

Group Work 7.4

Consider the optimal solution given below.

	$v_1 = 6$	$v_2 = 6$	$v_3 = 10$	$v_4 = 2$	Supply
$u_1 = 0$	8	6	10	9	35
$u_2 = 3$	9	12	13	7	50
$u_3 = 3$	14	9	16	5	40
Demand	45	20	30	30	125

There are several changes we'll look at:

- Change the cost, c_{ij} for a NBV.
- Change the cost for a basic variable.
- Change supply s_i and demand d_j by Δ (must do both to stay balanced).

1. Change a NBV: c_{11} from 8 to $8 + \Delta$:

	$v_1 = 6$	$v_2 = 6$	$v_3 = 10$	$v_4 = 2$	Supply
$u_1 = 0$	8	6	10	9	35
$u_2 = 3$	9	12	13	7	50
$u_3 = 3$	14	9	16	5	40
Demand	45	20	30	30	125

2. Change a BV: Change c_{13} from 10 to $10 + \Delta$.

	$v_1 = 6$	$v_2 = 6$	$v_3 = 10$	$v_4 = 2$	Supply
$u_1 = 0$	8	6	10	9	35
		10	25		
$u_2 = 3$	9	12	13	7	50
	45		5		
$u_3 = 3$	14	9	16	5	40
		10		30	
Demand	45	20	30	30	125

3. Change s_i, d_j when x_{ij} is basic: $s_1 = 35 + \Delta$, $d_2 = 20 + \Delta$.

	$v_1 = 6$	$v_2 = 6$	$v_3 = 10$	$v_4 = 2$	Supply
$u_1 = 0$	8	6	10	9	35
		10	25		
$u_2 = 3$	9	12	13	7	50
	45		5		
$u_3 = 3$	14	9	16	5	40
		10		30	
Demand	45	20	30	30	125

4. Change s_i, d_j when x_{ij} is nonbasic: $s_1 = 35 + \Delta$, $d_4 = 30 + \Delta$.

	$v_1 = 6$	$v_2 = 6$	$v_3 = 10$	$v_4 = 2$	Supply
$u_1 = 0$	8	6	10	9	35
		10	25		
$u_2 = 3$	9	12	13	7	50
	45		5		
$u_3 = 3$	14	9	16	5	40
		10		30	
Demand	45	20	30	30	125