

f) How good are the recommendations we make?

A. The first way to calculate the efficiency

To calculate the average, I first calculated the accuracy of prediction for each user X (i.e. number of friends that were truly formed during 2017-2018 / total number of new collaborations during 2017-2018), and then calculate the average among users.

i. Making recommendations using number of common friends

Average accuracy: 0.074049

ii. Making recommendations using Jaccard Index

Average accuracy: 0.048473

iii. Making recommendations using Adamic/Adar Index

Average accuracy: 0.066293

Based on the first way, we can say that using number of common friends to make recommendations can get a more accurate prediction because its accuracy score is highest.

B. The second way to calculate the efficiency

To calculate the average, I first find the rank of each newly formed collaboration of user X (i.e. the index where the new node Y appears in the recommendations list for X). After going through all authors, I sum up the ranks and divided by its length.

i. Making recommendations using number of common friends

Average rank: 101

ii. Making recommendations using Jaccard Index

Average rank: 103

iii. Making recommendations using Adamic/Adar Index

Average rank: 100

Based on the second way, we can say that using Adamic/Adar Index to make recommendations can get a better prediction because its average rank is smallest.