Assignment #6: Cohesion and Community

# This assignment examines Cross and Parker’s advice network from an international consulting firm.

We have an igraph object stored as a .rds file in the homework data folder. The data consist of an advice seeking network within a consulting firm: (“Please indicate how often you have turned to this person for information or advice on work-related topics in the past three months”). 0: I Do Not Know This Person; 1: Never; 2: Seldom; 3: Sometimes; 4: Often; and 5:Very Often.) Not knowing and never seeking advice edges have been dropped. The \*\*igraph\*\* objects include two attributes - gender (1: male; 2: female), region (1: Europe; 2: USA). You can learn more about the data: (<https://toreopsahl.com/datasets/#Cross_Parker>).

Cross, R., Parker, A., 2004. The Hidden Power of Social Networks. Harvard Business School Press, Boston, MA.

# 1. Introductory Inspection

As always, begin by reporting basic statistics about the network, especially number of nodes and edges. Plot the network.

# 2. Components, Cliques, Cores

Use igraph to identify each of the following:

1. The size of the largest bicomponent
2. k for the largest k-core
3. The size of the largest clique

Interpret each of these characteristics of the advice network.

# 3. Extracting sub-graphs

Plot of the sub-graph of the advice network’s largest clique. Make node color the attribute that appears to be most related to this large clique. What does it say that about the network – and the organization – that this clique is composed predominantly of people with this attribute.

# 4. Communities

1. Between Louvain, Walktrap, and Leiden with low and high resolution, which community detection algorithm seems to perform best over the advice network’s giant connected component? Use modularity.
2. Which attribute is most correlated with this community detection solution?
3. Plot and interpret the network.