Vogel's Approximation Method (VAM) :→ This method is also known as Unit Penalty Method.

Process :→

	D_1	D_2	D_3	D_4	Ai
O_1	1	2	1	4	30 (0)
O_2	3	3	2	10 / 1	50 (1)
O_3	4	2	5	9	20 (2)
Rj	20	40	30	10	
	(2)	(0)	(1)	(3)	

We determine the non-negative difference (or penalty) between the smallest and the second smallest cost in each row and each column.

Here the maximum of these differences for all the rows and columns is 3 in the 4th column.

So we first allocate the low cost cell in the fourth column: i.e. we allocate 10 in the (2,4) cell.

Now the next table will be:

	D_1	D_2	D_3	Ai
O_1	1	2	1	30 (0)
O_2	3	3	2	40 (1)
O_3	4	20 / 2	5	20 (2)
Rj	20	40	30	
	(2)	(0)	(1)	

Here the maximum of these differences for all the rows and the columns is 2 in the 1st column and in the 3rd row.

In this case we can choose any one of them.

We choose arbitrarily the 3rd row. So we allocate

10 in the (3,2) cell. The next table will be:

	D_1	D_2	D_3	Ai
O_1	20 / 1	2	1	30 (0)
O_2	3	3	2	40 (1)
Rj	20	20	30	
	(2)	(1)	(1)	

Here the maximum differences for all the rows and the columns is 2 in the 1st column. So we allocate 20 in the (1,1) cell.

Now the next table is:

	D_2	D_3	Ai
O_1	2	10 / 1	10 (1)
O_2	3	2	40 (1)
Rj	20	30	
	(1)	(1)	

Here we are to allocate 10 in the (1,3) cell.

The next table is:

	D_2	D_3	
O_2	20 / 3	20 / 2	40
	20	20	

∴ The initial basic feasible solution is obtained from the following table:

	D_1	D_2	D_3	D_4	Ai
O_1	20 / 1	2	10 / 1	4	30
O_2	3	20 / 3	20 / 2	10 / 1	50
O_3	4	20 / 2	5	9	20
Rj	20	40	30	10	

∴ The basic feasible solution is given by $x_{11}=20$, $x_{13}=10$, $x_{22}=20$, $x_{23}=20$, $x_{24}=10$ and $x_{32}=20$.

∴ The cost corresponding to this basic feasible solution is

$20\times1+10\times1+20\times3+20\times2+10\times1+20\times2=180$.

Problems: Find the optimal solution of the TP :→

	D_1	D_2	D_3	D_4	Ai
O_1	10	7	3	6	3
O_2	1	6	8	3	5
O_3	7	4	5	3	7
Rj	3	2	6	4	

2.

	D_1	D_2	D_3	D_4	Ai
O_1	1	2	-2	3	70
O_2	2	4	0	1	38
O_3	1	2	-2	5	32
Rj	40	28	30	42	

	D_1	D_2	D_3	D_4	
O_1	3	4	6	8	8 / 20
O_2	2	10	0	5	8 / 30
O_3	7	11	20	40	3 / 15
O_4	1	0	9	14	16 / 13
Rj	40	6	8	18	6

4.

	D_1	D_2	D_3	D_4	Ai
O_1	23	27	16	18	30
O_2	12	17	20	51	40
O_3	22	28	12	32	53
Rj	22	35	25	41	