Assignment 1
Due in class on Tue September 12th

Reading: Chapters 1 and 2 of textbook.

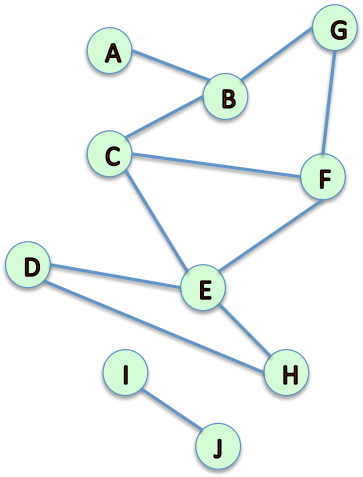
1. Give 3 examples real world networks that were not mentioned in class. For each network, discuss the following:
    a. What do the nodes represent?
    b. What do the edges represent?
    c. Is the network directed or undirected?
    d. Would you expect the network to have giant components? If so, how many?
    e. Would you expect cycles to be present?

    Note: You do not need to draw the networks or list the edges. A description of the network is enough.

2. Discuss the following about Milgram's Small World Experiment:
    a. Do the results of the experiment provide enough evidence that the median shortest path between any two people in the planet is 6?
    b. The target person in the experiment was a stockbroker in Boston. Do you think the results of the experiment would change if a different target person were chosen? If so, how?
    c. Do the successful chains – those that reached the target – necessarily follow the shortest path between the starter and the target? Explain.

3. Problem 1 section 2.5 of textbook

4. Consider the shown network:
    a. Identify the longest cycles in the network.
    b. Find the distance from node G to every other node in the network using breadth-first search. Draw a diagram of the breadth-first search procedure similar to the one shown in class, where each new layer of nodes is identified and circled.
    c. Is the network connected? Explain.
    d. How many nodes are in the largest component of the network?



5. Construct a network with 10 nodes and 9 edges such that:
    a. The network has diameter 9
    b. The network has diameter 2.