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Second assignment report

Part 1

Conspiracy in Social Networks

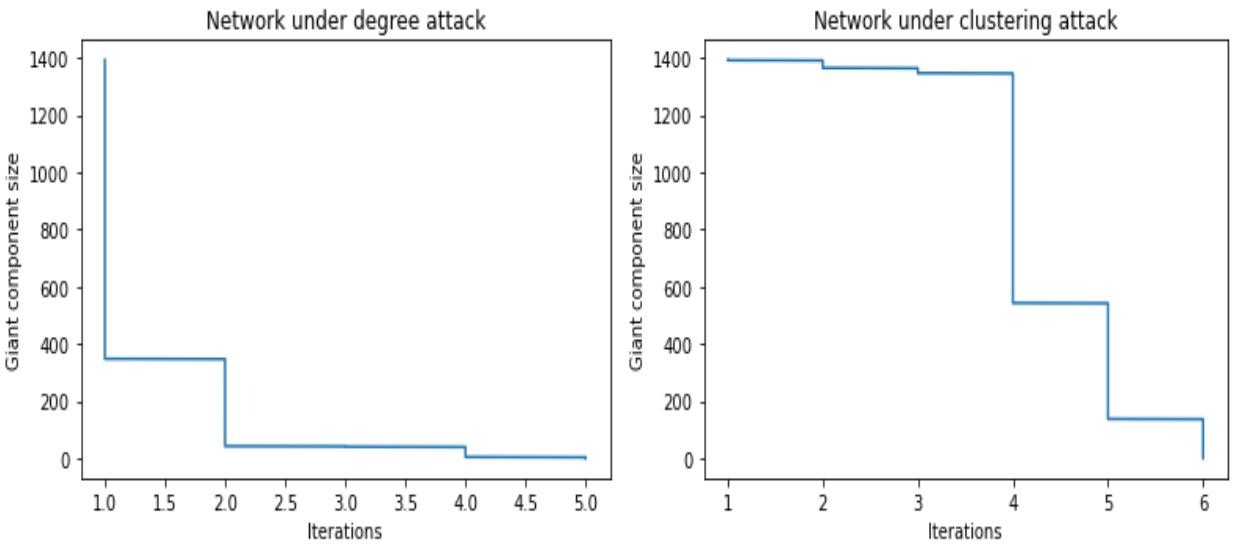
Both networks (A and B) have 10000 nodes.

Network A

I have calculated some metrics to understand how is the network.

```
giant component size = 1394
Density  = 0.00013449344934493449
Average Degree = 1.3448
```

I think that the network is sparse, in fact the giant component is small considering the number of nodes.

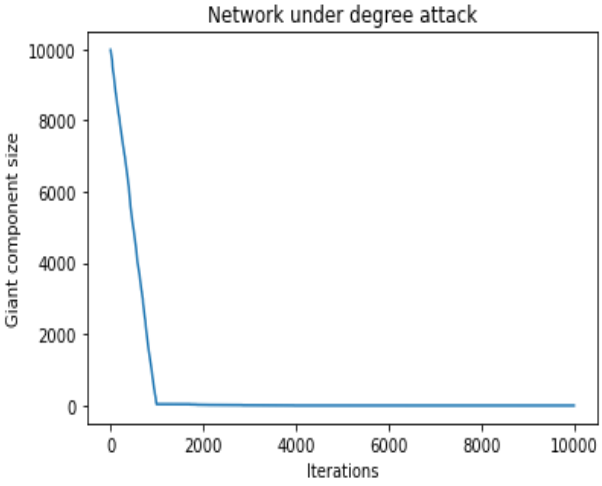


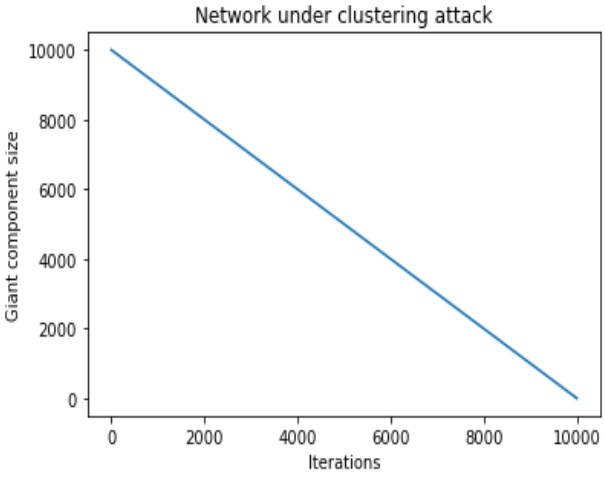
From the charts, I can see that the degree attack is more destructive than the clustering attack.

Network B

```
giant component size = 10000
Density  = 0.0002
Average Degree = 2.00
```

This network has a single giant component and the degree distribution is linear.



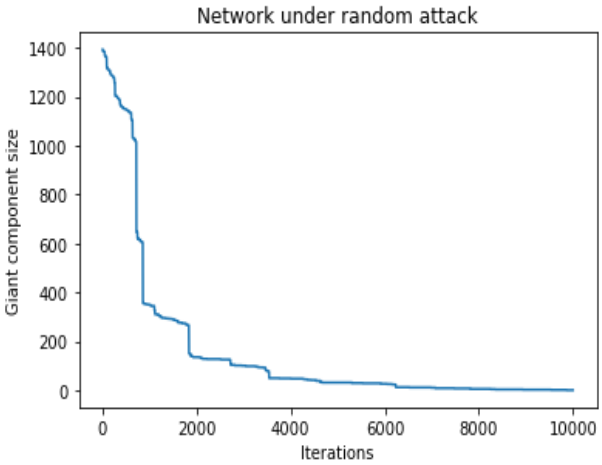


Also here the best attack is the degree one, while the clustering attack does not seem to be so dangerous, in fact the size of the giant component seems to decrease linearly.

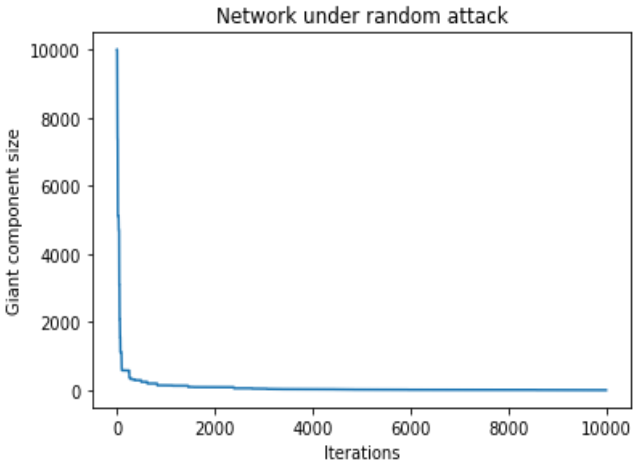
From the experiment, I can say that the protection of the degree can limits the damage best. I think that it is better that all individuals' information should be kept secret, because knowing what are the most important nodes of the network is easy to destroy it quickly while not having this knowledge who attack the network should do it randomly, so they could take nodes not very relevant and take more time to collapse it.

I have also tried to attack both networks in a random way to see if my reasoning is correct.

Attack network A



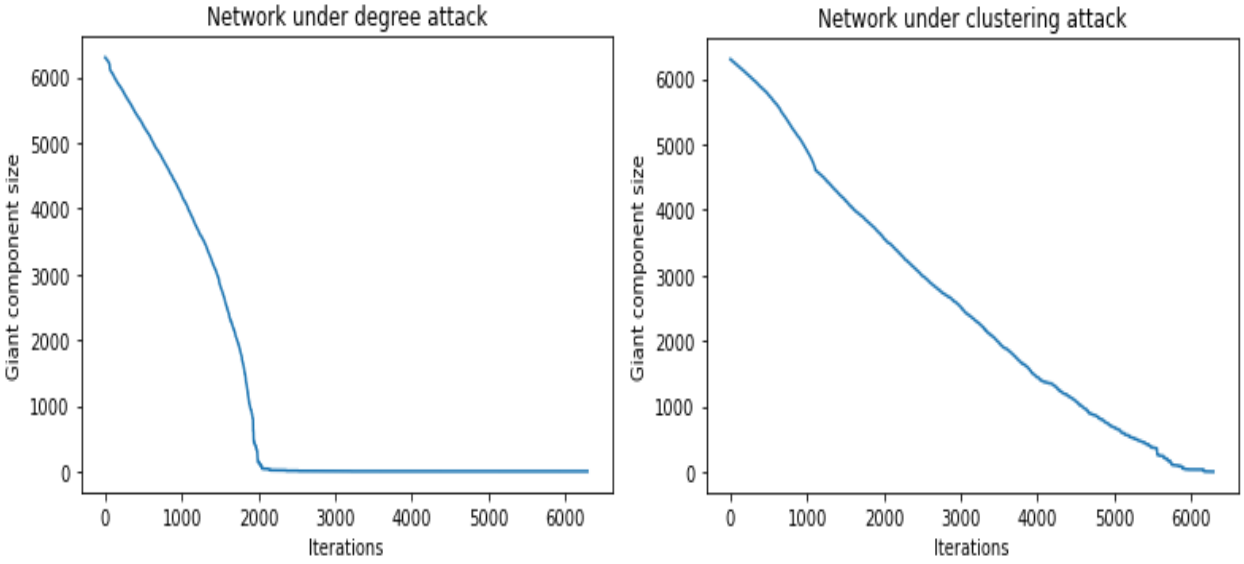
Attack network B

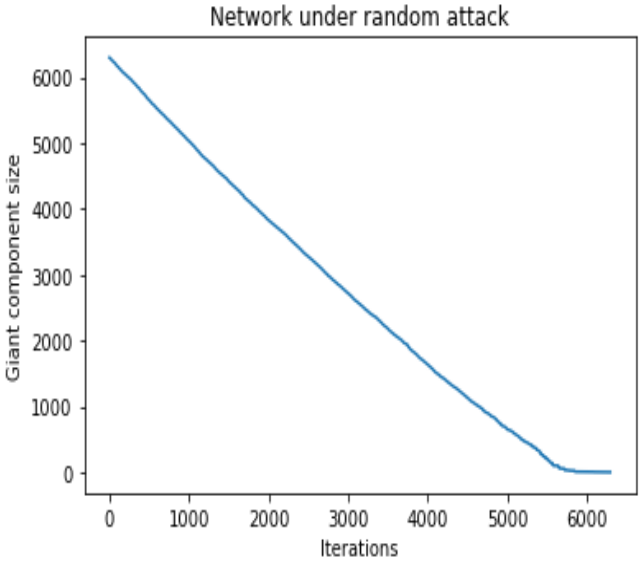


It seems that my reasoning was correct, but looking the random attack on network B I would say that the effectiveness of the attack also depends on how the network is made.

Part 2

I repeated the attack on the real graph (Gnutella), treated it as undirected.





Also in this case, the most dangerous attack is the degree, while the clustering is a weak and generates a linear trend, in fact it is equivalent to do a random one.