

# CMPS 497E: Graphs and networks in systems biology

## Homework assignment 3, due Tuesday Feb. 3

Construct a graph with 8 nodes and 12 undirected edges. 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  $P(\text{betweenness} > b)$  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 or directed edges.