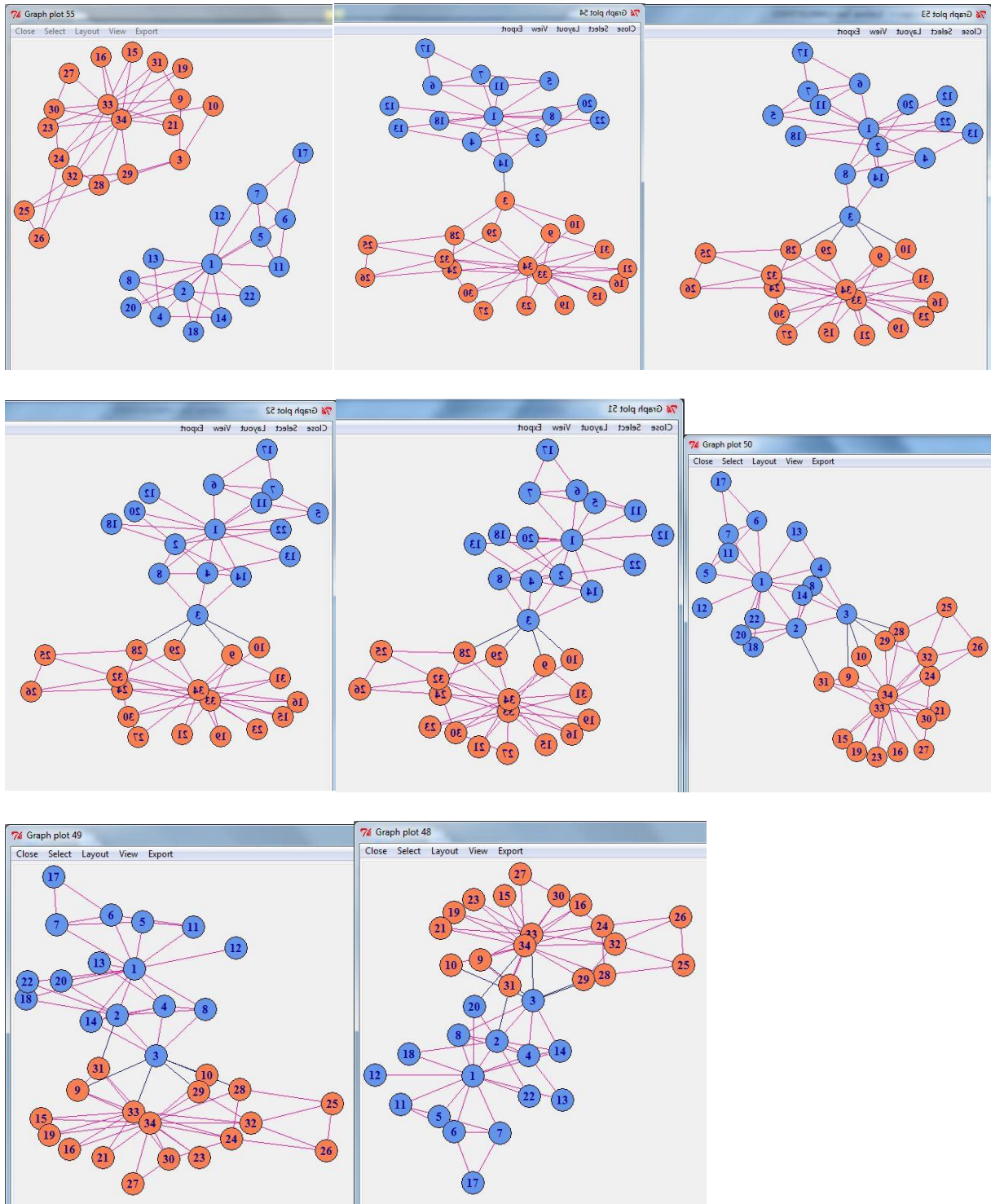
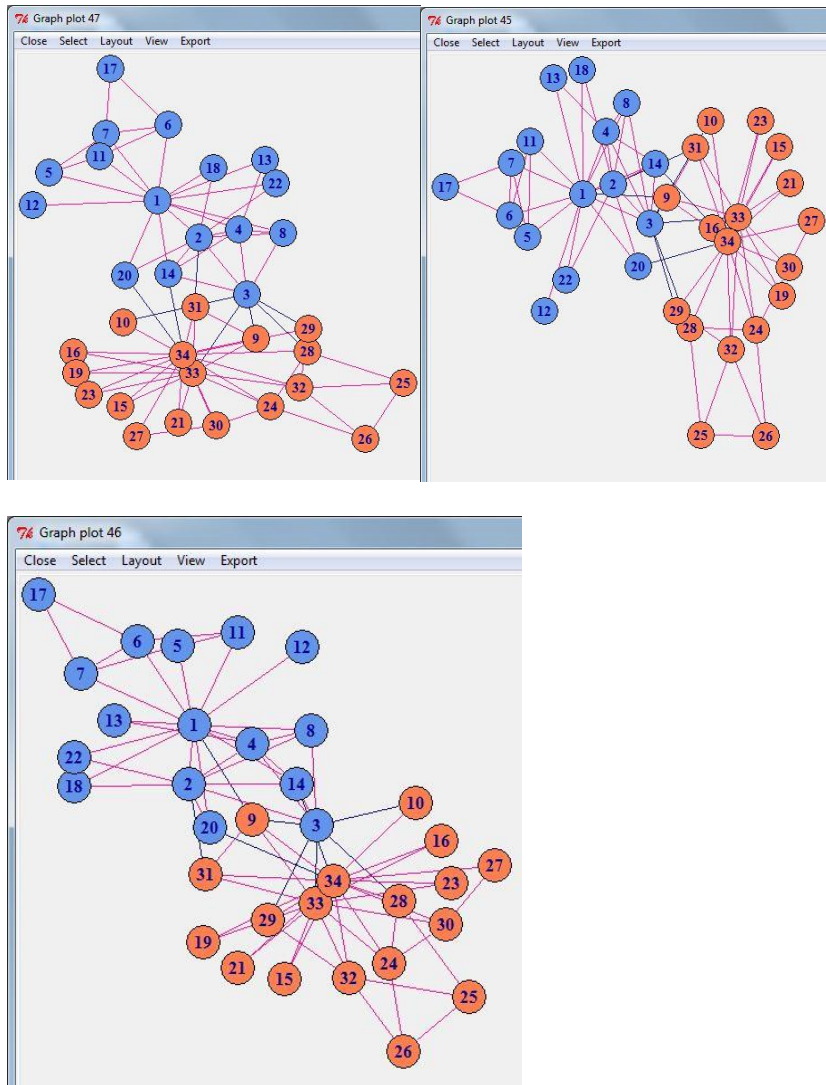


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I got the results by first reading the paper. It allowed me to get a broad idea of what we were to learn from this assignment. I then ran the R code that I found through the group email and it produced very easy to read data. I was able to alter the code to allow me to split the group into multiple factions. The visualization of the graphs showed me that node 1 and node 34 have strong ties with many nodes in the group. As long as 34 and 1 stay the subgroup leaders then other groups would not come to be. The graphs produced mirror the data presented in the paper written by Zachary. One thing I noticed is that node 10 has difficulty keeping ties with the group making him an outlier. I found that as I split the group

into more factions it had little effect on 1 and 34 because regardless they had many ties within both factions making it difficult for them to split completely.

Social networks are core to human's interactions within groups or communities. Predicting the future of groups became apparent after 34 members of a karate club were studied. Prior to the group splitting, factions of communication flow already existed. Communication flow is vital to how humans interact. For instance a person will be more likely to call a close friends than mutual friends. Studies have been done showing that humans can only maintain 150 stable social connections. A man named Robin Dunbar found that primate's brain size correlates with group size. These limits existed with the Karate club where half the group was linked to one source of club information and the other half was linked to the instructor. Factions existing in a club act to limit interactions between members. These limited interactions cause a faction to pull apart or bottle neck information.

At the clubs beginning members were all working toward a common goal, learning karate. As time progressed divergent positions about the club arose. Some of the members felt that that were not a part of ether faction leading to further bottlenecking. It got so bad in the club that the groups acted out of reaction to strengthen the separate factions. One group would withhold information from the other group and vice versa. The data acquired from this study lead me to believe that the group was doomed from the beginning. They had a minimum cut that represented a small group within the network. The small group blocks the transfer of information as well as works against group unity. The graphs provide an accurate description of the ties within the group. A man names Fulkerson created an algorithm that finds the maximum flow within a network. Finding the maximum flow is important it helps highlight the minimum flow. The minimum flow represents the factions that split.

[https://en.wikipedia.org/wiki/Ford%E2%80%93Fulkerson\\_algorithm](https://en.wikipedia.org/wiki/Ford%E2%80%93Fulkerson_algorithm)

<https://www.r-project.org/conferences/useR-2010/slides/Zhang.pdf>

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<https://cran.r-project.org/web/packages/igraphdata/igraphdata.pdf>

<https://github.com/maturban/cs595-f13/tree/master/assignment6>