620-261 Introduction to Operations Research

TUTORIAL 9

1. Solve the transportation problem in which $m = 3, n = 4$, $a_1 = 35, a_2 = 50, a_3 = 40$ $b_1 = 45, b_2 = 20, b_3 = 30, b_4 = 30$ and the matrix of transportation costs is given by

c_{ij}	1	2	3	4
1	8	6	10	9
2	9	12	13	7
3	14	9	16	5.

2. For what range of values of $c_2,\ c_3$ and b_1 does the old basis remain optimal and the basis remain feasible?

   Initial tableau:

BV	z	x_1	x_2	x_3	x_4	x_5	x_6	RHS
x_4	0	6	2	1	1	0	0	8
x_5	0	4	3	2	0	1	0	12
x_6	0	1	6	3	0	0	1	2
z	1	2	8	3	0	0	0	0

   Final tableau:

BV	z	x_1	x_2	x_3	x_4	x_5	x_6	RHS
x_1	0	1	0	0	$\frac{3}{17}$	0	$-\frac{1}{17}$	$\frac{22}{17}$
x_5	0	0	0	$\frac{1}{2}$	$-\frac{21}{34}$	1	$-\frac{5}{17}$	$\frac{110}{17}$
x_2	0	0	1	$\frac{1}{2}$	$-\frac{1}{34}$	0	$\frac{3}{17}$	$\frac{2}{17}$
z	1	0	0	-1	$-\frac{2}{17}$	0	$-\frac{22}{17}$	$-\frac{60}{17}$