**Assignment**

1. For the dataset assigned to you,
2. Number of nodes (n)
3. Number of edges (m)
4. Number of triangles and three node path graph
5. Maximum degree of a node
6. Average degree
7. Size of Largest connected component or Giant Component
8. Diameter
9. Power law exponent
10. Average Clustering coefficient
11. Algebraic Connectivity
12. Average Path length
13. Node betweenness distribution
14. Edge Betweenness Distribution
15. Dispersion with respect to each of the nodes’ degree i.e. Standard deviation.
16. Generate the degree distribution
17. Visualize the graph
18. Probability distribution for the length of the shortest paths pd with respect to d such that x-axis will be degree and it will vary as d=1,2,3,… and pd is to be calculated for each such shortest distance.
19. Spectral radius
20. Assortativity (determined with the help of Pearson Correlation Coefficient)

Compare the properties of this data**set with a random network (ER graph) of equal number of** nodes and **BA model (again of equal number of nodes).**

Determine each of the above properties for these models also. To ascertain the properties of ER and BA graph, run 10 iterations for both graphs. Compare the properties of both. Plot the properties for these two types of graphs) with respect to property (l), (m), (n), (o), (q) such that there is a distinct plot for each of these properties. Note that the graphs for these properties collectively for BA model, ER model and given dataset.

The submission of the result for this assignment carries 10 marks and 5 marks is of video. Hence, make the video carefully. The results are to be properly presented pertaining to both of the datasets and what you have observed in the dataset. Also, you have to explain, how the results are different from the ER model as well as BA model.

Also, note that the provided datasets are being investigated in the real world and hence, don’t submit false results or false graphs.