

## CSE 508 Information Retrieval Assignment 5

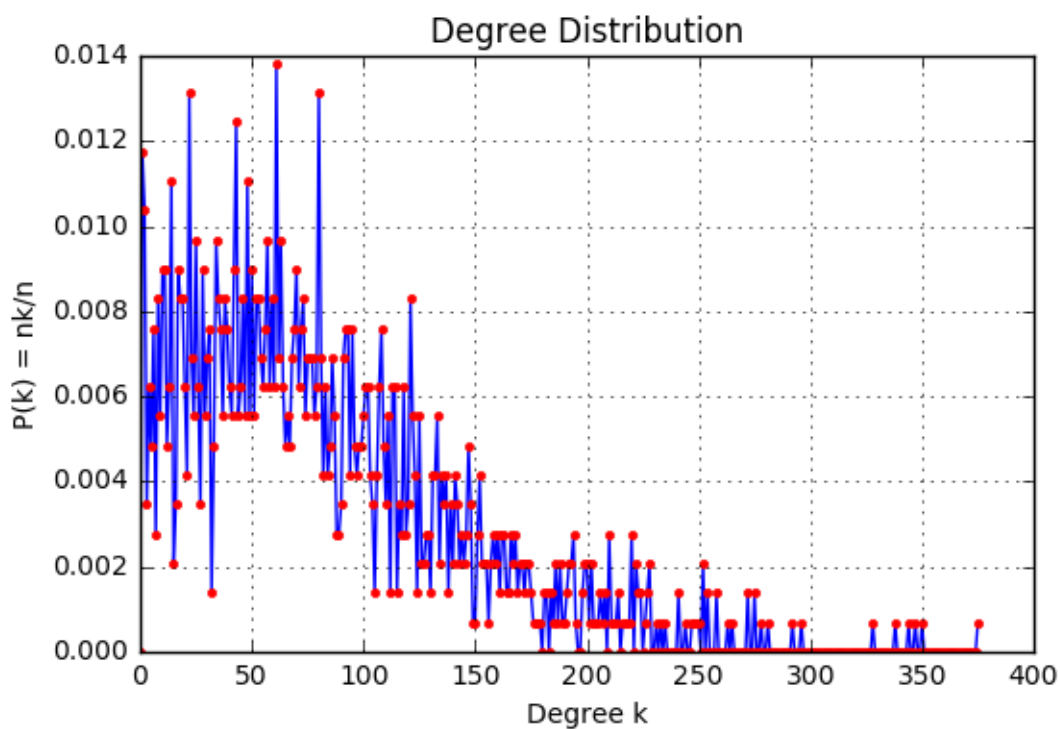
### Real World Network:

<http://networkrepository.com/socfb-Haverford76.php>

It contains 1.4K nodes and 59.6K edges. A social friendship network extracted from Facebook consisting of people (nodes) with edges representing friendship ties. The main file is in the form of mtx (Matrix Market) file. It is extracted to Adjacency Matrix using scipy.

### Degree Distribution

$$P(k) = \frac{n_k}{n}$$



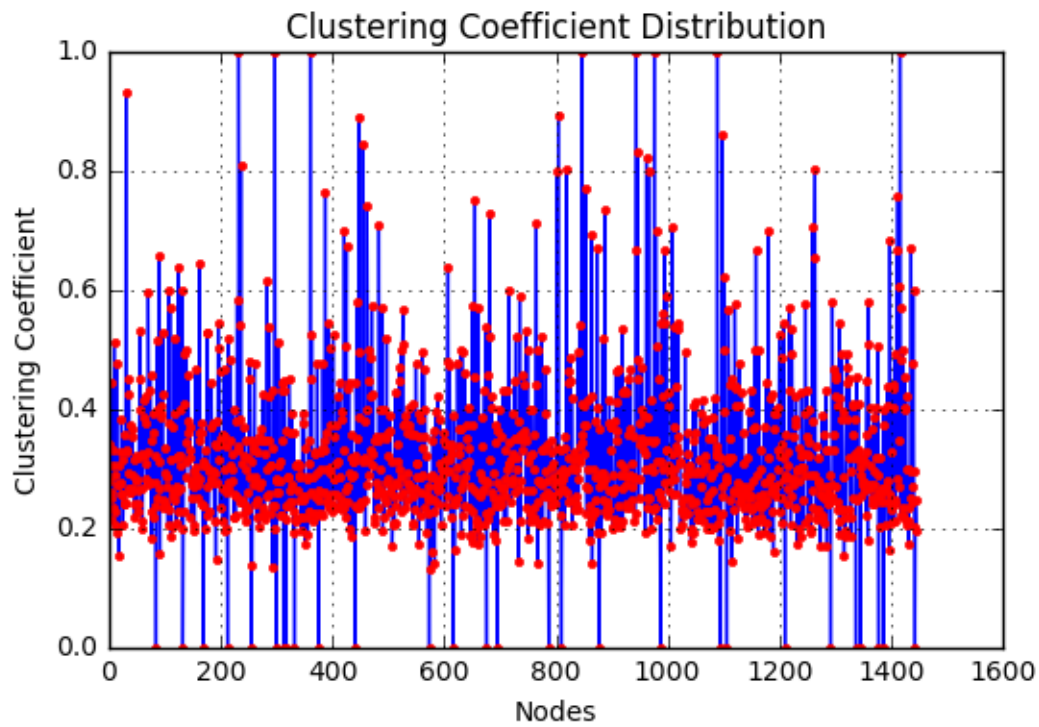
The graph is highly varying in terms of degree distribution.

Max degree = 375

Min degree = 1

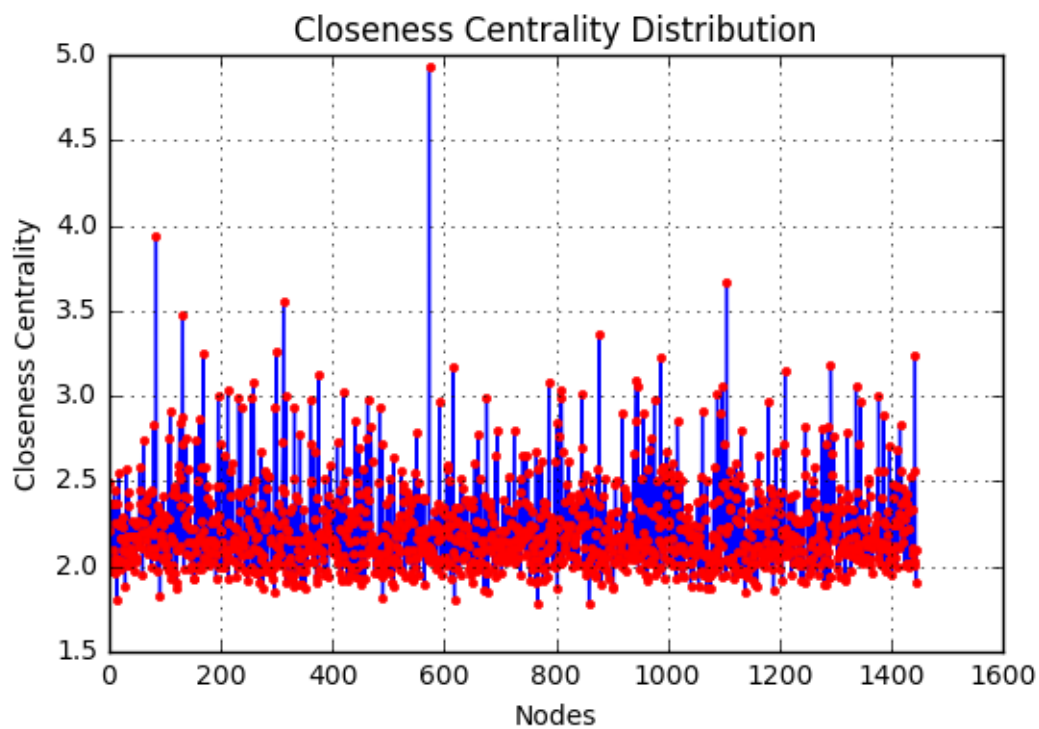
### Clustering Coefficient

$$CC(v) = \frac{N_v}{\left(\frac{k_v(k_v - 1)}{2}\right)}$$



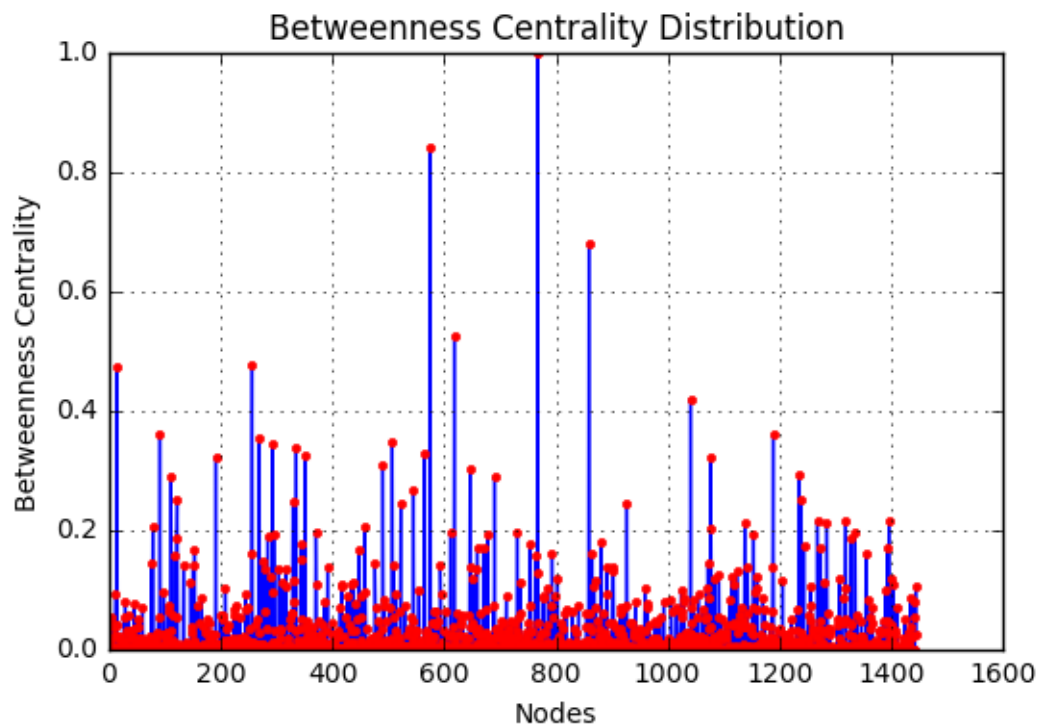
The clustering coefficient is 1 for quite a few nodes, which means there are several cliques in the graph. However, it mostly lies near 0.3, as seen from the graph.

### Closeness Centrality



Most of the values in the graph are quite low, which means that there are many central nodes and only a few non-central nodes.

### Betweenness Centrality



Complying with the closeness centrality graph above, this graph again shows that there are quite a number of central nodes as they have high betweenness centrality values.