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- 1. Determinants using Sarrus Rule on 23.10.19
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- 4. Five number summary
- 5. diagonally dominant matrix
- 6. diagonally dominant equation
- 7. set builder notation (Code improved) on 19.09.19
- 8. stem and leaf plot

Home > Operation Research calculators > Vogel's approximation method calculator

** check different types of Transportation problem examples [Algorithm and examples NEW](#)

Solve transportation problem using vogel's approximation method

Type your data, for separator you can use space or tab for sample click random button

1	2	1	20
3	4	5	40
2	3	3	30
30	20	20	

OR

Minimize Transportation Cost Maximize Profit

Supply Constraints : , Demand Constraints :

	D1	D2	D3	Supply
S1	1	2	1	20
S2	3	4	5	40
S3	2	3	3	30
Demand	30	20	20	

Initial basic feasible solution by Method :

MODI method (Optimality test)
 Stepping stone method (Optimality test)

[Solution](#) [Help](#)

Solution will be displayed step by step (In 3 parts)

Solution

Find Solution using Vogel's Approximation method

	D1	D2	D3	Supply
S1	1	2	1	20
S2	3	4	5	40
S3	2	3	3	30
Demand	30	20	20	

Solution:
TOTAL number of supply constraints : 3
TOTAL number of demand constraints : 3
Problem Table is

	D_1	D_2	D_3	Supply
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- 2. BCD To Decimal**
3. Decimal To Excess 3
4. Excess 3 To Decimal
5. Decimal To Gray code
6. Gray code To Decimal

12. Logarithmic equations
 07.08.19

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Test

S_2	3	4	5	40
S_3	2	3	3	30
Demand	30	20	20	

Here Total Demand = 70 is less than Total Supply = 90. So We add a dummy demand constraint with 0 unit cost and with allocation 20.

Now, The modified table is

	D_1	D_2	D_3	D_{dummy}	Supply
S_1	1	2	1	0	20
S_2	3	4	5	0	40
S_3	2	3	3	0	30
Demand	30	20	20	20	

Table-1

	D_1	D_2	D_3	D_{dummy}	Supply	Row Penalty
S_1	1	2	1	0	20	$1 = 1 - 0$
S_2	3	4	5	0	40	$3 = 3 - 0$
S_3	2	3	3	0	30	$2 = 2 - 0$
Demand	30	20	20	20		
Column Penalty	$1 = 2 - 1$	$1 = 3 - 2$	$2 = 3 - 1$	$0 = 0 - 0$		



The maximum penalty, 3, occurs in row S_2 .

The minimum c_{ij} in this row is $c_{24} = 0$.

The maximum allocation in this cell is $\min(40, 20) = 20$.

It satisfy demand of D_{dummy} and adjust the supply of S_2 from 40 to 20 ($40 - 20 = 20$).

Table-2

	D_1	D_2	D_3	D_{dummy}	Supply	Row Penalty
S_1	1	2	1	0	20	$0 = 1 - 1$
S_2	3	4	5	0(20)	20	$1 = 4 - 3$
S_3	2	3	3	0	30	$1 = 3 - 2$
Demand	30	20	20	0		
Column Penalty	$1 = 2 - 1$	$1 = 3 - 2$	$2 = 3 - 1$	--		

The maximum penalty, 2, occurs in column D_3 .

The minimum c_{ij} in this column is $c_{13} = 1$.

The maximum allocation in this cell is $\min(20, 20) = 20$.

It satisfy supply of S_1 and demand of D_3 .

Table-3

	D_1	D_2	D_3	D_{dummy}	Supply	Row Penalty
S_1	1	2	1(20)	0	0	--
S_2	3	4	5	0(20)	20	$1 = 4 - 3$
S_3	2	3	3	0	30	$1 = 3 - 2$

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Column Penalty	1 = 3 - 2	1 = 4 - 3	--	--		
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The maximum penalty, 1, occurs in row S_3 .

The minimum c_{ij} in this row is $c_{31} = 2$.

The maximum allocation in this cell is $\min(30, 30) = 30$.
It satisfy supply of S_3 and demand of D_1 .

Table-4

	D_1	D_2	D_3	D_{dummy}	Supply	Row Penalty
S_1	1	2	1(20)	0	0	--
S_2	3	4	5	0(20)	20	4
S_3	2(10)	3	3	0	0	--
Demand	0	20	0	0		
Column Penalty	--	4	--	--		

The maximum penalty, 4, occurs in row S_2 .

The minimum c_{ij} in this row is $c_{22} = 4$.

The maximum allocation in this cell is $\min(20, 20) = 20$.
It satisfy supply of S_2 and demand of D_2 .



Initial feasible solution is

	D_1	D_2	D_3	D_{dummy}	Supply	Row Penalty
S_1	1	2	1(20)	0	20	1 0 -- --
S_2	3	4(20)	5	0(20)	40	3 1 1 4
S_3	2(30)	3	3	0	30	2 1 1 --
Demand	30	20	20	20		
Column Penalty	1	1	2	0		
	1	1	2	--		
	1	1	--	--		
	--	4	--	--		

The minimum total transportation cost = $1 \times 20 + 4 \times 20 + 0 \times 20 + 2 \times 30 = 160$

Here, the number of allocated cells = 4, which is two less than to $m + n - 1 = 3 + 4 - 1 = 6$
 \therefore This solution is degenerate

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