

Software Engineering Project 1

(Comp 10050)

Assignment 1 – Facebook Friends Suggestions

Aim: to create a program that 1) receives as input a list of facebook users and their friends and 2) provides friends suggestions for a specific user given as input.

You are expected to perform this assignment individually

A. Detailed Specification

The objective for this assignment is to create a program that:

- 1) Asks the user to provide as input from the command line the name of a Facebook user. At most 6 users can be provided as input. For each user, at most 4 friends can be provided as input. To indicate you do not want to add more users or more friends of a user, you can press “Enter” or a character of your choice.

For example, this is how the console should ask the users to provide the singers/groups names and their songs as input. Note that command line output is indicated in black while the command line input is indicated in blu.

Insert a Facebook User:

Mark Zuckerberg

Insert friend 1 for Mark Zuckerberg

Jeff Bezos

Insert friend 2 for Mark Zuckerberg

Hillary Clinton

Insert friend 3 for Mark Zuckerberg

George Orwell

Insert a Facebook User:

Jeff Bezos

Insert friend 1 for Jeff Bezos

Alexa Jones

Insert friend 2 for Jeff Bezos

Mark Zuckerberg

Insert friend 3 for Jeff Bezos

George Orwell

Insert friend 4 for Jeff Bezos

Edward Snowden

Insert a Facebook User:

Alexa Jones

Insert friend 1 for Alexa Jones

Jeff Bezos

Insert friend 2 for Alexa Jones

Michelle Obama

Insert a Facebook User:

George Orwell

Insert friend 1 for George Orwell:

Jeff Bezos

Insert friend 2 for George Orwell:

Mark Zuckerberg

Insert a Facebook User:

Edward Snowden

Insert friend 1 for Edward Snowden:

Vladimir Putin

Insert friend 2 for Edward Snowden:

Jeff Bezos

Insert a Facebook User:

Julian Assange

Insert friend 1 for Julian Assange:

- 2) Then the program should ask the user to input the number of the facebook user for which it should provide friend suggestions wants to get friends suggestions

Input the Facebook user to which you want to provide friends suggestions:

- (1) Mark Zuckerberg
- (2) Jeff Bezos
- (3) Alexa Jones
- (4) George Orwell
- (5) Edward Snowden
- (6) Julian Assange

- 3) The program should identify at most 2 friends suggestions for the user selected at step 2. Suggested friends cannot already be friends of the selected user and should have the biggest number of friends among all possible friends suggestions. If two or more friends suggestions have the same number of friends the smallest ones in alphabetical order will be selected.

If the user selects Jeff Bezos (i.e. inputs 2 at step 2), the program output will be

Suggested Friends for Jeff Bezos:
Julian Assange

If the user selects Julian Assange (i.e. inputs 6 at step 2), the program output will be

Suggested Friends for Julian Assange:
Jeff Bezos
Alexa Jones

If the user selects Edward Snowden (i.e. inputs 5 at step 2), the program output will be

Suggested Friends for Edward Snowden:
Alexa Jones
Mark Zuckerberg

If the user selects Mark Zuckerberg (i.e. inputs 1 at step 2), the program output will be

Suggested Friends for Mark Zuckerberg:
Alexa Jones
Edward Snowden

Requirements:

1. Facebook users should be sorted depending on the number of their friends (from the biggest to the smaller). If 2 users have the same number of friends they will be sorted alphabetically.
2. To perform the sorting, avoid adopting inefficient algorithms, such as bubblesort.
3. Your program should work for other lists of Facebook users provided as input.

Code Design Requirements:

- Comment your code, where necessary.
- Use functions where you can.
- Separate your code into independent modules.

Design Hints:

1. Start by getting the input of the Facebook users and their friends working
2. Remember that strings cannot be the target of an assignment (=), you have to use `strcpy`.
3. Strings cannot be compared using `==` or `<` so you need to use `strcmp` or `strncmp`.
4. Google `strcpy`, `strcmp`, `strncmp`, and `strstr`. Get used to one of the standard online resources, e.g. https://en.wikibooks.org/wiki/C_Programming/C_Reference/string.h/strcpy
5. For sorting consider the Insertion sort or the Quicksort (pointers to them will be provided in class).

Submission:

- Submit two items through Brightspace,
 - an archive file (e.g., .zip or .tar.gz) containing your source module
 - a text file (.doc or .pdf) providing implementation details and comments on the design decisions you have made.
 - What function did you use to read the input from the command line? Why?
 - What algorithm did you choose to sort the users? Why?
 - How did you implement the algorithm for identifying friends suggestions?

Evaluation Criteria

A grade will be given according to the following criteria

- The code is well commented and appropriately divided into modules (10%)
- Input from command line is read correctly. (15%)
- The submitted text file describes your design choices appropriately (5%)
- The program ensures that suggested friends are not already friends with the selected user (20%)
- The program ensures that suggested friends are ordered depending on the highest number of users (20%)
- The program ensures that suggested friends are also ordered alphabetically (20%)
- An optimal algorithm is used to perform the sorting operations (10%)