1. Consider the network described by the table on the right. [This is tricky to draw in ASCII so I'll simply provide all of the information -- you should draw this for yourself, with node 'a' above, node 'd' below, and nodes 'b', 'c' in the middle (horizontally in between 's' and 't'; vertically in between 'a' and 'd').]

edge	capacity
s -> a	10
s -> b	8
s -> d	5
b -> a	3
b -> c	10
b -> d	3
a -> c	3
a -> t	5
d -> c	3
d -> t	10
c -> t	8

   (a) Find a maximum flow in this network. (Hint: start with augmenting paths that are as "direct" as possible, i.e., using few edges).

   (b) Identify all forward and backward edges across cut X_0 = ({s,b,c,d},{a,t}).

   (c) Compute the capacity of cut X_0, and the flow across X_0, based on the maximum flow you found in part (a).

   (d) Find a cut in the network above whose capacity is equal to the value of your maximum flow. Use the algorithm outlined in the proof of the Ford-Fulkerson theorem.

2. Explain carefully how to solve the maximum flow problem in a multi-source, multi-sink network -- one where there can be more than one source vertex s_1,...,s_k and more than one sink t_1,...,t_l. Give a detailed answer and justify that your solution is correct.