

Data Structures and Algorithm Project

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Introduction

Most People in Ashesi University have a hard time making time to socialize and meet new people with similar interests. These people do not enjoy the experience of having new friends or building relationships or even finding business partners etc. The reason is that most people are busy, and people do not see it easy to start conversations with other people because they do not know if they have similar interests that they can build talks on and people are on the go every time. This problem robs people off their human nature and makes them disconnected from the rest of the community while the issue remains unnoticed. Hence the software Friend Finder, which is meant to help people find other people in Ashesi with similar interests based on search filters. Also provides them with brief information about the people they see, such as their hobbies and the place in the school that they prefer to spend their time always so they can meet up with these people and create some wonderful conversations and friendships.

Background

We live in the age of social media, where it is unusual for someone with access to the internet to not be a registered user on any form of social media. The world is more connected than ever, and meeting new people online has become the norm, from dating, making friends, playing online video games, content creation, and so on. In fact, according to Gilbert (2018) on Business Insider, there are on average 1.8 billion registered user logging into YouTube every month. It is safe to say being online is the new normal; a well-known fact today.

When it comes to making connections, many people occasionally meet others and make acquaintances whom they never get close to – whether this be online or offline – but may share a plethora of similar interests. Regarding the online space, there are a vast array

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of social media applications designed to create new connections between users, but few of them provide a service dedicated to helping a user build a relationship with other users found to have the same interests, hobbies, etc. Providing this service to people of all kinds is the motivation behind the creation of this application; to help people discover others with similar interests, in a way, a friend finder.

Approach

The primary goal of our project is to be able to help individuals find friends who shared their interest. To do this, we needed a way to establish connections between individuals, as well as a way to determine how similar two individuals are. To achieve this, our project included the implementation of two main components – A graph, and a similarity index calculator.

Just like all social networks, we needed a way to draw connections between users, and a graph was one way of doing this. Our graph consisted of vertices that contained user objects, as well as edges to connect users. We opted to use an undirected graph since we viewed friendship as mutual. This implies that, unlike social networks like Instagram where a connection between individuals must be established from both ends, a relationship from one object to another in our implementation creates a single two-way connection between the two objects. Our graph implementation includes several methods that facilitate the processes needed for the functionality of our project. One method out of these is our implementation of the Depth First Search, that allows us to restrict the depth of the search and uses an ArrayList to build up and return search results.

To achieve the goal of being able to determine how close two objects are, we implemented the *similarityIndex()* as a method of our user object which takes another user

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object as a parameter and returns an integer value that represents how similar the two objects are. This method is also used, when searching the graph, to return search results in order of priority.

Our project involves the use of several data structures. These structures include Graphs, Maps, Hash tables, Sets, ArrayLists, Priority Queues, etc.

Results

The results at the end of our work gave us an in-depth knowledge on how to implement both linear and non-linear data structures and merely combine these two to solve the problem in question. To test our solution, we created multiple user objects and inserted them into the graph. We then went ahead to use these objects to ensure that the different graph methods work. However, the limitations of approaches were first, we were unable to store the data from users using an online database, also, about the interests of users, we did not go into too much detail – the interests were grouped under general headings eg. sports, music and not the specific sport or music the person is interested in.

Conclusion

In summary, the main aim of the project was achieved, that is, to help people find friends based on how alike they are regarding their interests. Key findings from this project include;

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- Programs are built with multiple data structures or in simple terms, in using data structures to solve problems, the way and manner in which they are put together are essential.
- Creating Graphical User Interfaces also requires the use of data structures.

References

Gilbert, B. (2018, May 04). YouTube now has over 1.8 billion users every month, within spitting distance of Facebook's 2 billion. Retrieved from <https://www.businessinsider.com/youtube-user-statistics-2018-5>