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UNCLEAR CARRYING PROBLEM OF TRIANGULAR NUMBERS WITH α – SLASH AND POSITION METHOD

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ABSTRACT

The aim of unclear carrying is to discover the smallest amount carrying cost of some property through a capacitated set of connections at what time the supply and authority of nodes and the ability and cost of boundaries are stand for as unclear numbers. Arithmetic operations, alpha level and straightforward position by operation. to conclude everyone these investigate papers present the solutions of FTP by alpha level, simple ranking method and alpha level standard value. In this paper we are presenting a ranking technique with alpha optimal solution for solving fuzzy transportation problem, where fuzzy demand and supply all are in the form of triangular fuzzy numbers.

Keywords: *Fuzzy Transportation Problem, Triangular fuzzy numbers, α- optimal solution, Roubast Ranking Method.*

INTRODUCTION

A fuzzy transportation problem is a transportation problem in which the transportation cost, supply and demand quantities are fuzzy quantities. The objective of the fuzzy transportation problem is to determine the shipping schedule that minimizes the total fuzzy transportation cost while satisfying fuzzy supply and demand limits. In this paper we investigate more realistic problems, namely the transportation problem with fuzzy costsaij. Since the objective is to minimize the total cost or to maximize the total profit, subject to some fuzzy constraints, the objective function is also considered as a fuzzy number. The method is to rank the fuzzy objective values of the objective function by some ranking method for numbers to find the best alternative. On the basis of this idea the Roubast Ranking method [7] with the help of α solution has been adopted a transform the fuzzy transportation problem. The idea is to transform a problem with fuzzy parameters in the form of Linear programming problem and solve it by the Vogel Approximation Method.

PRELIMINARIES

Zadeh [9] in 1965 first introduced unclear set as a mathematical way of representing impreciseness or vagueness in everyday life. unclear set: A unclear set is characterized by a membership function mapping element of a domain, space or universe of discourse X to the unit interval [0, 1] i.e. A = {(x, $\mu_A(x)$; x∈X}, Here μ_A: X → [0, 1] is a mapping called the degree of membership function of the fuzzy set A and $\mu_A(x)$ is called the membership value of x∈X in the unclear set A. These association grades are often represented by real numbers ranging from [0,1].

TRIANGULAR UNCLEAR NUMBER

For a triangular unclear number A(x), it can be represented by A (a, b, c; 1) with membership function μ(x) given by

$$\begin{cases} (x-a)/(x-b) & a \le x \le b \\ 1, & x = b \\ (c-x)/(c-d) & c \le x \le d \\ 0, & otherwise \end{cases}$$

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Robust Ranking Technique: Roubast ranking technique which satisfy compensation, linearity, and additively properties and provides results which are consist human intuition. If ã is a fuzzy number then the Roubast Ranking is defined by R(ã) = 0.5 $(a\alpha La\boldsymbol{\alpha}U10)d\alpha$, where $a\alpha La\alpha U$ is the α level cut of the fuzzy number ã In this paper we use this method for ranking the objective values. The Roubast ranking index R(ã) gives the representative value of fuzzy number ã.

Numerical Example: A company has four sources S_1, S_2, S_3 and S_4 and four destinations D_1, D_2, D_3 and D_4; the fuzzy transportation cost for unit quantity of the product from i^{th} source to j^{th} destination is C_{ij} where

$$[c_{ij}]_{4x4} = \begin{bmatrix} (5,10,15) & (7,12,17) & (10,15,20) & (3,8,13) & (125,130,135) \\ (9,14,19) & (6,11,16) & (4,9,14) & (5,10,15) & (140,150,160) \\ (15,20,25) & (0,5,10) & (2,7,12) & (13,18,23) & (165,170,125) \\ (85,90,95) & (95,100,105) & (135,140,145) & (115,120,125) & \end{bmatrix}$$

Solution: Using Vogel's approximation method, an initial basic feasible solution is given in table 15.44. Using MODI method, the optimum solution is given in table 15.45. The optimum allocation schedule is :

From P transfer 90 gallons to a and 40 gallons to D; from Q transfer 70 gallons to C and 80 gallons to D; from R transfer 100 gallons to B and 70 gallons to c. Minimum cost thus, involved is Rs.3,640.

					u_i
	90 / 10	12	15	40 / 8	130
	14	11	70 / 9	80 / 10	150
	20	100 / 5	70 / 17	18	170
ϑj	90	100	140	120	

Table-15.44

					u_i
	90 / 10	(-ve) 12	(-ve) 15	40 / 8	0
	(-ve) 14	(-ve) 11	70 / 9	80 / 10	2
	(-ve) 20	100 / 5	70 / 17	(-ve) 18	0
ϑj	10	5	7	8	

Table-15.45

In Conformation now before representation the unclear transport difficulty preserve be formulate in the subsequent numerical programming structure

Min Z = $R(5,10,15)x_{11}$ + $R(5,10,20)x_{12}$ + $R(5,15,20)x_{13}$ + $R(5,10,15)x_{14}$ + $R(5,10,20)x_{21}$ + $R(5,15,20)x_{22}$ + $R(5,10,15)x_{23}$ + $R(5,10,20)x_{24}$ +$R(5,10,20)x_{31}$ + $R(10,15,20)x_{32}$ + $R(10,15,20)x_{33}$ + $R(5,10,15)x_{34}$ + $R(10,15,25)x_{41}$ + $R(5,10,15)x_{42}$ + $R(10,20,30)x_{43}$ + $R(10,15,25)x_{44}$

$$R\left(\bar{a} = \int_0^1 \right)\left(0.5\left(a_\alpha^L, a_\alpha^U\right)d\alpha\right)$$

Where

$$\left(a_\alpha^L, a_\alpha^U\right) = \{(b-a)\alpha + a, c - (c-b)\alpha\}$$

$$R(5,10,15) = \int_0^1 (0.5)(5\alpha + 5, 15 - 5\alpha)\,d\alpha$$

$$R(5,10,15) = \int_0^1 (0.5)(20)\,d\alpha = 10$$

Similarly
R(5,10,20)=11.25, R(5,15,20)=13.75, R(5,10,15)=10, R(5,10,20)=11.25, R(5,15,20)=13.75, R(5,10,15)=10, R(10,15,20)=15, R(5,10,20)=11.25, R(10,15,20)=15, R(10,15,20)=15, R(5,10,15)=10, R(10,15,25)=16.25, R(5,10,15)=10, R(10,20,30)=20, R(10,15,25)=16.25.

CONCLUSION

The transport expenses be measured as vague numbers describe by fuzzy numbers which are more realistic and general in nature. Moreover, the unclear carrying difficulty of triangular numbers contain been changed into crisp transportation problem using Robust’s position index. Numerical examples demonstrate that by this method we can have the optimal explanation as glowing as the crispy and unclear most favorable entirety charge. through using Robust’s position method we have shown that the entirety price tag obtained is best possible. besides, one can terminate that the result of fuzzy troubles can be obtain by Robust’s standing method in actual fact. This procedure can also be use in solving other types of troubles like, project schedules, assignment problems and network flow problems.

REFERENCES

[1] Lin, Feng_Tse and Tsai, Tzong Ru: “A two stage genetic algorithm for solving the transportation problem with fuzzy demands and fuzzy supplies”, Int. J. of innovative computing information and control. Vol.5. (2009).
[2] Liu, Shiang-Tai and Chiang, Kao: “Solving fuzzy transportation problems based on extension principle”, European Journal of Operational Research, 153, pp 661–674 (2004).
[3] Pandian, P. and Natrajan, G.: “An optimal More for less solution to fuzzy transportation problem with mixed constraints’’ Applied mathematical sciences, vol.4, no.29, 1405-1415 (2010).
[4] Pandian, P. and Natrajan, G.: “A new algorithm for finding a fuzzy optimal solution for fuzzy transportation problem’’, applied mathematical sciences, vol.4, No.2, 79-90 (2010).
[5] R.R.Yager, “A procedure for ordering fuzzy subsets of the unit interval”, Information Sciences, 24, 143-161 (1981).
[6] Ritha, W. and Vinotha, J. Merline: “Multi-objective two stage fuzzy transportation problem”, journal of physical science, vol. 13, pp 107-120 (2009).
[7] R. Nagarajan and A.Solairaju: “Computing Improved Fuzzy Optimal Hungarian Assignment Problems with Fuzzy Costs under Robust Ranking Techniques” international journal of computer application, Vol 6, no. 4 (2010).
[8] Sonia, and Malhotra, Rita: “A polynomial algorithm for a two stage time minimizing transportation problem”, OPSEARCH, 39, n0.5 and 6, pp 251-266 (2003).
[9] Zadeh, L. A: “Fuzzy sets, Information and Control”, 8, pp 338–353 (1965).

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