

PHYS 597A: Graphs and networks in systems biology

Homework assignment 3, due Tuesday Feb. 5

1. Construct a graph with 10 nodes and 15 edges. The edges can be undirected or directed; note that you will need to use the digraph framework if there is even one directed edge. Determine

(a) the distance distribution (remember that not having a path corresponds to an infinite distance);

(b) the graph efficiency;

(c) the distribution of node betweenness centralities. You can use binning if you like it better but it is not necessary.

(d) the cumulative distribution of node betweenness centralities $P(\textit{betweenness} \geq b)$ as a function of b . You can use the actual betweenness values you found previously as b , or units of your choosing.

(e) the number of cycles, cliques or other notable subgraphs.

Extra credit: use edge weights.