Assignment 3: CS765

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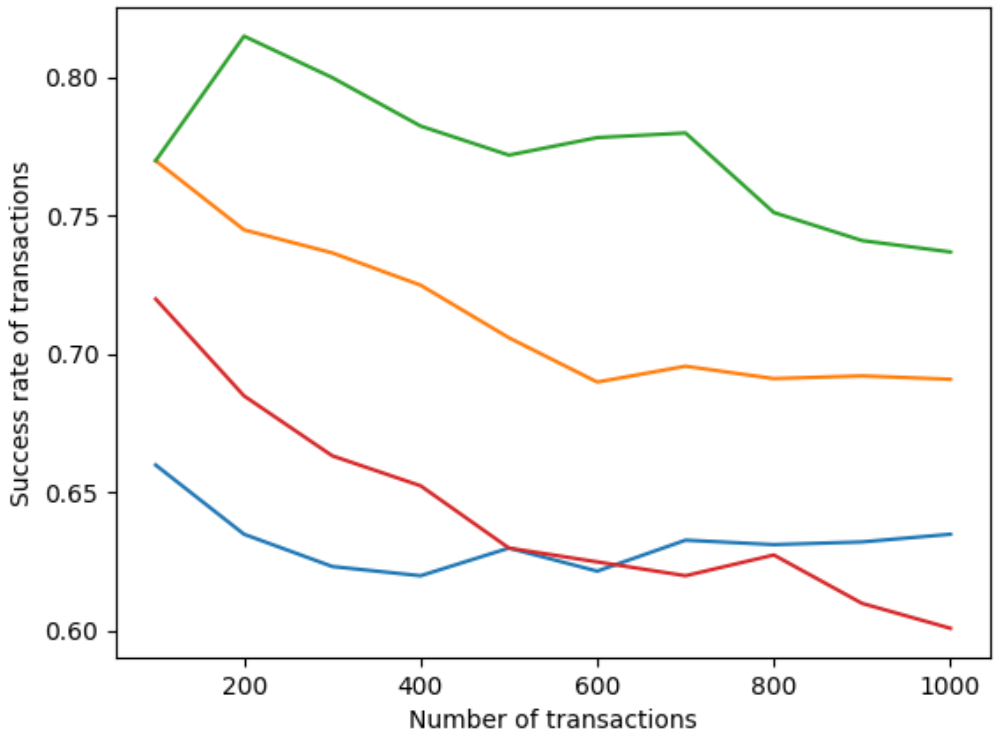
Results and Observations



Shown above is the graph between success rate of transactions plotted against total number of transactions sent. The various different lines correspond to different runs of the same experiment.

As we can directly observe, the success rate of transactions mildly decrease as more transactions are sent. This is because as more and more transactions are sent, the individual balances of users in joint account may become lopsided and hence lower than 1. This results in blocking of several paths of transfer if users want to send 1 unit of their balance (which is what we are doing in the simulation). This, hence, leads to a mild decreases in success rate. The effect is not profound as the network of users is sufficiently connected.

Design decisions

Time taken for simulation when sending each transaction individually is very high (more than **2 hours**). So we have send the transactions in bulk.

1. For registering users 100 transactions were sent simultaneously without waiting for any one of them to complete. Registration of one user does not depend on other.
2. Similarly creating a joint account between two user does not depend on any other pair. So all the transactions to create joint account were sent simultaneously.
3. For sending amount transactions, we have sent 25 transactions simultaneously and then waited for them to complete. This was done to replicate real life situation as, in real time more than 1 transactions happen simultaneously.

Doing this reduced the simulation time to few minutes (**less than 5 minutes**), which is very significant improvement.

The network of joint accounts between the users represents a scale-free network. This network was built using the algorithm provided in this resource. One such generated network is depicted below. Balances of joint accounts were sampled from a exponential distribution with mean 10 and divided equally among the users of the account.

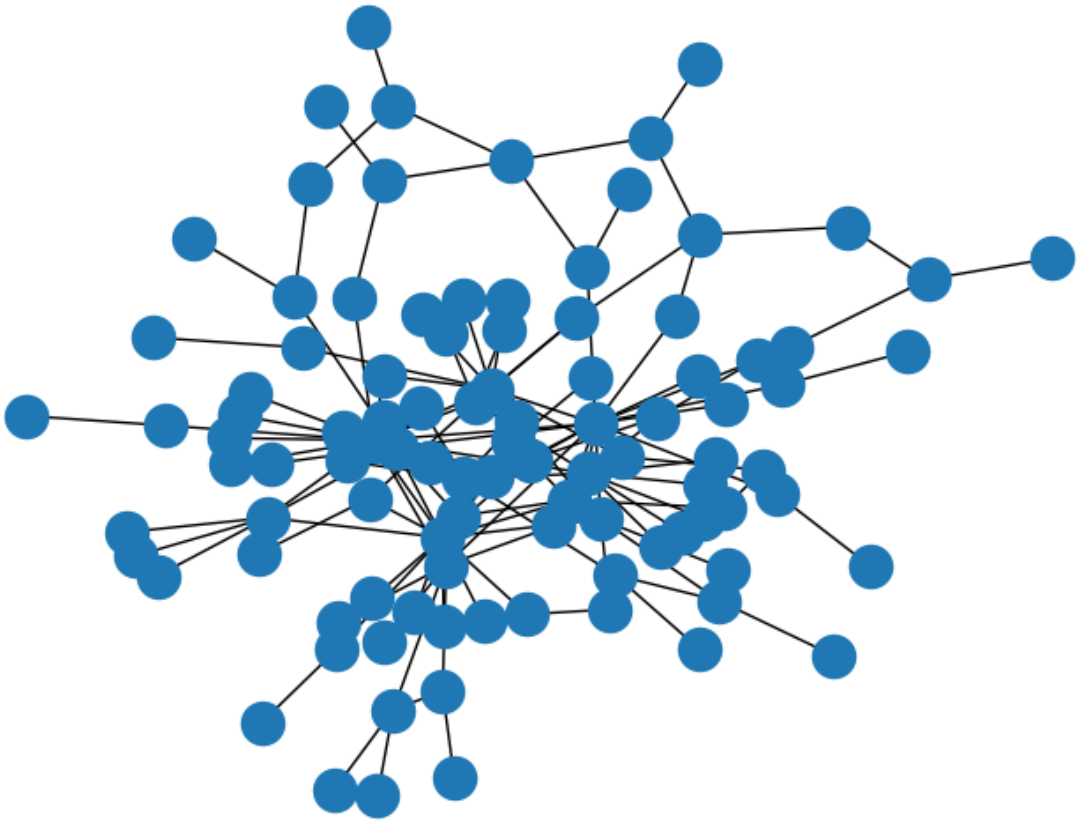


Figure 1: Network generated by joint accounts between users