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New Proposed Method for Solving Assignment Problem and Comparative Study with the Existing Method

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Abstract - *An assignment problem concerns as to what happens to the effectiveness function when we associate each of a number of origins with each of the same number of destinations. Each resources or facility is to be associated with one and only one job and associations are to be made in such a way so as to minimize the total effectiveness. The optimum allocation for balanced assignment problem is discussed here. In this paper, as a method to bring efficiency to solve assignment problems with new technique is formulated. One problem is illustrated using new method and result is compared to Hungarian method.*

***Key Words*: Assignment problem, optimum solution, Numerical comparison, Hungarian Method, zero assignment**

1. INTRODUCTION

The assignment problem is a special case of transportation problem in which the objective is to assign a number of resources to the equal number of activities at a minimum

1.1 PROPOSED METHOD:

Step 1. Find the smallest number (cost) of each row. Subtract this smallest number from every number in that row.

Step 2. Find the smallest number (cost) of each column. Subtract this smallest number from every number in that column.

Step 3. Now add 1 to all element and we get at least one ones in each row. Then make assignment in terms of ones. If there are some rows and columns without assignment. cam

2. NUMERICAL COMPARISON OF EXISTING METHODS WITH PROPOSED METHOD

1. Solve the following assignment problem using proposed method

Consider the problem of assigning five jobs to five persons. The assignment costs are given below

32	26	35	38
27	24	26	32
28	22	25	34
10	10	16	16

The minimum element of each row is subtracted from each element in that row.

6	0	9	12
3	0	2	8
6	0	3	12
0	0	6	6

Find the minimum element of each column and subtract it from each element in that row. The reduced matrix is as follows.

6	0	7	6
3	0	0	2
6	0	1	6
0	0	4	0

Now add 1 to all elements

7	1	8	7
4	1	1	3
7	1	2	7
1	1	5	1

The initial assignment is

7	[1]	8	7	√
~~4~~	~~1~~	~~[1]~~	~~3~~	
7	1	2	7	√
~~[1]~~	~~1~~	~~5~~	~~1~~	
√				

Subtract the smallest element from the uncovered numbers and then add 1 to the same numbers. Add the smallest number that lies at the intersection of two lines and leave the remaining elements of the matrix unchanged.

5	1	6	5
4	3	1	3
5	1	0	5
1	3	5	1

6	[1]	7	6	√
4	4	[1]	3	√
6	~~1~~	~~1~~	6	√
~~[1]~~	3	5	~~1~~	
	√	√		

3	1	7	3
1	4	1	0
3	1	1	3
1	6	8	1

4	[1]	7	4
2	4	~~1~~	[1]
4	~~1~~	[1]	4
[1]	6	8	~~1~~

Here the cost=26+32+25+10=93

2. Solve the following assignment problem using Hungarian method

32	26	35	38
27	24	26	32
28	22	25	34
10	10	16	16

Subtracting the smallest element of every row from all elements of that row and subtract the smallest element of every column from all elements of that column. Then make zero assignment

6	[0]	7	6
3	~~0~~	[0]	2
6	~~0~~	1	6
[0]	~~0~~	4	~~0~~

6	[0]	7	6	√
~~3~~	~~0~~	[0]	2	
6	~~0~~	1	6	√
~~[0]~~	~~0~~	4	~~0~~	

Subtract the smallest element from the uncovered numbers. Add the smallest number that lies at the intersection of two lines and leave the remaining elements of the matrix unchanged.

5	[0]	6	5
3	1	[0]	2
5	~~0~~	~~0~~	5
[0]	1	4	~~0~~

5	[0]	6	5	√
3	1	[0]	2	√
5	~~0~~	~~0~~	5	√
[0]	1	4	~~0~~	
	√	√		

3	[0]	6	3
1	1	~~0~~	[0]
3	~~0~~	[0]	3
[0]	3	6	~~0~~

Here the cost=26+32+25+10=93

3. CONCLUSION

In this paper, we presented a new method for solving Assignment problem. Initially, we explained the proposed algorithm and showed the efficiency of it by numerical example. And we get the optimal solution which is same as the optimal solution of Hungarian method. Therefore, this paper introduces a different approach which is easy to solve Assignment problem

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