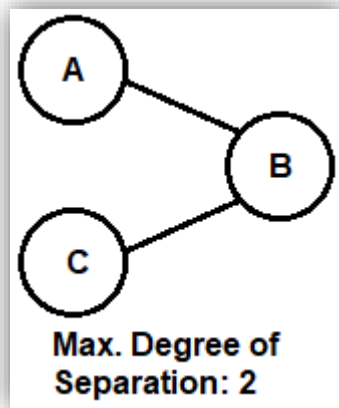


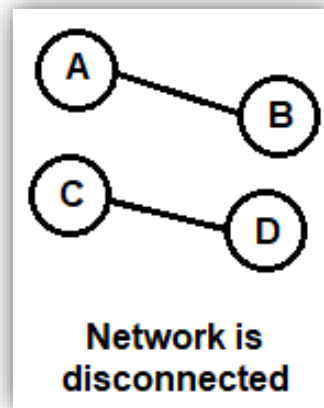
Degrees of Separation:

In this world, it is speculated that every person on earth is related to every other person by no more than 6 degrees of separation. Given such theorem, it is asked to write a program to find the maximum degree of separation in a network of people.

For any two people, the maximum degree of separation is the number of relationships that must be traversed in order to connect them. If there is at least one person who can't be connected to any other person, then the network is disconnected.



Example 1



Example 2

In example 1, as B must be traversed to connect A with C, the maximum degree of separation is 2. In example 2, as there is no possible way to connect A with C or D, the network is disconnected.

The program required must, given a series of names in pairs, determine the maximum degree of separation between them all.

Client:	NA
User:	NA
Environment:	<ul style="list-style-type: none"> - A network of people is the combination of different connections between different people. - A connection is any possible relation between a pair of people. - A degree of separation is the number of people that must be traversed in order to connect one person with other. - A maximum degree of separation of a network is the maximum degree of separation possible between two people in a network of people. - The input of the program consists of two parts: The first one being two integer numbers, P and R, or the number of people and the number of relationships respectively. - $2 \leq P \leq 50$; $R \geq 1$ - Second part of the input is a series of R pair of names, representing the relationships between all the people in the network. - This input continues until both P and R equal 0. - Output is the maximum degree of separation in the network created by the inputs.

Requirement Specification:

The following is the specification of the requirements for the program that solves the problem specified before:

Name:	FR1: Read input
Summary:	<p>The program must read the input of the problem. It will be, first, a pair of integers P and R; the former being the number of people in the network; and the latter being the number of relations in the network.</p> <p>Input is then followed by R pairs of names, representing each of the relationships in the network.</p> <p>This input is repeated until P and R are both 0.</p>
Input:	Two integers, P and R, followed by a String of R pair of numbers.
Output:	The program reads and interprets the inputs of the problem, creating all the networks successfully inputted to the program.

Name:	NFR1: Calculate maximum degree of separation.
Summary:	Given the relationships in a network of people, the program must be able to calculate the maximum degree of separation in it.
Input:	The network of people read by the input.
Output:	The maximum degree of separation in such network.

Name:	FR2: Show the maximum degree of separation.
Summary:	After calculating the maximum degree of separation in a network, the program must show the result. If a network is disconnected, the output is "DISCONNECTED"
Input:	The degree of separation of all networks in the program.
Output:	A String with the following format: "Network x: y", where x is the number of the network and y is either the maximum degree of separation in it, or "DISCONNECTED".