AmericanRevolution

January 22, 2018

1 Imports

```
In [1]: import networkx as nx
        import matplotlib.pyplot as plt
        import numpy as np
```

2 Read tsv

2.0.1 Open the tsv

```
In [2]: # Data from http://konect.cc/networks/brunson_revolution/
        f = open("AmericanRevolution.tsv","r")
        text = f.readlines()
```

2.0.2 Cleans the data

```
In [3]: clean = lambda x:x.strip("\n").split(" ")
        node_pairs = list(map(clean,text[2:]))
        node_pairs = [(int(x[0]),int(x[1])) for x in node_pairs]
        node_pairs[:4]
```

```
Out[3]: [(1, 1), (1, 2), (2, 1), (2, 2)]
```

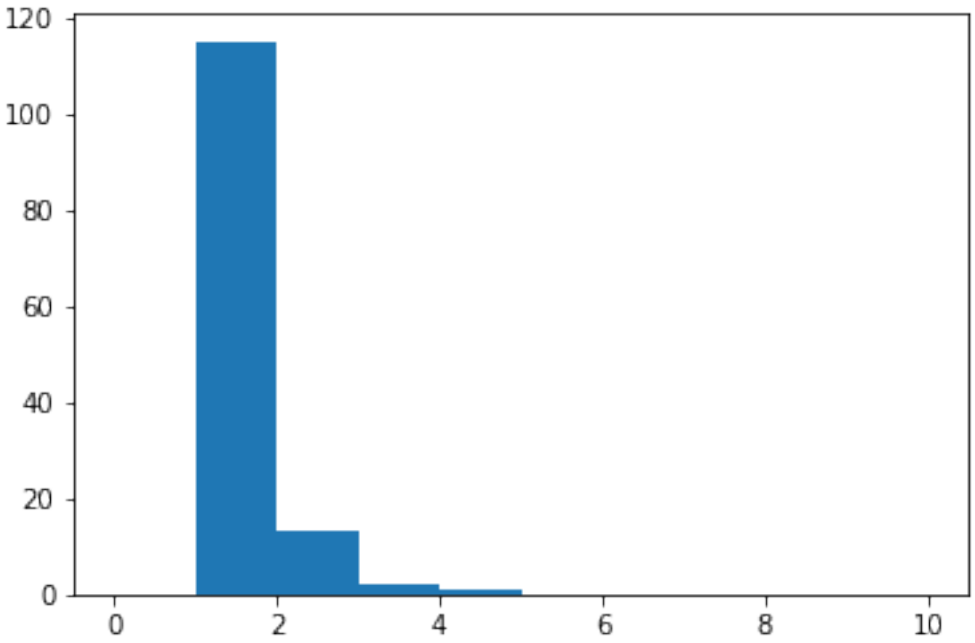
3 Converting edge pairs to NetworkX graph

```
In [4]: G = nx.Graph()
        G.clear()
        G.add_edges_from(node_pairs)
```

4 Degree Distribution

```
In [5]: node_degrees = [x[1] for x in sorted(G.degree())]
        plt.hist(node_degrees, bins = np.linspace(0,10,11))
```

```
Out[5]: (array([   0.,  115.,   13.,    2.,    1.,    0.,    0.,    0.,    0.,    0.]),
         array([  0.,   1.,   2.,   3.,   4.,   5.,   6.,   7.,   8.,   9.,  10.]),
         <a list of 10 Patch objects>)
```



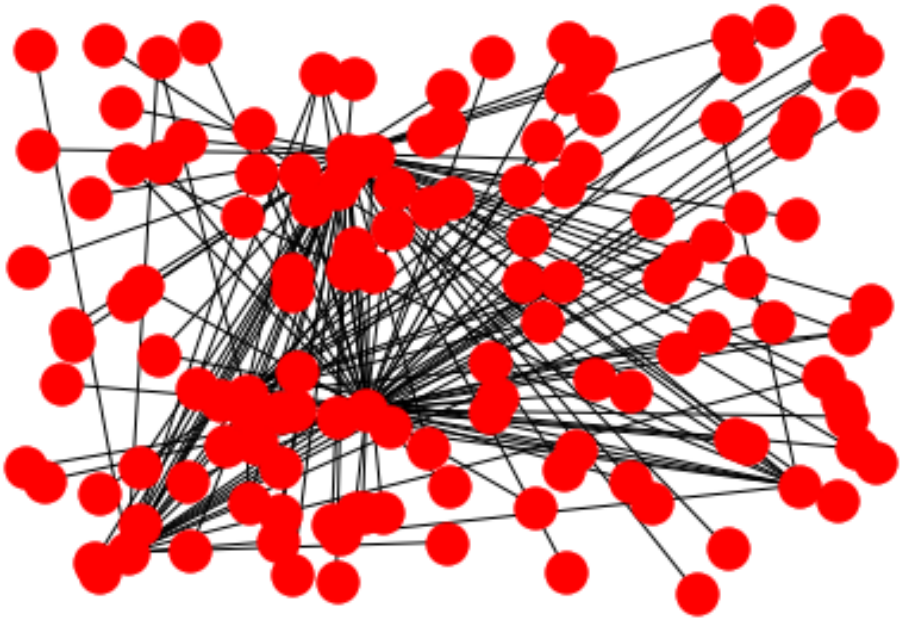
Conclusions:

The graph is connected (no zero degree nodes), and all nodes have degree >= 3

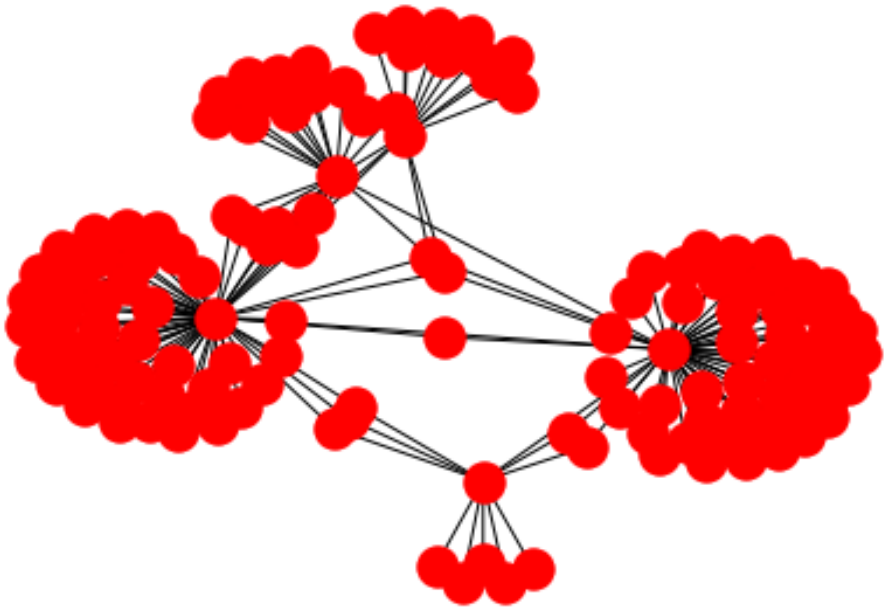
All values for

A few outliers have up to 10 roads

In [6]:
```
nx.draw_random(G)
```



In [8]:
```
# The plot below uses a technique called "Force directed Graph Drawing", but the result
# We can see the main parties by the number of people connected to them.
nx.draw_spring(G)
```



In [9]:
```
# This graph should be bipartite according to http://konect.cc/networks/brunson_revoluti
nx.bipartite.color(G)
```

```
---------------------------------------------------------------------------

NetworkXError                             Traceback (most recent call last)

<ipython-input-9-18447f0ff4b7> in <module>()
----> 1 nx.bipartite.color(G)


~/miniconda3/lib/python3.6/site-packages/networkx/algorithms/bipartite/basic.py in color
     76                 if w in color:
     77                     if color[w] == color[v]:
---> 78                         raise nx.NetworkXError("Graph is not bipartite.")
     79                 else:
     80                     color[w] = c


NetworkXError: Graph is not bipartite.
```