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Generalized a New Alternate Approach to solve Interval Linear Assignment Problem

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Abstract :*In this paper, we discussed about the new alternate interval linear assignment problem. Now change the interval length for two cases (i.e.,) equal length, n, n+1, n+2… Different length of the interval cost matrix. We conclude that the same optimal assignment and mid value.*

Keywords : *Assignment Problem, alternate interval linear assignment problem,Interval,* M.Sc.Code : 90B80

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I. Introduction

Mansi, S.G. (2011) introduced a study on transportation problem, transshipment problem, assignment problem and supply chain management. A Seethalakshmy, Dr.N. Srinivasan (2016) developed a new methodology for solving a maximization assignment problem. Sarangam Majumdar (2013) introduced an interval linear assignment problem. Dr. A. Ramesh Kumar and S. Deepa extended a new approach to solve interval linear assignment problem. Here the new alternate interval linear assignment problem has been proposed to handle such type of problem. We solved one example problem using these two cases for proposed method. Corresponding results are computed and has been reported here. In Section 2 the detail of new interval linear assignment problem are presented and section 3 example problem is solved and result is analyzed. Finally conclusions are drawn in section 4.

II. New Alternate Method Of Interval Linear Assignment Problem

Let A, B, C, D, E denotes resources and I, II, III, IV, V denotes activities.

Step 1 :

Find out the mid values of each interval in the two different cases of the cost matrix.

(i) Equal length of cost matrix.
(ii) n, n+1, n+2, n+3, ... different length of the cost matrix etc.,

Step 2 :

We write two columns, column I represents resource and column II represented an activities.

Step 3 :

Find minimum interval of unit cost for each row whichever minimum value is available in the respecting column, select it and write it in term of activities under column Ii continue this process.

Step 4 :

(i) For each resource, if there is unique activity then assigned that activity for the corresponding resource, hence we obtained optimal solution.
(ii) If there is no unique activity for corresponding resources then we go to step 5.

Step 5 :

If any one resource has unique activity, then assign that activity for the corresponding resource. Next delete that row and its corresponding column. therwise, check which rows have only one same activity. Next find difference between minimum and next minimum cost for all those rows which have same activity, which activity has maximum difference. Delete those rows and corresponding columns.

Step 6 :

Continue this process, until resource has assigned unique activity.

III. Numerical Results :

Example 3.1

We take an assignment problem discussed by Mansi, S.G. [1]. The assignment cost of assigning any employee to any one job is given in the following table.

Table 1 : Data matrix with crisp entries

	Activities (Jobs)				
	I	**II**	**III**	**IV**	**V**
Resources (employees)	10	5	13	15	16
	3	9	18	13	6
	10	7	2	2	2
	7	11	9	7	12
	7	9	10	4	12

Now we are applying New Alternate Method then we get an optimal assignment as A, B, C, D, E employees are assigned to II, I, V, III, IV jobs respectively and minimum assignment cost is 23.

Now change the entry of the cost matrix by some interval form [(i.e.,) (i) equal length of the cost matrix)].

Table 2 : Data Matrix with Interval Form

	Activities (Jobs)				
	I	**II**	**III**	**IV**	**V**
A	[9, 11]	[4, 6]	[12, 14]	[14, 16]	[15, 17]
B	[2, 4]	[8, 10]	[17, 19]	[12, 14]	[5, 7]
C	[9, 11]	[6, 8]	[1, 3]	[1, 3]	[1, 3]
D	[6, 8]	[10, 12]	[8, 10]	[6, 8]	[11, 13]
E	[6, 8]	[8, 10]	[9, 11]	[3, 5]	[11, 13]

(ii) n, n+1, n+1, ….. different length of the cost matrix.

Table 3 : Data Matrix with Interval Form

	Activities (Jobs)				
	I	**II**	**III**	**IV**	**V**
A	[9, 11]	[3, 7]	[10, 16]	[11, 19]	[11, 21]
B	[2, 4]	[7, 11]	[15, 21]	[9, 17]	[1, 11]
C	[9, 11]	[5, 9]	[-1, 5]	[-2, 6]	[-3, 7]
D	[6, 8]	[9, 13]	[6, 12]	[3, 11]	[7, 17]
E	[6, 8]	[7, 11]	[7, 13]	[0, 8]	[7, 17]

We are applying the New Alternate Interval Linear Assignment problem and solve this problem. We get an minimum assignment (i) equal length of the cost is [18, 28] and (ii) n, n+1, n+2, . . . different length of the cost is [8, 38] and both case is same optimal assignment in A, B, C, D, E. Employees are assigned to II, I, V, III, IV jobs respectively.

IV. Conclusion

The new alternate interval linear assignment problem is effective and useful in this interval context. Using this method we can solve real world linear assignment problems where entries of the cost matrix.

References

[1]. Mansi, S.G. (2011) "A Study on Transportation Problem, Transhipment Problem, Assignment problem and Supply Chain Management" a Ph.D. Theseis at Saurashtra University.

[2]. Seethalakshmy, A., Srinvasan, N. Dr. (2016) "A New Methodology for Solving a Maximization Assignment Problem", International Journal of Latest Research in Science and Technology, Vol.5, pp.10-13.

[3]. Sarangam Majumdar (2013) "Interval Linear Assignment Problems", Universal Journal of Applied Mathematics, 1(1) : 14-16.

[4]. Ramesh Kumar, A and Deepa, S. (2014) "A new approach to solve interval linear Assignment Problem", Aryabhatta Journal of Mathematics and Informatics, Vol.6, No.2.

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