1. Suppose that, in addition to edge capacities, a flow network has ***vertex capacities***. That is each vertex has a limit *l* on how much flow can pass through . Show how to transform a flow network with vertex capacities into an equivalent flow network G_0 without vertex capacities, such that a maximum flow in G_0 has the same value as a maximum flow in G. How many vertices and edges does G_0 have?

2. (true/false with explanation) Let G be a weighted directed graph with exactly one source s and exactly one sink t. Let (A,B) be a maximum cut in G, that is, A and B are disjoint sets whose union is V, $s \in A$, $t \in B$, and the sum of the weights of all edges from A to B is the maximum for any two such sets. Now let H be the weighted directed graph obtained by adding 1 to the weight of each edge in G. Then (A,B) must still be a maximum cut in H.

3. Find the max-flow in the given graph and the min-cut.