International Journal of Science and Research (IJSR)
ISSN (Online): 2319-7064
Index Copernicus Value (2013): 6.14 | Impact Factor (2013): 4.438

Ranking of Heptagon Number using Zero Suffix Method

Dr. S. Chandrasekaran[1], G. Kokila[2], Junu Saju[3]

[1]Associate Professor and Head, PG & Research Department of Mathematics, KhadirMohideen College, Adirampattinam – 614 701

[2, 3]KhadirMohideen College, Adirampattinam – 614 701

Abstract: ***A ranking method based on heptagon fuzzy numbers used to a transportation problem with fuzzy quantities in this process. Any transportation problem can be converted in to get on optimal solution by this ranking procedure we find the optimal solution for fuzzy transportation problem by using zero suffix method.***

Keywords: Ranking, Heptagon Fuzzy numbers, Zero suffix method.

1. Introduction

A Fuzzy Transportation problem is a transportation problem in which the transportation costs, requirement and available are fuzzy quantities. The transportation problem is one of the earliest applications of LPP.

In section 2 preliminaries and section 3 for ranking procedure and formula then finally discuss numerical example for heptagon numbers.

In this work, we justify the realistic problems, for example the transportation with fuzzy costs. The method is to rank the crisp values of the objective function by some ranking method for numbers to compute equal example. The concept is to modify a problem with fuzzy variables in the form of linear programming problem and solve it by the zero suffix method.

2. Preliminaries

2.1Definition

Let A be a classical set $\mu_A(x)$ be a real value function defined from R → [0,1]. A fuzzy set A^* with the function $\mu_A(x)$ is defined by $A^* = \{(x, \mu_A(x)): x \in A \text{ and } \mu_A(x) \in [0,1]\}$. The function $\mu_A(x)$ is known as the membership function.

<u>Definition</u>

A fuzzy number is a convex normalized fuzzy set of the real line R whose membership function is piecewise continuous.

3. Ranking of Heptagon Fuzzy Number

Let $\tilde{A}_{hep} = (a_1, a_2, a_3, a_4, a_5, a_6, a_7)$ and $\tilde{E}_{hep} = (e_1, e_2, e_3, e_4, e_5, e_6, e_7)$ be two heptagon fuzzy numbers , then

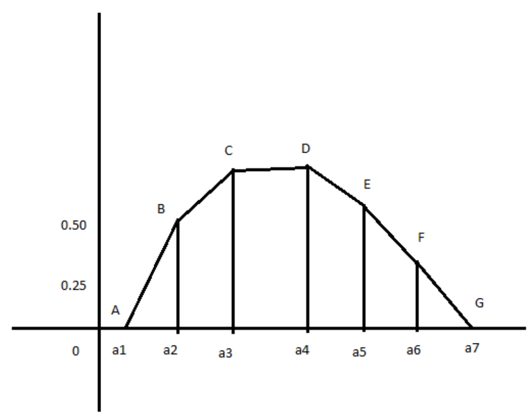
$\tilde{A}_{hep} \approx \tilde{E}_{hep} \Leftrightarrow R(\tilde{A}_{hep}) = R(\tilde{E}_{hep})$
$\tilde{A}_{hep} \geq \tilde{E}_{hep} \Leftrightarrow R(\tilde{A}_{hep}) \geq R(\tilde{E}_{hep})$
$\tilde{A}_{hep} \leq \tilde{E}_{hep} \Leftrightarrow R(\tilde{A}_{hep}) \leq R(\tilde{E}_{hep})$

In this paper for a heptagon fuzzy number is $\tilde{A}_{hep} = (a_1, a_2, a_3, a_4, a_5, a_6, a_7)$ a ranking method is from the following formula.

$$R(\tilde{A}_{hep}) = \frac{a_1 + a_2 + a_3 + a_4 + a_5 + a_6 - a_7}{5}$$

$\rightarrow 1$

4. Graphical Representation



5. Numerical Example

Consider the following transportation problem

	D	E	F	**Supply**
A	(3,6,2,1,5,0,4)	(2,3,1,4,3,6,5)	(2,4,3,1,6,5,2)	**(3,2,1,4,5,0,1)**
B	(2,7,7,6,3,2,1)	(1,3,5,7,9,11,13)	(0,1,2,4,6,0,5)	**(2,2,1,2,1,1,0)**
C	(3,6,3,2,1,8,7)	(3,4,3,2,1,1,0)	(2,4,6,8,10,12,14)	**(2,4,3,1,6,5,2)**
Demand	**(0,4,6,4,6,2,0)**	**(2,7,7,6,3,2,1)**	**(0,1,2,4,6,0,5)**	

Applying Ranking formula (1) and using Zero Suffix Method we get

	D	E	F	Supply
A	[4.4] 2.6	[1.2] 2.8	3.8	**5.6**
B	5.2	[0.2] 4.6	[1.6] 1.6	**1.8**
C	3.2	[3.8] 2.8	5.6	**3.8**
Demand	**4.4**	**5.2**	**1.6**	

Therefore the total cost is **28.92**

6. Conclusion

Thus we have obtained an optimal solution for a fuzzy transportation problem using heptagon fuzzy number .A new approach called zero suffix method is to find the optimal solution also discussed. This method is very easily approach comparing to other method to solve fuzzy problem.

References

[1] Zadeh.L.A , "Fuzzy sets" , "Information and Control", 8 (1965),pp 338-353.
[2] FegadeM.R.Jadhav V.A., Muley A.A., "Solution of multi-objective, transportation problem using zero suffix and separation method", International e-journal of Mathematics and Engineering, 118(2011) pp.1091-1098.
[3] Rajarajeshwari.P and SahyaSudha.A and Karthika.R, A new operation on hexagonal fuzzy number, International journal of Fuzzy logic systems (IJFLS) Vol.3, No.3 july 2013.
[4] G.Nirmala and R.Anju, An application of fuzzy quantifier in sequencing problem with fuzzy ranking method, Aryabhatta journal of mathematics and informatics, Vol.6,No.1,Jan-jul 2014.
[5] G.Nirmala and G.Suvitha, Implication relations in fuzzy propositions, Aryabhatta journal of Mathematics and informatics, Vol.6, No.1, Jan-jul 2014.
[6] G.Nirmala and N.Vanitha, Making model by applying fuzzy numbers in construction project , International journal of scientific research publication, Vol.4, issue 8, 6th edition Aug 2014.
[7] Abdul Quddoos et al. A new method for finding an optimal solution for Transportation problems International journal on Computer science and Engineering(IJCSE)Vol.4 No.07, July2012.
[8] Zimmermann.H.J., Fuzzy programming and Linear Programming with several objective functions, Fuzzy sets and systems, (1978),45-55.
[9] Zimmermann.J.,(1985) Application of Fuzzy set Theory to Mathematical programming .
[10] P.Pandian and G.Nagarajan, A new algorithm for finding a fuzzy optimal solution for fuzzy transportation problem, Applied mathematicalsciences,4(2010), 79-90.
[11] H.Bazirzadeh, An approach for solving fuzzy transportation problem, Applied Mathematical Sciences, 5(32) 1549-1566.
[12] G.Nirmala and R.Anju , An application of Fuzzy quantifier in fuzzy transportation problem.
[13] A.Karpagam and P.Sumathi, New approach to solve fuzzy linear programming problems by the ranking function.