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 seperator 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 : 3 , Demand Constraints : 3 Generate

	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 : 3. Vogel's approximation method

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

Find Random New

Solution Help

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

Solution

Find Solution using Voggel'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

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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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

Column Penalty	1 = 3 - 2	1 = 4 - 3	--	--		

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**(30)**	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 1 --	1 1 1 4	2 2 -- --	0 -- -- --		

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

Solution provided by AtoZmath.com

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