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Ramifications of SS Method

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Abstract: ***This paper discusses about ramifications of SS method as propounded by A. Seethalakshmy and Dr. N. Srinivasan (2016) [2] SS method does not give optimal solution in some transportation problems whereas MODI method[1]proves itself effective invariably in all cases . Two counter examples are given in this paper to prove this assertion.***

Keywords: Transportation problem, optimal solution, transportation cost, SS method, MODI method

1. Introduction

As by Hamdy.A.Taha[3],Transportation problem deals with transportation of single commodity from fixed number of sources to a fixed number of destinations ,given the level of supply at each source , amount of demand at each destination and the unit transportation cost of the commodity from each source to each destination. The objective of the transportation problem is to determine the amount to transported from each source to each destination, such that the total transportation cost is minimized.

Transportation problem can be represented as a LPP as follows

Minimize : Z =

$$\sum_{i=1}^{m}\sum_{j=1}^{n} cij\ xij$$

Subject to
$\sum_{j=1}^{n} xij \leq ai$, i=1,2,3....m
$\sum_{i=1}^{m} xij \geq bj$, j=1,2,3.....n
$X_{ij} \geq 0$ for all i,j
i=1,2,3...,m is the set of sources.
J=1,2,3,...n is the set of destinations.
ai = availability of material at i^{th} source.
bj = requirement of material at J^{th} destination
cij =cost of transportation of one unit of material from ith source to jth destination .
xij = number of units of material to be transported from ith source to jth destination.

2. Numerical Examples

Example 1: Transportation model of problem is given below

Destinations

Sources	D	E	F	G	H	supply
A	8	8	9	4	3	800
B	5	8	5	11	6	500
C	8	9	7	3	3	900

Requirements 400 350 300 250 900 2200

Solution of transportation problem using MODI method
Optimal solution of the problem by MODI method is represented in the following table

Destinations

	D	E	F	G	H	supply
A	8	$8_{(350)}$	9	4	$3_{(450)}$	800
B	$5_{(400)}$	8	$5_{(100)}$	11	6	500
C	8	9	$7_{(200)}$	$3_{(250)}$	$3_{(450)}$	900

Req. 400 350 300 250 900

Total transportation cost
8*350+3*450+5*400+5*100+7*200+3*250+3*450
=Rs. 10,150

Solution of transportation problem using the SS method
Optimal solution of transportation problem by SS method is represented in the following table

Destinations

Source	D	E	F	G	H	Supply
A	8	8	9	4	$3_{(800)}$	800
B	$5_{(400)}$	8	$5_{(100)}$	11	6	500
C	8	$9_{(350)}$	$7_{(200)}$	$3_{(250)}$	$3_{(100)}$	900
Req.	400	350	300	250	900	2200

Total transportation cost
=3*800+5*400+5*100+9*350+7*200+ 3*250+3*100
=Rs. 10,500

Example 2: Transportation model of a problem is given below

Destinations

Source	D1	D2	D3	D4	Supply
S1	6	1	9	3	70
S2	11	5	2	8	55
S3	10	12	4	7	90
Req.	85	35	50	45	215

Optimal solution of the problem by MOD1 method is represented in the following table.

Destinations

Source	D1	D2	D3	D4	Supply
S1	$6_{(40)}$	$1_{(30)}$	9	3	70
S2	11	$5_{(5)}$	$2_{(50)}$	8	55
S3	$10_{(45)}$	12	4	$7_{(45)}$	90
Req.	85	35	50	45	215

Total transportations cost
=6*40+1*30+5*5+2*50+10*45+7*45
=Rs.1,160.

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Optimal solution of the problem by SS method is represented in the following table.

Destinations

Source	D1	D2	D3	D4	Supply
S1	6	$1_{(35)}$	9	$3_{(35)}$	70
S2	11	5	$2_{(50)}$	$8_{(5)}$	55
S3	$10_{(85)}$	12	4	$7_{(5)}$	90
Req.	85	35	50	45	215

Total transportation cost
=1*35+3*35+2*50+8*5+10*85+7*5
=Rs.1,165.

3. Result Analysis

Above examples show that in some cases optimal solution is only given by MODI method and not by SS method. The comparison table of the solutions given by both the methods is given below.

	Total Transportation Cost	
Methods	Example 1	Example 2
MODI	Rs. 10150	Rs.1160
S S	Rs.10500	Rs.1165

4. Conclusion

Above noted study proves that SS method cannot be an alternative to MODI method for finding optimal solution of a transportation problem.

References

[1] Dantzig G.B ,Linear programming and extentions. Princeton university press,Princeton,NJ,1963.
[2] Seethalakshmy A.,Srinivasan N. , A Direct method to obtain an optimal solution in the transportation problem, International Journal of Advanced Research,4(10),473-477,2016.
[3] Hamdy A.T. , operations Research: An introduction, 8th edition, Pearson Prentice Hall,New Delhi,2007.
[4] Gupta P.K , Hira D.S , Operations Research, S. Chand & company limited, 6th Edition,2011.

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