Name: Adithya.M OR Assignment -2 VAM & MODI method

USN: 1BG17IS003

a)

2	7	4	5
3	3	1	8
5	4	7	7
1	6	2	14
7	9	18	

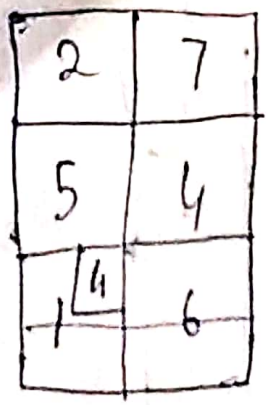
applying VAM,

2	7	4	5	[2]
3	3	1 (8)	~~8~~ 0	[2]
5	4	7	7	[1]
1	6	2	14	[1]
7	9	~~18~~ 10		

[1] [1] [1]

[1] [2] [2]

2	7	4	5	[2]
5	4	7	7	[1]
1	6	10 (2)	~~14~~	[1]
7	9	~~10~~ 0	4	



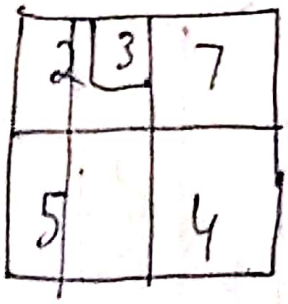
5 [5]

7 [1]

4 [5]

3 9

[1] [2]



2 [5]

7 [1]

3 9

[3] [3]

2

7

9

Total cost = $8\times1 + 10\times2 + 4\times1 + 2\times3 + 7\times2 + 4\times7$

$= 80$

Now optimize using MODI method.

	V_1	V_2	V_3
u_1	2	7	
u_2			1
u_3		4	
u_4	1		2

$u_1 + v_1 = 2$

$u_1 + v_2 = 7$

$u_2 + v_3 = 1$

$u_3 + v_2 = 4$

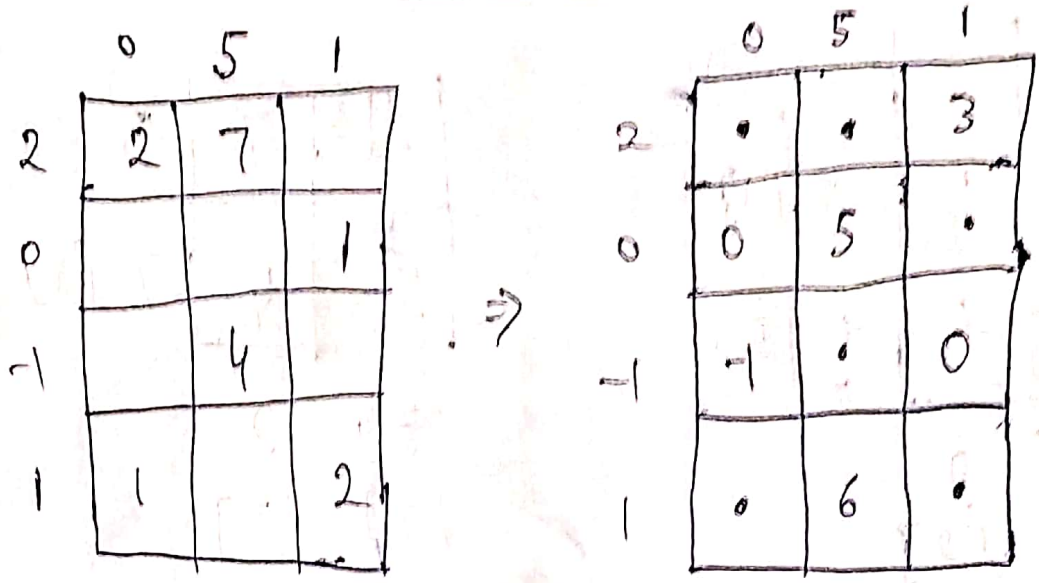
$u_4 + v_1 = 1$

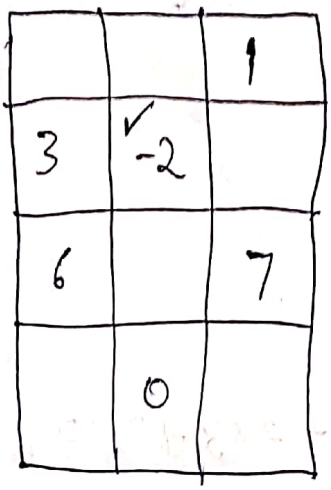
$u_4 + v_3 = 2$

Put $v_1 = 0$ $u_1 = 2$ $u_4 = 1$ $u_3 = 4 - 5 = -1$

$v_2 = 7 - 2 = 5$ $v_3 = 2 - 1 = 1$

$u_2 = 1 - 1 = 0$

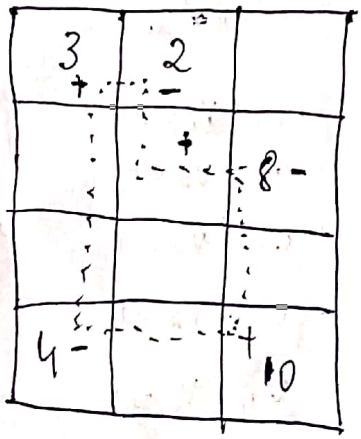




mark -2 as it is the most negative

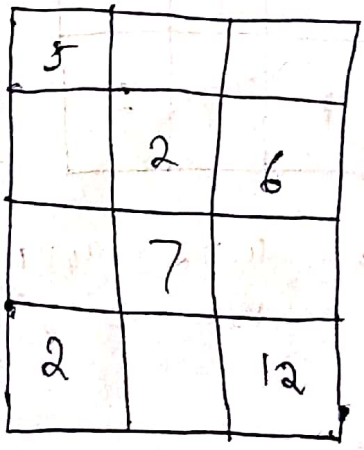
draw loop

Cell evaluation matrix I



← + or - for alloted value of cost matrix

+2 5 -2



	V_1	V_2	V_3
u_1	2 [5]		
u_2		3 [2]	1 [6]
u_3		4 [7]	
u_4	1 [2]		2 [12]

$u_1 + v_1 = 2$

$u_2 + v_2 = 3$

$u_2 + v_3 = 1$

$u_3 + v_2 = 4$

$u_4 + v_1 = 1$

$u_4 + v_3 = 2$

Let $v_1 = 0$; $u_1 = 2$

$u_4 = 1$

$v_3 = 2 - 1 = 1$ $v_2 = 3$

$u_2 = 1 - 1 = 0$ $u_3 = 4 - 3 = 1$

	0	3	1
2	2		
0		3	1
1		4	
1	1		2

$\Rightarrow$

	0	3	1
2	·	5	3
0	0	·	·
1	1	·	2
-1	·	4	·

	-	2	1
	3	·	·
	4	·	5
	-	2	·

→ All evaluation matrix II

There are no -ve values in the current all evaluation matrix, hence soln is optimal

total cost = $2 \times 5 + 3 \times 2 + 1 \times 6 + 4 \times 7 + 1 \times 2 + 2 \times 12$

$= 76$