CS 595: Assignment #7

Due on Thursday, November 06, 2014

Dr. Nelson 4:20pm

Holly Harkins

Contents

Problem 1

Using D3, create a graph of the Karate club before and after the split.

- Weight the edges with the data from: http://vlado.fmf.uni-lj.si/pub/networks/data/ucinet/zachary.dat

- Have the transition from before/after the split occur on a mouse click.

Listing 1: Part1 Python

```
import sys
import json

#nodes = 32
obj = { "nodes" : [], "links" : [] }
count = 0

f = open("matrix.dat")
g = f.readlines()
f.close()

#grab and process the weights
for line in g[34]:
    name = count + 1
    Node = {'id' : str(name)}
    obj['nodes'].append(Node)
    col = line.split()
    for j in range(len(col)):
        if col[j] != "0":
            source = count
            weight = int(col[j])
            target = j
            newLink = \
                { "source" :source, "target" :target, "weight" :weight }
            obj['links'].append(newLink)
    count = count + 1
print(json.dumps(obj))
```

Listing 2: Part2 Python

```
#!/usr/bin/python

import json
import networkx as nx
from networkx.readwrite import json_graph

#open input directory
f = open('databefore.json')
nodes = json.load(f)
f.close()
```

Problem 1 continued on next page...

```
#link the nodes from input
graph = json_graph.node_link_graph(nodes)

#call library
while nx.number_connected_components(graph) < 2:
    edges = nx.edge_betweenness_centrality(graph)
    Max = 0
    for edge in edges:
        if edges[edge] > Max:
            #iterate over it
            Max_edge = edge
            Max = edges[edge]
    graph.remove_edge(Max_edge[0],Max_edge[1])

output = json_graph.node_link_data(graph)

g = open('dataAfter.json','w')
g.write(json.dumps(output))
g.close()
```

First I needed to convert the data file into json files. The python scripts convertJson.py and splitConvertJson.py converts the data and calculates the nodes separation. The script records all the connecting nodes > 0 as sources, weight, and target. The second script separates the nodes into groups. The nodes are split according the the weight between each links.

KarateClub.html uses both dataAfter.json and databefore.json files to graph the nodes. For fun I used your favorite team logo as the nodes. You can transition from before/after the split occur on a mouse click.

You can review the before and after split at the link below
http://www.cs.odu.edu/~hharkins/KarateClub.html

Problem 1 continued on next page...

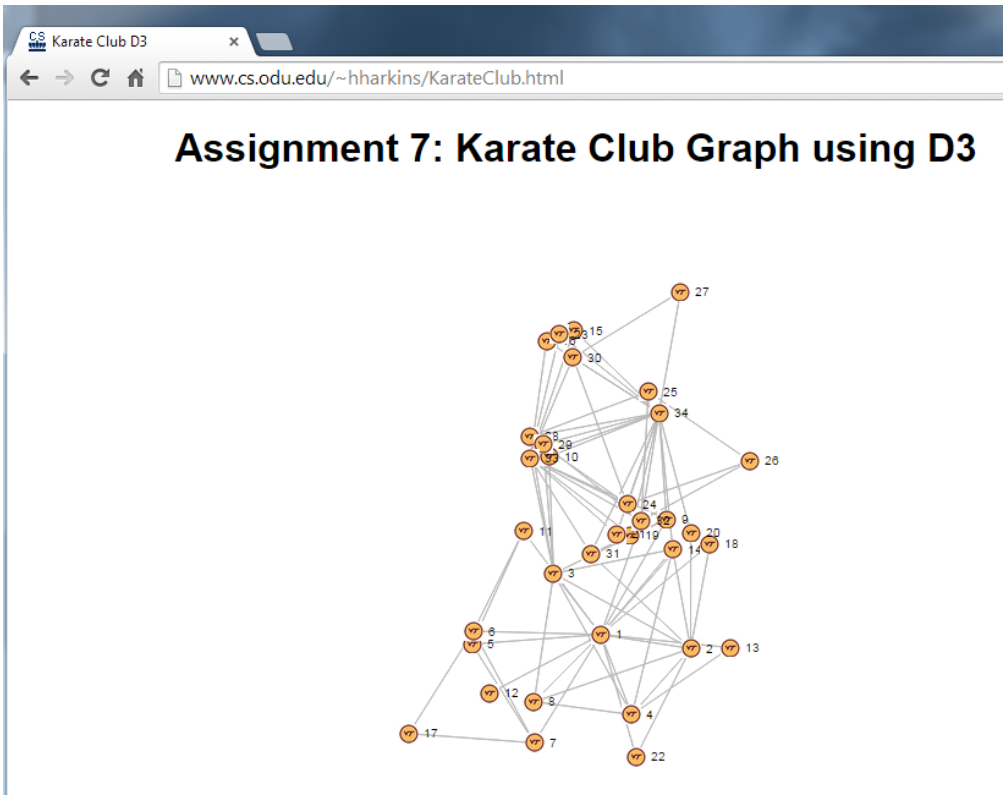

Figure 1: The Karate Club

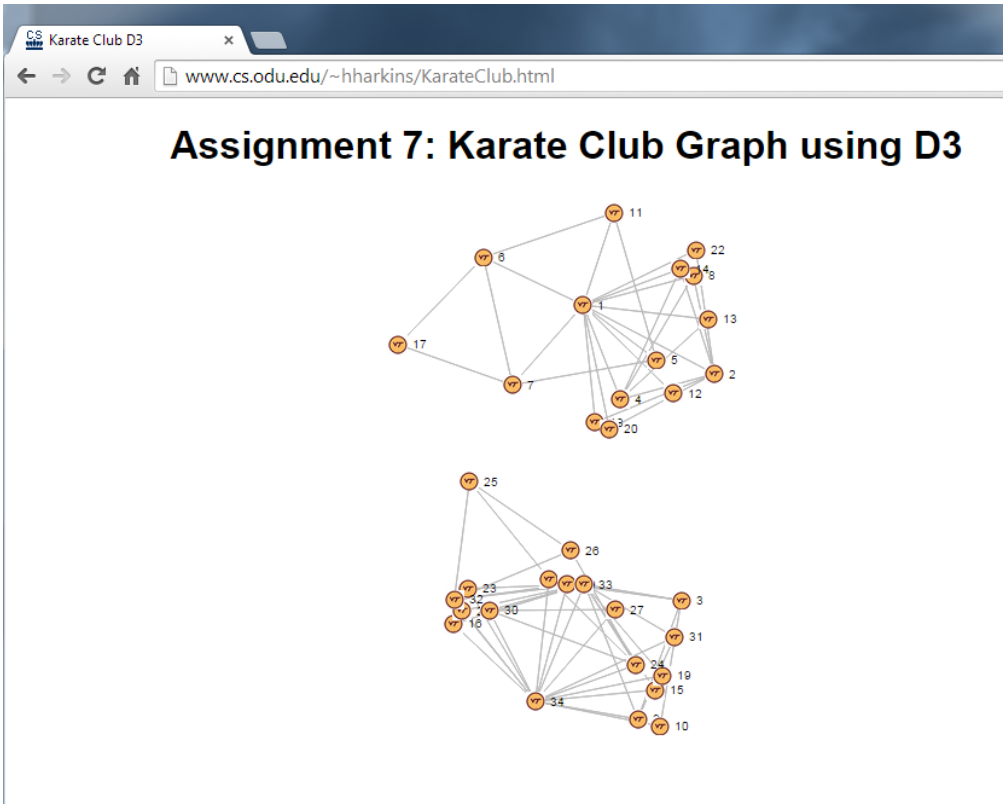

Figure 2: Karate Club Split

Problem 2

```
Use D3 to create a who-follows-whom graph of your Twitter
account.  Use my twitter account ("@phonedude_mln") if you do not
have an interesting number of followers.  Attractiveness of the
graph counts!
```

References

[1] Do, Phuoc. 3D Force Layout. https://vida.io/documents/N4jSip7n68yQ48DXp/

[2] NetworkX Developers. Karate Club. http://networkx.github.io/documentation/latest/examples/graph/karateclub.html

[3] MBOstocks. Labeled Force Layout. http://bl.ocks.org/mbostock/950642