 1[100 pts] 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 $1, 2, 3, \ldots, n$. 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
```