Homework 8
Due 3/15

1. Consider a Transportation problem with 2 supply points and 3 demand points. The supply at points 1 and 2 is $\{40, 60\}$ while the demand points request $\{20, 30, 40\}$. The costs from Supply point 1 to the demand points is $\{2, 3, 6\}$ respectively, while the costs from supply point 2 to the demands is $\{5, 18, 20\}$. Model this as a balanced transportation problem, and then solve for a basic feasible solution using Vogel's Method.

2. You are in charge of handing out project assignments to five groups. The projects are labeled A,B,C,D,E. Each group hands in a list of their preferred project. Their rankings are in the following table (top project is first choice).

1	2	3	4	5
A	B	C	A	A
B	A	B	C	E
C	C	A	B	C
D	D	E	D	D
E	E	D	E	B

   Model this problem and solve for an optimal pairing of group to project trying to minimize the sum of slot values assigned to the groups.

3. Consider the following edge costs for a network (blank cells have no edge connecting)

-	1	2	3	4	5	6	7
1	0	2	3	-	-	-	-
2	-	0	-	-	3	-	-
3	-	-	0	1	3	-	-
4	-	-	-	0	-	3	4
5	-	-	-	2	0	-	2
6	-	-	-	-	-	0	-
7	-	-	-	-	-	-	0

   (a) Draw the graph of this network

(b) Find the shortest path from node 1 to all other nodes in the network using Dijkstra's algorithm

(c) What path do you follow to get from 1 to 7 in the shortest distance?

(d) What is the length of the shortest path from 2 to 1?

4. Consider a 6 node graph with the following edge capacities.

-	1	2	3	4	5	6
1	0	3	4	-	-	-
2	-	0	-	2	-	-
3	-	-	0	2	3	-
4	-	-	-	0	-	3
5	-	-	-	-	0	4
6	-	-	-	-	-	0

Solve for the maximum flow that can be sent from 1 to 6.