Introduction to C language (NF05)
— project 2020-2021 —

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Snapch-UTT

Instructions

— Work in monome or in binome.
— Report (PDF format) + code + executable files are to be included in the project file of the TD group in which you will make your presentation. If you are in binomial, think about indicating both names.
— The presentation (power point + execution) will take place during the TD sessions.
— The code will have to be commented in full. To do this, you must use the Doxygen tool [1] to manage the documentation.
— Recommendations : The C language is very informative on the internet, do a search before contacting a friend or professor.
— It is not allowed to take a code from someone otherwise you could be sanctioned.
— It is crucial to cite your references.

Report

The report must include :

1. An introduction that clearly states the topic, as well as the plan of the document.

1. www.doxygen.org

2. A part that describes the algorithms used (the operation and not the code).
3. The encountered problems and the solutions you have found.
4. An instruction manual for the program
5. A conclusion and perspectives to optimize your program.
6. An appendix that includes the commented code.

It is also requested to estimate the time required to complete the different parts of the code.

Required Work

With roughly 2.8 billion monthly active users, Facebook is the most popular social network worldwide. The platform was founded in 2004 by Mark Zuckerberg, along with his fellow roommates and students at Harvard College. It was first known as "TheFacebook" which started as a social network for university students across the Boston area and gradually the rest of the United States.

We want to create a similar network for UTT students that groups students from different fields and years of study in order to exchange ideas, projects and news. The main feature of a social network is following friends' feeds (Friends on Facebook, followers on Twitter, Instagram or Snapchat ...). We will start by implementing this feature.

We propose to model a simplified database of a social network. It consists of a set of users, each characterized by :

— Fullname : First name + last name.
— Age.
— Year of study.
— Field of study.
— City of residence.
— Areas of interests (1. sport, 2. cinema, 3. art, 4. health, 5. technology, 6. DIY, 7. cooking, 8. travel).

A user **X** can have a "follow" relationship with user **Y**, if **X** wants to follow news from **Y**. A user **X** then has a list of followers and a list of people he/she follows.

In order to implement this and simplify the search of users, we use an array of length 26 (an entry for each letter of the alphabet) and where each entry points to a list of users whose names start with the corresponding letter. Each element of this list is a structure

of users that contains its information and a pointer to a list of users that this user follows (this list should be ordered alphabetically).

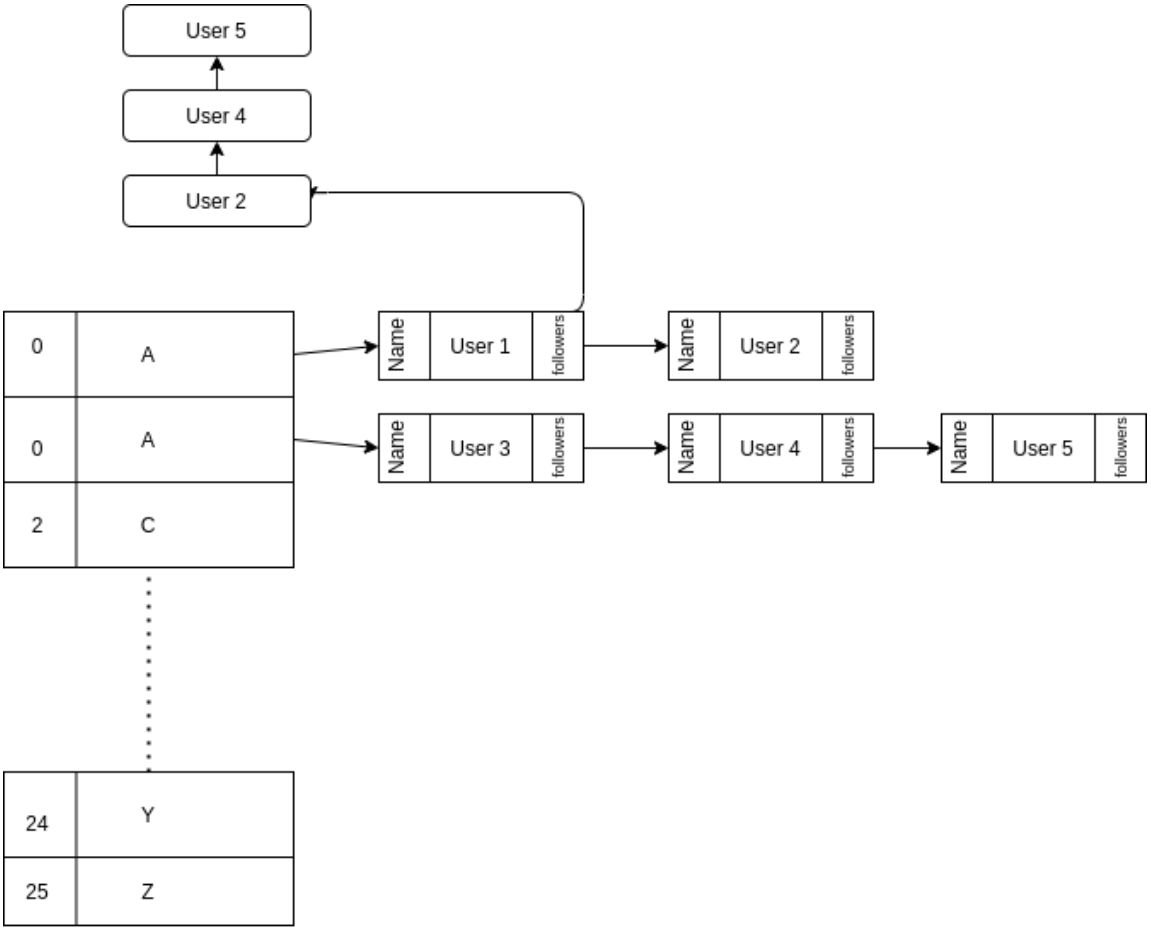

Fig. 1: Followers database structure

Write a program to manage users and followers of Snapch-UTT, this program implements the following features :

1. Insertion, deletion and updating users.
2. Adding followers to a user's followers list. (Follow feature)
3. Display all the followers of a certain user.
4. Search for users by name, field, year of study and areas of interest.

5. Propose a list of user suggestions for a certain user to follow, this list is limited to the top 5 users according to the following two criteria :

   — Mutual interests : These are the users with the most shared interests.
   — Mutual contacts : These are the users that repeat the most in the list of followers of the user's followers.

6. **BONUS FEATURE :** Export the list of users with their corresponding followers to a file and import it to continue the next time.

Recommendation

1. The program should contain a clear menu in order to test the different features of the social network.
2. The code should be well formatted (Indentation, good variable naming convention), commented and features split into functions and procedures.
3. The bonus feature will be rewarded according to the structure of the output file. Extra features proposed by the student are also rewarded.