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Implications of Advanced Method

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Abstract: ***This paper discusses the implications of Advanced method for finding the optimal solution of transportation problem. Advanced method[2] does not give a solution nearly comparable to MODI method as claimed by Reena G Patel and P.H.Bathwala.In most of the transportation problems difference between the transportation costs given by both the methods are very high.. MODI method proved itself effective invariably in all cases till now. Even in most of the cases VAM gives a better feasible solution than Advanced Method.Two counter examples are given in this paper to prove this point.***

Keywords: VAM , Transportation problem

1. Introduction

As by Hamdy.A.Taha[3],Transportation problem is a special type of LPP where the objective is to minimize the cost of distributing a commodity from fixed number of sources to a fixed number of destinations.Let there are m sources $S_1, S_2, \_\_\_\_\_, S_m$ and n destinations $D_1, D_2, D_3, \_\_\_\_, D_n$.

Transportation problem can be represented mathematically as 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
ai = quantity of commodity available at origin i
bj = requirement of commodity at destination j
cij =cost of transportation of one unit of commodity from ith source to jth destination .
xij = number of units of commodity 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	supply
A	8	10	7	6	50
B	12	9	4	7	40
C	9	11	10	8	30

Requirement 25 32 40 23 120

Solution of the problem by Advanced method is represented in the following table

Destinations

Sources	D	E	F	G	Supply
A	$8_{(10)}$	10	$7_{(40)}$	6	50
B	12	$9_{(17)}$	4	$7_{(23)}$	40
C	$9_{(15)}$	$11_{(15)}$	10	8	30

Requirement 25 32 40 23 120

Total transportation cost
8*10+7*40+9*17+7*23+9*15+11*15
=Rs. 974

Solution of transportation problem by VAM is represented in the following table

Sources	D	E	F	G	Supply
A	$8_{(25)}$	$10_{(2)}$	7	$6_{(23)}$	50
B	12	9	$4_{(40)}$	7	40
C	9	$11_{(30)}$	10	8	30

Requirements 25 32 40 23 120
Total transportation cost
=8*25+10*2+6*23+4*40+11*30
=Rs. 848

Solution of problem by MODI method is represented in the following table

Sources	D	E	F	G	Supply
A	$8_{(25)}$	$10_{(2)}$	7	$6_{(23)}$	50
B	12	9	$4_{(40)}$	7	40
C	9	$11_{(30)}$	10	8	30

Requirements 25 32 40 23 120
Total transportation cost=8*25+10*2+6*23+4*40+11*30=Rs.848

Example 2: Transportation model of a problem is given below

Destinations

Source	D1	D2	D3	D4	Supply
S1	65	45	35	75	150
S2	60	55	20	80	200
S3	60	50	30	85	130
Req.	110	120	150	100	480

Solution of the problem by Advanced method is represented in the following table.

Destinations

source	D1	D2	D3	D4	Supply
S1	65	45	$35_{(50)}$	$75_{(100)}$	150
S2	60	$55_{(100)}$	$20_{(100)}$	80	200
S3	$60_{(110)}$	$50_{(20)}$	30	85	130
Req.	110	120	150	100	480

Total transportations cost
=35*50+75*100+55*100+20*100+60*110+50*20

=Rs.24,350

Solution of the problem by VAM is reprensented in the following table

Destinations

Source	D1	D2	D3	D4	Supply
S1	65	$45_{(120)}$	35	$75_{(30)}$	150
S2	60	55	$20_{(150)}$	$80_{(50)}$	200
S3	$60_{(110)}$	50	30	$85_{(20)}$	130
Req.	110	120	150	100	480

Total transportation cost=
45*120+75*30+20*150+80*50+60*110+85*20
=Rs22,950

Solution of the problem by MODI method is represented in the following table

Source	D1	D2	D3	D4	Supply
S1	65	$45_{(100)}$	35	$75_{(50)}$	150
S2	60	55	$20_{(150)}$	$80_{(50)}$	200
S3	$60_{(110)}$	$50_{(20)}$	30	85	130
Req.	110	120	150	100	480

Total transportation cost=
45*100+75*50+20*150+80*50+60*110+50*20=Rs 22,850

3. Result Analysis

Above examples contradicts the claim of Reena.G.Patel and P.H.Bhathwala. The comparison table of the solutions given by Advanced,VAM and MODI methods is given below.

Methods	Total transportation cost(in Rs)	
	Example1	Example2
Advanced	974	24,350
VAM	848	22,950
MODI	848	22,850

4. Conclusion

Above noted study proves that Advanced method is not comparable to MODI method for finding optimal solution of a transportation problem.

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