B-1- Mathematics

B-MAT-430

302separation

6 degrees of Facebook separation

v1.0

EPITECH.
L'ECOLE DE L'INNOVATION ET DE L'EXPERTISE INFORMATIQUE

302separation

6 degrees of Facebook separation

binary name:	302separation
repository name:	302separation
repository rights:	ramassage-tek
language:	C, C++, perl 5, python 3.5, ruby 2.3, php 5.5, bash 4
group size:	1-2
compilation:	via Makefile, including re, clean and fclean rules

- Your repository must contain the totality of your source files, but no useless files (binary, temp files, obj files,...).
- All the bonus files (including a potential specific Makefile) should be in a directory named *bonus*.
- Error messages have to be written on the error output, and the program should then exit with the 84 error code (0 if there is no error).

Subject

In 1929, a Hungarian named Frigyes Karinthy established the theory of six degrees of separation: each person in the world can be connected to any other person via a string of individual relationships, comprising a maximum of five other links.
Today, social networks allow us an experimental familiarity with the degree of separation between two individuals.
Starting with a file that contains the friendship link between two different Facebook accounts, the goal of this project is to display the degree of separation between these two people.

In order to do this we will use a graphical represenation and display the following:

- the list of people in alphabetical order (the order that will be used to build the matrices),
- the adjacency matrix,
- the matrix of the size of the shortest paths, inferior lengths or equal to n.

If two names are given as argument to the program, we will display the degree of separation between both people, or -1 if they are not connected.

We will consider that the friendships are reciprocal (if A is friends with B, B is obviously friends with A)

Prototyping

```
Terminal
~/B-MAT-430> ./302separation file n
```

file contains the list of Facebook connections in the form of *XX is friends with YY*
n is the maximum size of the paths

```
Terminal
~/B-MAT-430> ./302separation file p1 p2
```

file contains the list of Facebook connections in the form of *XX is friends with YY*
$p1$ and $p2$ are names of people in the file

Bonus

- display the link connecting the people
- graphic visualization of the connections between people

Examples

```
Terminal
~/B-MAT-430> cat example
Jesus is friends with Chuck Norris
Cindy Crawford is friends with Nicole Kidman
V is friends with Barack Obama
Chuck Norris is friends with Barack Obama
V is friends with François Hollande
Penelope Cruiz is friends with Tom Cruise
Nicole Kidman is friends with Tom Cruise
Katie Holmes is friends with Tom Cruise
Sim is friends with Lara Croft
Sim is friends with Chuck Norris
Lara Croft is friends with V
Yvette Horner is friends with Sim
François Hollande is friends with Barack Obama
Sim is friends with Jesus
Tom Cruise is friends with Barack Obama
```

```
Terminal
~/B-MAT-430> ./302separation example "Yvette Horner" "Barack Obama"
degree of separation between Yvette Horner and Barack Obama:  3
```

```
Terminal
~/B-MAT-430> ./302separation example "Yvette Horner" "Yvette Horner"
degree of separation between Yvette Horner and Yvette Horner:  0
```

```
Terminal
~/B-MAT-430> ./302separation example "Yvette Horner" "Mike Tyson"
degree of separation between Yvette Horner and Mike Tyson:  -1
```

Terminal

```
~/B-MAT-430> ./302separation exemple 3
Barack Obama
Chuck Norris
Cindy Crawford
François Hollande
Jesus
Katie Holmes
Lara Croft
Nicole Kidman
Penelope Cruiz
Sim
Tom Cruise
V
Yvette Horner

0 1 0 1 0 0 0 0 0 0 1 1 0
1 0 0 0 1 0 0 0 0 1 0 0 0
0 0 0 0 0 0 0 1 0 0 0 0 0
1 0 0 0 0 0 0 0 0 0 0 1 0
0 1 0 0 0 0 0 0 0 1 0 0 0
0 0 0 0 0 0 0 0 0 0 1 0 0
0 0 0 0 0 0 0 0 0 0 1 0 1 0
0 0 1 0 0 0 0 0 0 0 1 0 0
0 0 0 0 0 0 0 0 0 0 1 0 0
0 1 0 0 1 0 1 0 0 0 0 0 1
1 0 0 0 0 1 0 1 1 0 0 0 0
1 0 0 1 0 0 1 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 1 0 0 0

0 1 3 1 2 2 2 2 2 2 1 1 3
1 0 0 2 1 3 2 3 3 1 2 2 2
3 0 0 0 0 3 0 1 3 0 2 0 0
1 2 0 0 3 3 2 3 3 3 2 1 0
2 1 0 3 0 0 2 0 0 1 3 3 2
2 3 3 3 0 0 0 2 2 0 1 3 0
2 2 0 2 2 0 0 0 0 1 3 1 2
2 3 1 3 0 2 0 0 2 0 1 3 0
2 3 3 3 0 2 0 2 0 0 1 3 0
2 1 0 3 1 0 1 0 0 0 3 2 1
1 2 2 2 3 1 3 1 1 3 0 2 0
1 2 0 1 3 3 1 3 3 2 2 0 3
3 2 0 0 2 0 2 0 0 1 0 3 0
```