

In the name of God



The final project of the data structure course - Dr. Fatemi

University of Isfahan

Faculty of Computer Engineering

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**The purpose of the project:**

The goal of this project is to implement a social network to link people together based on each person's skills. In this project, you should suggest to each of the selected users other people who are members of this social network to connect with each other (just like networks like LinkedIn that suggest people to follow).

**Project description:**

Now let's take a closer look at the project. Imagine you have a person with the following profile in your social network.

**General specifications:**

- User ID:1
- Name: Mohammad Kazem
- Surname: Harandi
- Date of birth:10/10/2013

**Specialized specifications:**

- University location: Isfahan University
- Field of study: Computer Engineering
- Workplace: a good place

### Personal specialties:

- Machine learning
- Java programming

### List of connections:

- Amir Ali Goli
- Reza Charakh
- Amir Ali Lotfi
- Golden Puria
- Zahra Masoumi

Pay attention that in the input file, the list of connections is a list of IDs of people.

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As you can see, each person has four fields that include general information, specialized information, specializations, and his connections. Now, based on the connections of each connection, you should offer that target person (for example, Kazem in this example) a series of connections of its connections.

**Important note: only first-degree connections are not considered, and up to five degrees of these connections must be checked!**

The above important point is probably a bit confusing for you, so let's explore further together

Suppose, Kazem has a connection named Amir Ali, who also has a connection named Ehsan, and Ehsan has a connection named Kambiz. Now we can say that Kambyz is connected to Kazem with two mediators, which means that the degree of Kambyz for Kazem is three.

In simpler terms, we can say:



Important note: Now you have to check up to five degrees to suggest people. If a person has different degrees with the person (in this example, Kazem) through different connections, the lowest degree is considered.

For example, consider a person named Alireza. If Alireza is both Amir Ali's connection and Ehsan's connection, to find Alireza's degree relative to Kazem, we must consider the lowest degree. That is, let's consider 2.

Now you have to suggest people with the closest similarity to the target person. This proposal should not only be by browsing connections, and other things such as people's specialties have a very high priority. Use the following prioritization to make an offer.

1. Field of study
2. University
3. Personal specialties
4. Location
5. The degree of the person in relation to the target person (for example, the degree of Alireza in relation to Kazem was 2)
6. Number of shared connections

In fact, you should consider a weight for each of the features and based on that, determine the priority level to offer.

Give you a file it contains the information of persons given after reading the json information file. The ID of one of the people is given as input, and your program must, jsonSuggest 20 people to connect in order of priority. (To read file information json use ready-made libraries). These files are placed in the repository related to this project.

### **Project delivery:**

The purpose of this project is to print the list of your suggestions to the target person (note that the ID of the target person is given as an input and your program must be able to create this suggestion list for each member of the network)

Your program must have a suitable user interface for the following:

- The possibility of registering new people in the social network and giving suggestions for connections. Becoming others according to skills and .... after registering
- The possibility of entering the user page
- View a user's profile (name, expertise, connections, etc.)
- View the entire list of users
- Ability to search for a user using name or ID
- Connecting people to each other
- Disconnection between two users

- to offer 20 more users to connect in order of priority
- Delete user account: This user's information should be completely deleted from the graph. For example, this user no longer exists in the list of other people's connections.

#### **Bonus section:**

- Other parts of a social network such as graphics, posts, comments, etc You can add to make your project more beautiful; But in terms of score, they have less weight compared to algorithmic capabilities.
- If you use the correct git and commits, you will get extra points too To create a repository, be sure to use the link placed in Quora and the lesson channel and then clone it.

#### **Implementation:**

Considering that the purpose of this project is to evaluate your information in the field of graphs, be sure to use graphs to build a network and also to navigate to find the degree of people (you must implement the graph data structure yourself).