**This script added the phenomenon of Rich getting richer to watts-strogatz model**

**Algorithm:**

1) Initial input of number of nodes and regularity of network and rewiring probability is taken from STDIN

2) Now Watts-strogatz model is developed from the above parameters

3) New network with rich getting richer phenomenon is network with twice of the curren network size( in terms of number of nodes)

4) Each time a new node is added to the network a random number is generated, and compared to the normalized degree of the netwrok nodes

5) if rand\_number < normalized degree of node then the new node is connected with the old one

After iterating this for all new nodes (equal to number of nodes in network at the beginning)

We get a new network

**Proof that network follows rich getting richer phenomenon:**

1. Every time a new node is added, normalized degree is calculated for the existing nodes
2. “If rand\_num < normalized degree of node then these two are connected”, this statement says that if at all possible that a new node is first connected to node with highest degree and the second highest degree and etc…
3. So a node with highest degree will be always get connected to each new node that comes in
4. And for remaining nodes a rich node gets connected first and then later if possible next rich node gets connected if condition (2) satisfies
5. This clearly states the phenomenon of “Rich getting richer”

**Observation:**

1. Rich getting richer phenomenon is added to the graph and its degree distribution and average clustering coefficient are observed
2. Degree distribution observed is not scale free, but log\_plot resembles random graph’s degree distribution
3. Average clustering coefficient is close to random network