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MINIMAX PRINCIPAL TO FIND INITIAL BASIC FEASIBLE SOLUTION OF TRANSPORTATION PROBLEMS

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Abstract:- This paper is an attempt to find initial basic feasible solution of transportation problems. In this method first we give allocation at minimum of the maximum of supply and demand and cancelling the row or column which ever is satisfied and continue until whole supply and demand is satisfied. This method is easy to apply.

Introduction:- Transportation problems was invented by Hitchcock in 1941 and was further developed by Koopman in 1949 and Dantzig in 1951. Many authors have given different methods for finding initial basic feasible solution such as north west corner rule, least cost entry method and VAM method.In 2014 Babu et al .developed a new algorithm known as Implied cost method (ICM) where initial feasible solutions are smaller than solution found by Vogel's approximationmethod and are closer to optimal solution. In 2014 Das et al. discussed about advanced Vogel's method in which they established a new algorithm for solving (TP) when two or more least costs in a row or column are equal. In 2015 Soomro et al. explained about modified Vogel's approximation method for solving transportation problems in which penalty of each horizontal line is obtained by calculating difference between two highest costs of that line but method for calculating penaltyof a column is same as in Vogel's approximation method.In this paper I have proposed minimax principle to find initial basic feasible solution of the transportation problems.

Algorithm of proposed method:-1. Write down the transportation problem in the form of the following table:

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Table 1

Destination→ Source↓	**D_1**	***D_2***	**…**	**D_n**	**Supply(a_i)**
S_1	C_{11}	C_{12}	…	C_{1n}	a_1
S_2	C_{21}	C_{22}	…	C_{2n}	a_2
:	:				
S_m	C_{m1}	C_{m2}	…	C_{mn}	a_m
Demand (b_j)	b_1	b_2	…	b_n	

2. Balance the problem by adding dummy row or column if necessary in order to make supply equal to demand.

3. Select the row of maximum supply and column of maximum demand.

4. Take minimum of the above two maxima.

5. Make the allocation at least cost in(row or column) where this minima occurs.

6. If there is tie at step 3 then give allocation in row or column where the cost is least.

7. Cross the row or column whichone is satisfied.

8. Repeat the process until each row and column is satisfied.

Numerical example: Find initial basic feasible solution of the transportation problem given in table2 by proposed method.

Table 2

	A	B	C	Supply(a_i)
a	14	15	10	20
b	21	13	19	24
c	17	26	9	12
Demand (b_j)	28	22	6	56

-

Solution:-After applying the above algorithm we find that initially an amount of 22 is allocated at (2,2)th place then an amount 6 is allocated at (1,3)th place, amount of 14 at (1,1)th place, amount of 12 at (3,1)th place and at last amount 2 is allocated at (2,1)th place and initial solution is 788 as shown in the following table

Ex.	Input data	Obtained allocations by proposed method	Initial basic feasible solution
	$[c_{ij}]3\times3$=[14,15,10; 21,13,19; 17,26,9] ; [ai]3×1=[20, 24, 12]; [bj]1×3=[28, 22, 6]	X_{22}=22, x_{13}=6,x_{11}=14,x_{31}=12, X_{21}=2	788

Conclusion:- We have concluded that this method is to apply and frequently provides initial solution.

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