

## 1 Lost in wonderland

### 1.1 Problem

You and a friend named Jacob planned out a trip to wonderland with ( $2 \leq N \leq 10^9$ ) friends. You guys got to wonderland and were exploring the park, but suddenly you find out that Jacob's dog wants to come. You've got to tell Jacob that his doggo wants to come! Now Jacob does not have his phone with him, so you've got to play a game of broken telephone to tell Jacob that his doggo wants to come. You know who is connected to who (your input), and you'll need to find the shortest path the information can take through them.

### 1.2 Input Specfication

The first line will contain interger ( $2 \leq N \leq 10^9$ ) which represents the amount of connections

The next  $N$  lines will contain two space seperated strings of characters, each of which are  $2 \leq M \leq 200$  characters. If two strings are on the same line, then the two people who have those names are connected.

### 1.3 Output Specification

The output will consist of either the word 'IMPOSSIBLE' in all caps, if telling Jacob is impossible, or the length of the shortest path if it is impossible.

## 2 Mosquutio Problem

### 2.1 Problem

You decided to go on a trip to Algonquin park with your friends over the summer. But this summer seems to have quite a few mosquitos. Now you and your friends love biology, so you decide to capture some mosquitos  $0 \leq 10^6$  and analyse how old they are, so you can figrue out how many mosquitos will result form them.

In addition one of your friends knows that these types of mosquitos are special, and don't die. Infact they reproduce every 5 days! When they reproduce they give birth to 2 more mosquitos!

Your job is to write a program which can figure out how many mosquitos will be flying around in  $1 \leq M \leq 10^6$  days.

### 2.2 Input specification

The first line contains two integers