Math 4620/5620
Practice problems on Min Cost Flow

1. A company will be producing the same new product at two different factories, and then the product must be shipped to two warehouses. Factory 1 can send an unlimited amount by rail to warehouse 1 only, whereas factory 2 can send an unlimited amount by rail to warehouse 2 only. However, independent truckers can be used to ship up to 50 units from each factory to a distribution center, from which up to 50 units can be shipped to each warehouse. The shipping cost per unit for each alternative is shown in the following table, along with the amounts to be produced at the factories and the amounts needed at the warehouses.

From \ To	Distribution center	Warehouse 1	Warehouse 2	Output
		Unit shipping cost		
Factory 1	3	7	-	80
Factory 2	4	-	9	70
Distr. center		2	4	
Allocation		60	90	

Formulate the network representation of this problem as a minimum cost flow problem.

2. Reconsider the minimum cost flow problem formulated in Problem 1. Ignore the upper bounds on the arcs when solving the following subproblems.
a) Obtain an initial BF solution by solving the feasible spanning tree that corresponds to using just the two rail lines plus factory 1 shipping to warehouse 2 via the distribution center.
b)   Use the network simplex method to solve this problem.