King Fahd University of Petroleum and Minerals
Department of Mathematics and Statistics
STAT-361 Operations Research I [1]
HomeWork 3
Three Problems due May 5^{th}, 2015 [2]

Problem 1 **(15 Points)**

The company $Z - Car$ produces a unique model of spare parts for heavy duty transportation vehicles. The manager of the company is asking you to find the optimal solution to its transportation problem. The company has 4 plants supplying 5 customer zones. The following table 1 displays the unit transportation costs, the supplies and the demands.

Demand Nodes $\rightarrow$	1	2	3	4	5	
Supply Nodes $\downarrow$	Costs					Offer
1	5	4	6	4	7	1000
2	4	3	5	8	5	1200
3	4	7	6	5	2	800
4	3	5	2	6	4	1100
5	5	1	3	4	9	900
Demand	1200	400	1000	1300	1100	

Table 1: Data for problem 1

[1] Dr. Slim Belhaiza (c)
[2] This is NOT a team assignment.

Problem 2 **(**15 **pts)**

Consider the following linear program:

$$\begin{array}{ll} \max\limits_{x_1,x_2} & 5x_1 + 4x_2 \\ \text{s.t.} & 4x_1 + x_2 \leq 3, \\ & x_1 + 3x_2 \leq 4, \\ & x_1, x_2 \geq 0. \end{array}$$

Solve the linear program using the Revised Simplex algorithm.

Problem 3 (20 **pts)**

Consider the following linear program:

$$\begin{array}{ll} \min\limits_{x_1,x_2,x_3} & 3x_1 + 2x_2 + 4x_3 \\ \text{s.t.} & x_1 + x_2 + 2x_3 \leq 3, \\ & x_1 - x_2 + x_3 \geq 3, \\ & 2x_1 + x_2 + x_3 \leq 5, \\ & x_1, x_2, x_3 \geq 0. \end{array}$$

Solve the linear program using the Dual Simplex algorithm.