CSE310 Data Structure and Algorithm Proj-3 Full

Xiao Liu

ASUID: 1211522751

1. Clustering coefficient, $\gamma(Gr)$, and the characteristic path length, $L(Gr)$, of the graph Gr.

   Table I presented the computed clustering coefficient and CPL.

   Table I

	Cluster Coefficient	Characteristic path length
r = 0.95	0.441736	19.4677
r = 0.925	0.52368	15.9023
r = 0.9	0.564926	12.6393

2. Compute the clustering coefficient, $\gamma(G_{random})$, and the characteristic path length, $L(G_{random})$, of a random graph G_{random} corresponding to each Gr.

   Table II presented the computed cluster coefficient and CPL of the random graph.

   Table II

	Cluster Coefficient	Characteristic path length
r = 0.95	0.003396	3.3875
r = 0.925	0.005969	2.7387
r = 0.9	0.008994	2.4041

   From the Table I and table II, we can see that for the given graph, $\gamma(Gr) >> \gamma(Grandom)$ and $L(Gr) >> L(Grandom)$, it is because Gr is a small-world graph, its nodes are highly connected with each other.

   For different correlation coefficient, it showed the same results. With correlation coefficient decrease, it is easier to form edges between two nodes, therefore, the cluster coefficient of the graph has increased and the CPL is decreased for it can find “shorter” path compare to the graph with larger correlation coefficient.