



TP

Cont.

Maximization in TP

24 25 26 27 28 29 30 31

Work to do Max'n Prob 2:

Solve the foll. transp. prob. 2 max'se pft.

	Dest A	B	C	D	Spdy				
1	15	51	42	33	23	75	39	48	57
Source 2	80	42	26	81	44	10	48	64	9
3	90	40	66	60	33	0	50	24	30
Dmd	23	31	16	30	100				

Sol: ① Convert into loss matrix (by subtracting from 90)

Appointments										TC
75	39	48	57	23	9	18	18	18		
⑥ 10	48	64	⑩ 9	44	38	1	1	1	39	$39 \times 23 = 897$
0	50	24	30	33	17	24	30	-	-	$10 \times 6 = 60$
⑦ 22	31	⑬ 16	30							$48 \times 8 = 384$
6										$9 \times 30 = 270$
10	9	24	21							$0 \times 17 = 0$
										$24 \times 16 = 384$
										<u>1995</u>
10	Phones	-	21							
65	9	-	48							
-	9	-	48							
-	9	-	-							

Optimality Test

	75	39	48	57	
	74		33	57	-9
	1	(23)	15	0	
	10	48	64	9	
			40		
(6)		(8)	24	(30)	0
	0	50	24	30	
		2		21	0
(17)		48	(10)	9	
	10	48	24	9	

All $d_j \geq 0$; Hence cr. sol is optimal.

$$1 \rightarrow B \quad 23 \text{ units} \times 51 = 1173$$

$$2 \rightarrow A \quad 6 \text{ units} \times 80 = 480$$

$$2 \rightarrow D \quad 30 \text{ units} \times 81 = 2430$$

$$2 \rightarrow B \quad 8 \text{ units} \times 42 = 336$$

$$3 \rightarrow A \quad 17 \text{ units} \times 90 = 1530$$

$$3 \rightarrow C \quad 16 \text{ units} \times 66 = 1056$$

Rs 7005 \rightarrow optimum P/f.

Alternative optimal sol. 34 25 26 27 28 29 30 31

Work to do				
2	4	6	11	50
10	8	7	5	70
13	3	9	12	30
4	6	8	3	50
25	35	105	20	185 200

Appointments

VAM - IBFS

$5 + 4 - 1 = 8$ allocations

2	4	6	11	0	20	2	2	2	2	2
10	8	7	5	0	50 25	5	2	2	2	1
13	3	9	12	0	30 55	3	6	-	-	-
4	6	8	3	0	20 30	3	1	1	3	2
25	35	105	20	15	200					

Phones

2	1	2	2	0
2	1	1	2	-
2	2	1	2	-
-	2	1	2	-
-	2	1	-	-
-	-	-	-	-

TC: $25 \times 2 + 5 \times 4 + 20 \times 6 + 55 \times 7 + 15 \times 0 + 30 \times 3 + 30 \times 2 + 20 \times 3$ Work to do
 $= 50 + 20 + 120 + 385 + 0 + 90 + 60 + 60 = 965$

(1)

Optimality Test:

$30 - 0; 15 - 0; 0 = 15$

	12	14	6	11	10
				10	1
				1	-1
	10	18	12	5	10
7		3		3	-8
	3	5	25	2	5
	13	3	9	12	Appointments
12			4	12	-1
	1	30	5	0	-2
	4	6	18	3	10
0		0	-8		-1
	4	6	30	20	+8
2		4	6	1	-1

	2	4	6					Work to do
	(25)		(25)					
				7				
			(30)					
		3						
	(30)							
		6	8	3	0			
	(5)	(10)	(20)	(15)				Appointments

$$TC = 50 + 150 + 490 + 90 + 30 + 80 + 60 + 0 = \underline{\underline{950 Rs.}}$$

$$TC: 25x_2 = 50$$

$$5x_4 = 20$$

$$20x_6 = 120$$

$$70x_7 = 490$$

$$30x_3 = 90$$

$$15x_8 = 120$$

$$20x_5 = 60$$

$$15x_0 = 0$$

$$\underline{950}$$

$$25 - 0$$

$$15 - 0$$

$$0 = 15$$

② All $d_{ij} \geq 0$; Hence optimal sol; $C_1 \& C_2 \rightarrow 0$

Taking C_1 as basis

All sol exists

	12	16	16	16	10	10
Phones	0	0	0	0	0	0
	25	5	20	1	-2	0
	10	18	7	6	6	1
	7	3	3	3	1	1
	3	5	70	2	-1	
	13	13	9	12	6	
	12		4	12	3	-1
	1	30	5	0	-3	
	4	6	8	13	6	20
	0	0	0	0	0	0
	4	6	15	20	15	
	2	4	6	1	-2	

Taking $C_{3/2}$ into basis.

5-0
 15-0
 $\theta = 5$
 Phones

	2	4	6			
		-0		$+0$		
(25)	(5)	(20)				
10		8	7			
		(70)				
13		3	9			
	(30)					
4		6	8	3	0	
		$+0$		-0		
		(15)	(20)	(15)		

11 Tuesday

(3)

10 11 12 13 14 15 16 17 18 19 20 21 22
24 25 26 27 28 29 30 31

Work to do	2	4	6	11	0
TC = 20					
20	(10)	(5)	(35)		
210	10	8	7	5	0
490					
90			(70)		
100	13	3	9	12	0
60					
60+0		(30)			
<u>950</u>	4	6	8	3	0
Appointments	(15)		X	(20)	(15)

Degeneracy in IBFS

$3 + 3 - 1 = 5$ allocations Work to do

8	7	3 (60)	60	4	4	4
3 (50)	8	1 (30)	70	2	7	-
11	3 (80)	5 (E)	80	2	2	2
50	80	80 60				
5	4	2				
-	4	2				
-	4	2				

Appointments

- Allocate E to C₁₃ (least cost cell)
- TC: $180 + 150 + 20 + 240 = 590$

3	5	6	1 (60)	3	3
(50)	3	9	-1 (30)	1	1
4	11	7	3	5	5
2	7 (8)	-2	E	0	0

All di = 30,
an sol. optimal

Phones