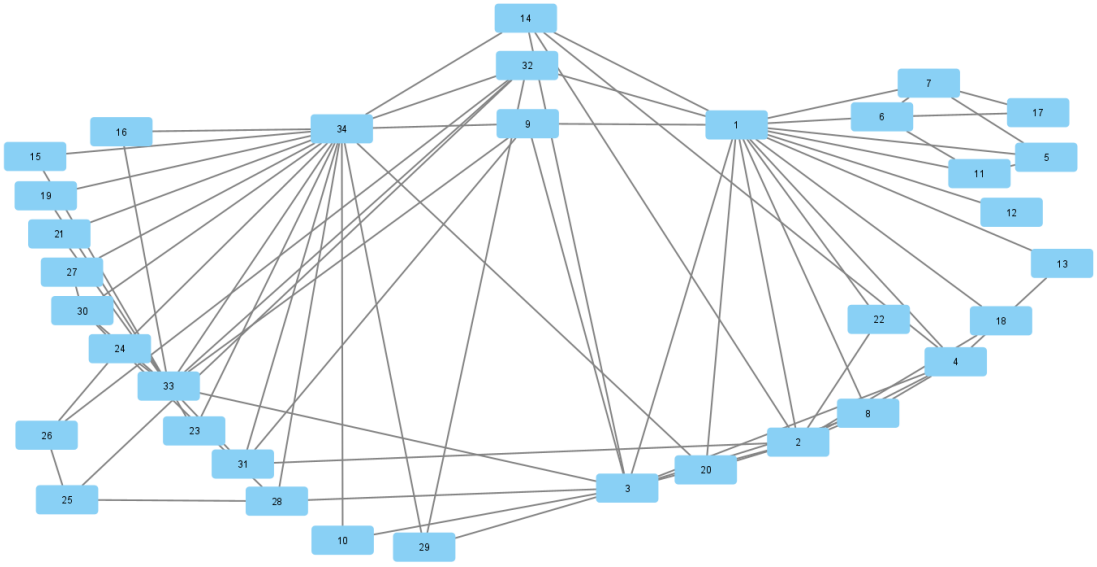
1.1 “Zachary’s Karate Club”

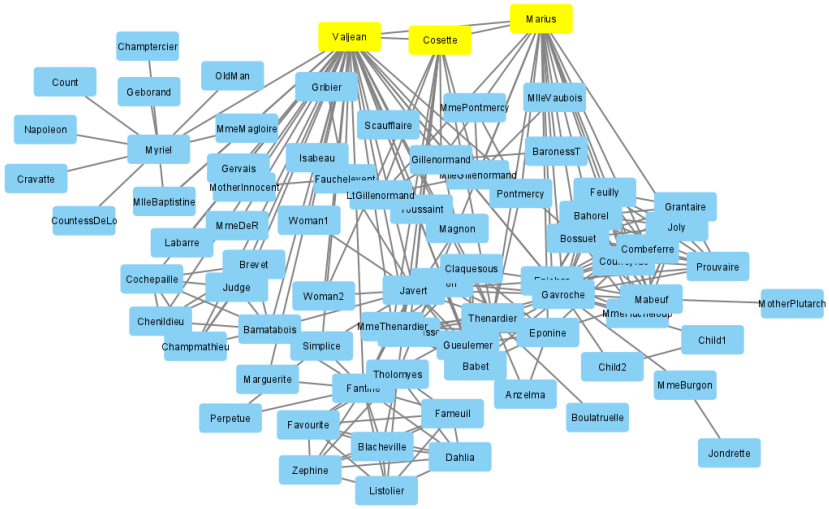
Graph:



In the graph above, nodes 1 and 34 are hubs. Notice that all other nodes have a very low degree (1-3). Meanwhile nodes 1 and 34 have a degree of approximately half the size of the network.

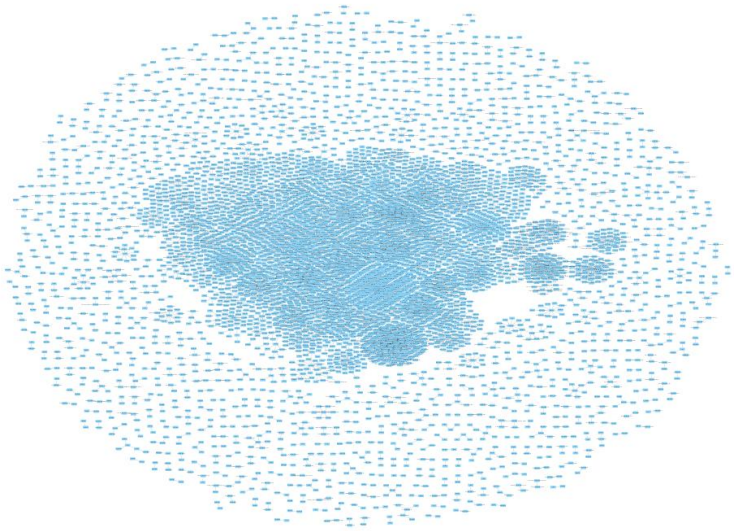
1.2 “Les Misérables”

Graph: Valjean, Cosette, and Marius are highlighted yellow



1.3 US companies co-ownership

Graph:



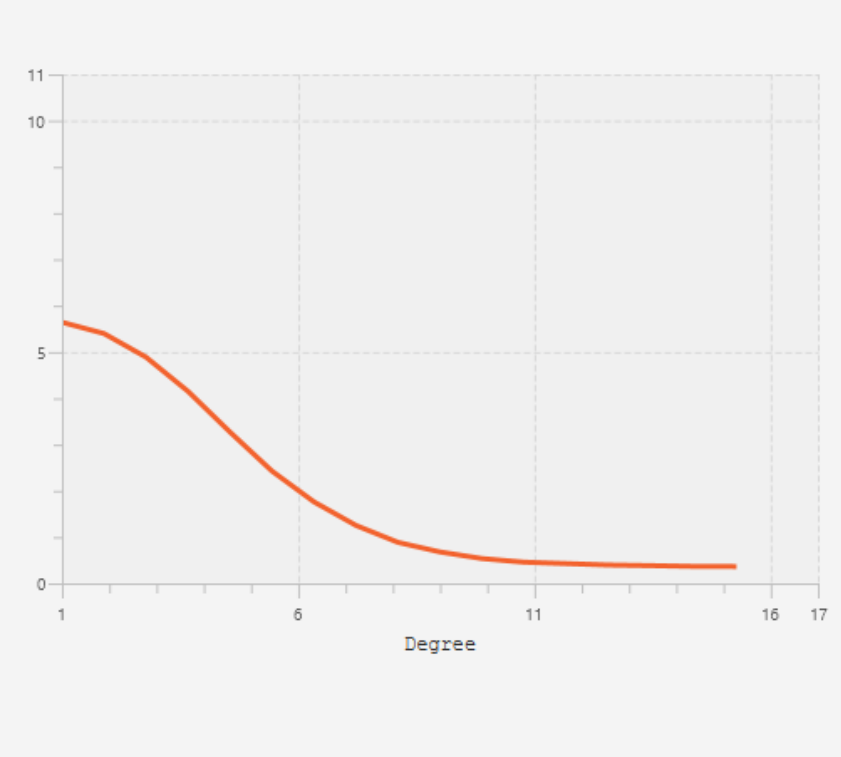
3.1 Analyze network

Number of the node with largest betweenness centrality in:

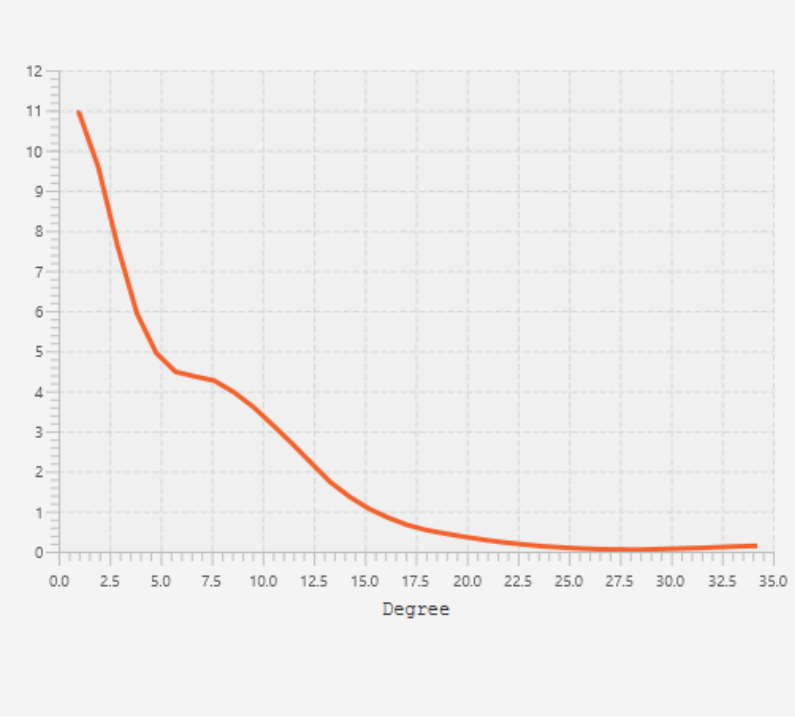
- Karate Club: node 1 with betweenness centrality of 0.4376…
- Les Misérables: node Valjean with betweenness centrality of 0.5699…

3.2 Plot different distributions

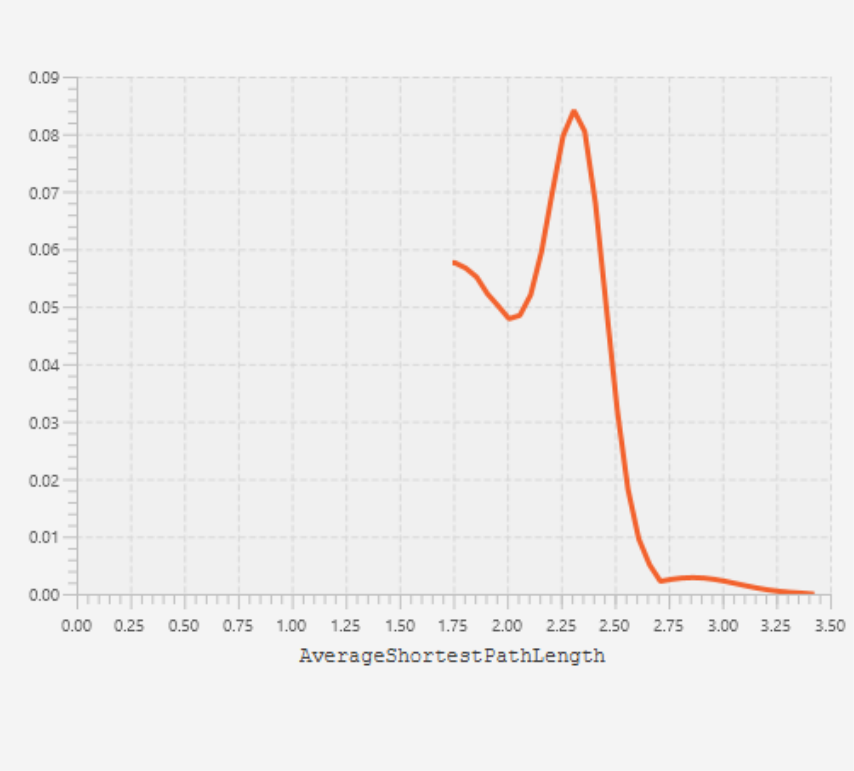
Degree distributions in Karate Club:



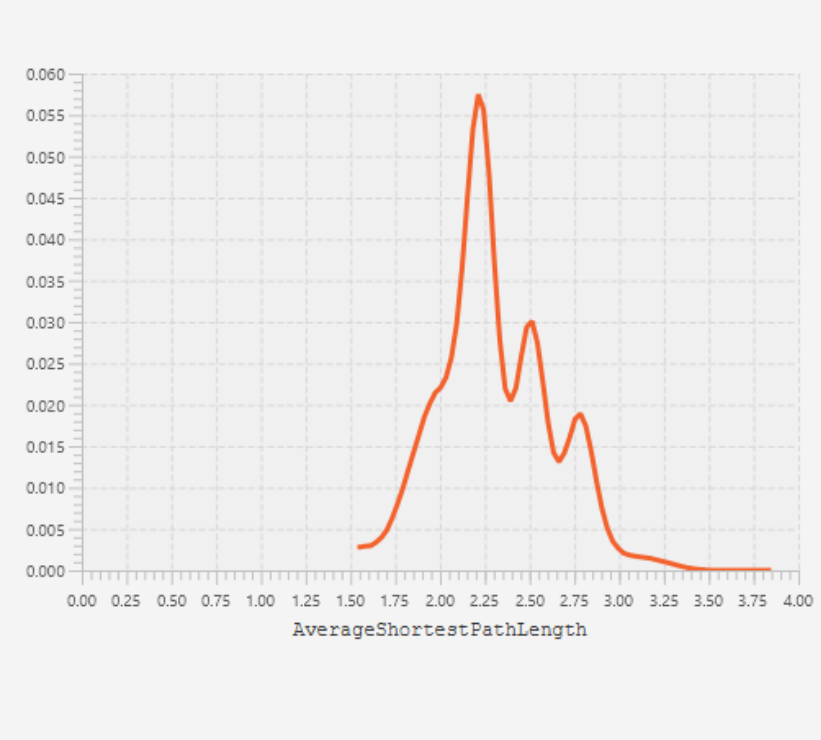
Degree distributions in Les Misérables:



Distribution of shortest path lengths in Karate Club:

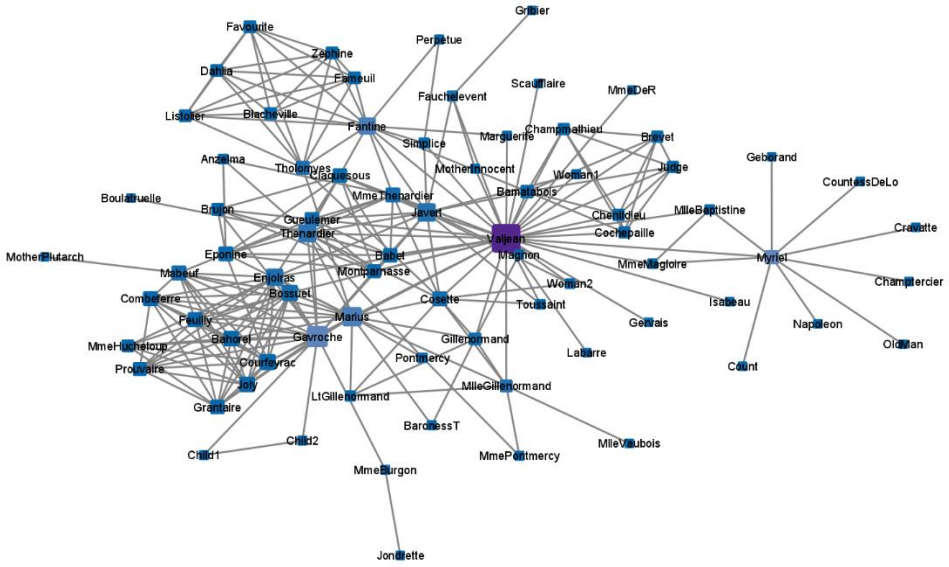


Distribution of shortest path lengths in Les Misérables:

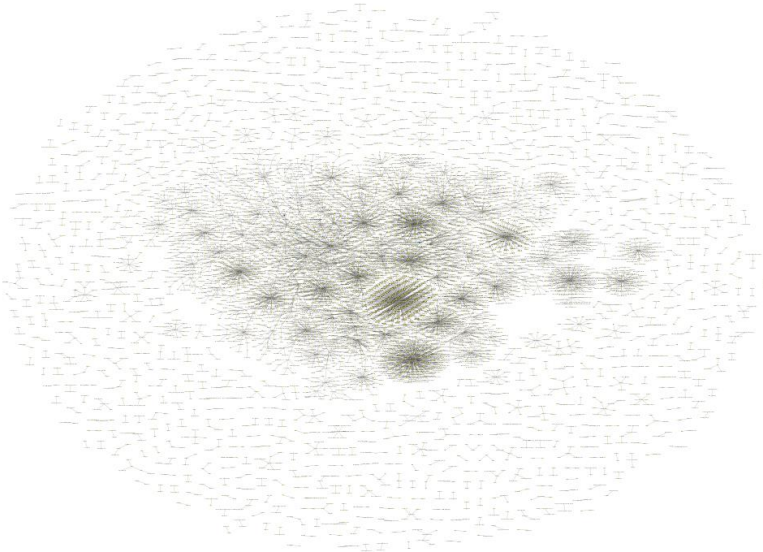


3.3 Style the network using analysis results

Les Misérables:

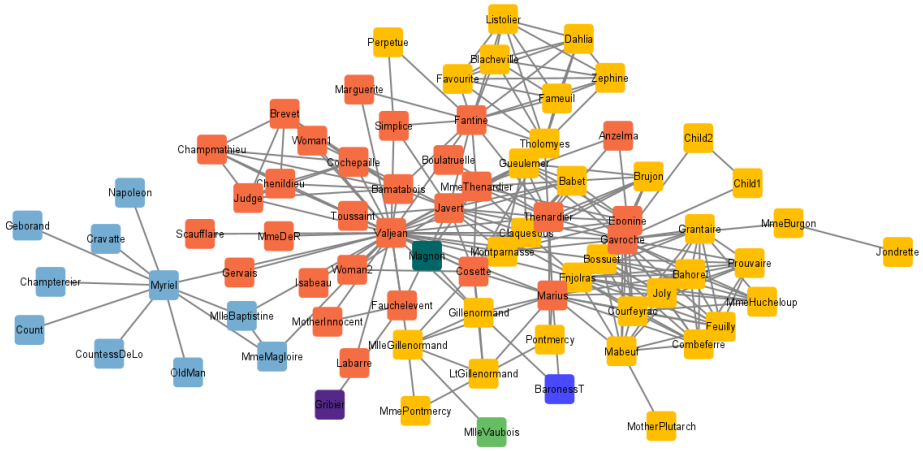


US Companies:



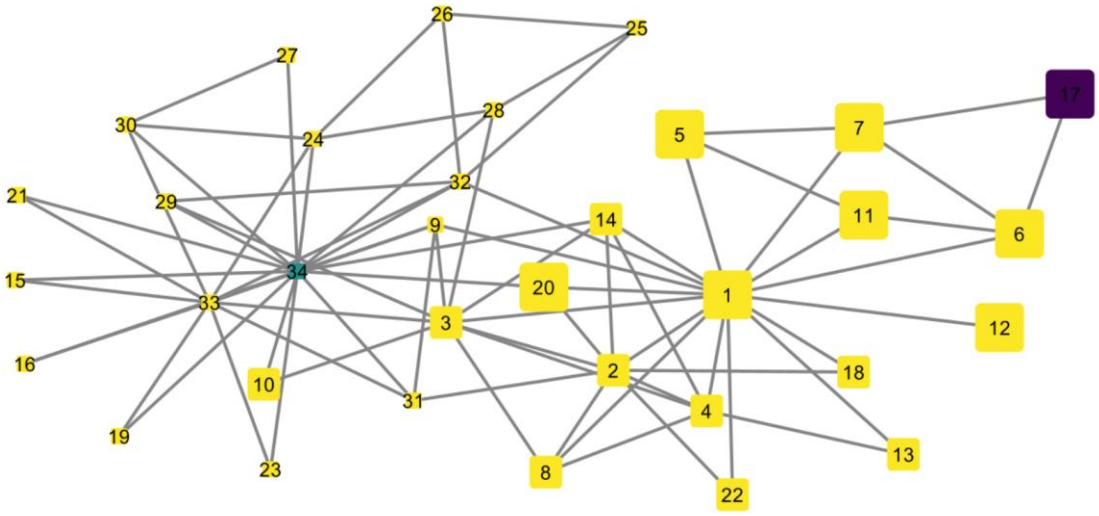
4.2 Use ClusterMaker2

Column	__APCluster
Mapping Type	Discrete Mapping
1	R:255 G:191 B:0 - #FFBF00
2	R:244 G:109 B:67 - #F46D43
3	R:116 G:173 B:209 - #74ADD1
4	R:73 G:73 B:255 - #4949FF
5	R:102 G:189 B:99 - #66BD63
6	R:0 G:102 B:102 - #006666
7	R:84 G:39 B:136 - #542788



There are 3 main colors: blue, orange, and yellow. I think these clusters represent how much the characters interact with each other.

4.3 Apply to Karate Club



The two cluster algorithms I used are Community Clustering (GLay) and Affinity Propagation. I styled the network in such a way that the fill color of the nodes is based on _APCluster and the size of the node is based on _glayCluster. From the image above, I noticed that the neighbors of node 34 are small, and the neighbors of node 1 are big. I believe that the sizes of the nodes represent the different factions in which the Karate Club split.