

Assignment 6

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Methodology:

1. Two types of dictionaries are created which have key as node id. One of them stores all node which is pointed by that node and another one stores node id from which incoming links are coming.
2. Another dictionary is used to store node id verse index id mapping.
3. A list of lists is used to create an adjacency matrix where index value 1 means there is a connection otherwise the value is 0.
4. There are three lists which are used to store in-degree, out-degree and the total degree of nodes. Later those lists are used to generate to create degree distribution graph.
5. The formula used for density,
$$\text{Network density} = \frac{\text{\#edges}}{(\text{\#potential edges})}$$
6. The formula used for cluster coefficient,
$$\text{Cluster coefficient} = \frac{2 * p}{(n(n-1))} \quad [p - \text{number of link b/w neighbour, } n - \text{\#neighbour}]$$
7. In case of question 2, first edges are added into the graph and then I have used inbuilt functions for calculation the rank list.

Assumption:

1. The total degree of a directed graph = In-degree + Out-degree
2. For centrality, degree centrality is considered.