Social Network Analysis Experiments (17MCPC14)

Summary of Analysis : for various experiements taken up during this project.

Analysis for Experiment-3

1. The Karate Club network is a fully connected network with low clustering, hence the plotted graph does not clearly give any intuition into Cutset and potential sub graphs

2. The Power Law Cluster graph, as the name indicates, clearly demonstrates clusters and gives a intuitive visibility into potential initial clusters and subsequent clusters

3. Both Eigen Value based Spectral decomposition algorithm as well as K-means algorithm result in very similar but not exactly equal clusters for K >= 2

4. Spectral decomposition takes low computation with GPU based matrix operations while K-means being in iterative algorithm takes slightly more time for K = 2

5. The eigen values and corresponding eigen vectors returned by Spectral decomposition are equal to the number of nodes of the graph G indicating that it is possible to split the graph from k clusters ranging from 1 to the #of nodes.

Analysis for Experiment-4

1. Both Preferential attachement based graph and forest fire based graph have similar measures for Clustering, Centality and Degree Distribution

2. As expected the Forest Fire graph is densely clustered from center and then speading in all directions

3. Although the preferential attachment graph is also densely clustered, the clustering is not centered. As the nodes increase, the new nodes being added are getting added next to already clustered nodes there by increasing clustering coefficients for power nodes

4. The degree distribution for both the graphs appears to follow gamma function/distribution. However, the slope of falling degrees is higher for Forest Fire model - indicating that there is one node with very high degree, then other nodes fall to significantly lower degree compared to previous ones.

5. The centrality measure (specifically the Katz centralities shown in graph) also represent a similar trend with Forest Fire model steeply increasing from low to mean centralities from the second lowest measured centrality value while the Preferential attachement model measures climbed up slightly slowly in comparision to Forest fire model.

6. The clustering coeffients for both the models follow uniform distribution meaning dense connectivity with equal number of nodes at different coefficient values.