

§7.3 (PART 1): TRANSPORTATION SIMPLEX METHOD

1.] Solve the following Transportation LP using the Transportation Simplex Method:

(a) Starting iteration:

		$V_1=10$	$V_2=2$	$V_3=4$	$V_4=15$	Supply
$U_1=0$	10		2	20	11	15
	5		10	-10	-4	
$U_2=5$	12		7	9	20	25
	3	5		15	5	
$U_3=3$	*Enter 4		14	16	18	10
	9		-4	-9	10	
Demand	5	15	15	15		

Obj. Fun.
 $Z = 520$

(b) Iteration 1 Calculations:

		10	2	20	11	Supply
*Leave	$5-\theta$	$10+\theta$				15
	12	7	9	20		25
	$5-\theta$	15	$5+\theta$			
	θ	4	14	16	18	10
				$10-\theta$		
Demand	5	15	15	15		

(c) Iteration 1:

		$V_1=1$	$V_2=2$	$V_3=4$	$V_4=15$	Supply
$U_1=0$	10		2	20	*Enter 11	15
	-9	15		-16	4	
$U_2=5$	12		7	9	20	25
	-6	0		15	10	
$U_3=3$	4		14	16	18	10
	5		-4	-9	5	
Demand	5	15	15	15		

Obj. Fun.
 $Z = 475$

(d) Iteration 2 Calculations:

	10	2	20	11	Supply
	15- θ			θ	15
	12	7	9	20	25
	0+ θ	15		10- θ	10
5	4	14	16	18	5
Demand	5	15	15	15	

Note: A blue loop is drawn around the cells (1,2), (1,4), (2,4), and (2,2). The cell (2,4) is marked "Leave".

(e) Iteration 2:

Optimal

$V_1 = -3$ $V_2 = 2$ $V_3 = 4$ $V_4 = 11$

	10	2	20	11	Supply
$U_1 = 0$	-13	5		10	15
$U_2 = 5$	-10	10	15		25
$U_3 = 7$			-5	-5	10
Demand	5	15	15	15	

Note: Purple arcs are drawn around the cells (1,1), (1,4), (2,1), (2,4), (3,3), and (3,4).

Solution: $x_{12} = 5$, $x_{14} = 10$, $x_{22} = 10$, $x_{23} = 15$, $x_{31} = 5$, $x_{34} = 5$, the rest are zero.

Obj. Fun: $Z = 435$