Recommendation on social media using data structure

Introduction

One of the main functionalities offered by online social platforms such as Facebook and Twitter is the recommendation of new friends. This is achieved by utilizing various information about the users, but the main factor used for recommending a new friend to a user is how well these two users are connected. A social network such as Facebook can be represented as undirected graph such as the one shown in Figure 1. We can use the information contained in the graph to select the top candidate friends for a given user. There are many ways to do this, but we
will focus on two methods:

1. Popular users: In this method, we recommend the most popular users in the graph, that is nodes with the highest degrees (number of neighbors).

Example 1. If we want to recommend 4 new friends for user 3 using the popular users method, we recommend:

(a) User 8, which has degree 7.

(b) User 12, which has degree 5.

(c) User 4, which has degree 3.

(d) User 6, which has degree 3 (we break ties according to user ID).

2. Common neighbors: In this method, we recommend users who have the most common friends with the user.

Example 2. If we want to recommend 4 new friends for user 3 using the common neighbors method, we recommend:

(a) User 4, which has 2 common neighbors with 3, nodes 1 and 5.

(b) User 6, which has 2 common neighbors with 3, nodes 2 and 5.

(c) User 12, which has 1 common neighbor with 3, node 1.

(d) User 8, which has 0 common neighbors with 3 (we break ties according to user ID).

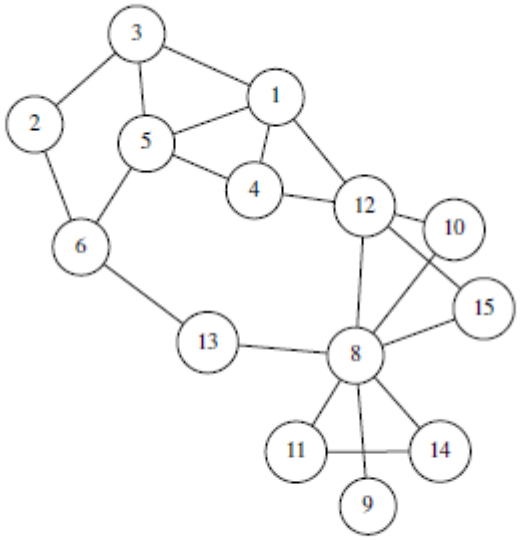

Figure 1: Example of a graph representing a social network.