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A Mind Boggling Problem for a Break in Adaptive Square Analysis for Scientists and Engineers II

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Abstract

In the first article we published recently, a problem in adaptive square was produced when the first author was in high school in Iran. He was introduced this problem by his teacher as a three by three matrices when if 1 to 9 are filled in this matrices, the addition of each row, vertical, horizontal or crossing becomes 15. In present work article we show how many ways we can arrange the numbers 1 to 25. In a 5x5 square to add the horizontal vertical and crossing to become 65.

KEYWORDS: ADAPTIVE SQUARE 3*3, ALGORITHM, 8 CACES IN ADAPTIVE SQUARE OF 3*3, adaptive square 5*5, 4 cases in adaptive square of 5*5

INTRODUCTION

In present work an algorithm is used to find in how many ways the 25 digits 1 to 25 are distributed in five by five square.

THEORY

We name the algorithm used in this work and previous work[1] algorithm T, in figures A to 3A this algorithm is used continuously until the end of each section we reach to the same matrix we were began. In each page, the matrix is started with a different ordered numbers. In fig 1A the initial matrix is

1	2	3	4	5
6	7	8	9	10
11	12	13	14	15
16	17	18	19	20
21	22	23	24	25

Fig.A

And it is transposed to

11	24	7	20	3
4	12	25	8	16
17	5	13	21	9
10	18	1	14	22
23	6	19	2	15

Fig.1A

This is correct square matrix where the summation of each row and column and crossing becomes 65 we denote the value of correct to this matrix is used in fig 1A with the applying of algorithm to the matrix of fig.2A is produced.

17	2	12	22	7
20	5	15	25	10
18	3	13	23	8
16	1	11	21	6
19	4	14	24	9

Fig.2A

This matrix does not have the characteristic of the summation of each row and column

and crossing is going to be 65. Therefore, it is not an adaptive square we follow this algorithm T again and again until we get the final matrix at the end of fig.1A. Which is the matrix that we started with.

1	2	3	4	5
6	7	8	9	10
11	12	13	14	15
16	17	18	19	20
21	22	23	24	25

Fig.A

This matrix in the beginning in fig.A and at the end are the same. By this algorithm T there are 2 out of 4 matrixes that have the characteristics of the adaptive square were in fig.B the initial matrix is shown in counter clockwise condition.

5	4	3	2	1
10	9	8	7	6
15	14	13	12	11
20	19	18	17	16
25	24	23	22	21

Fig.B

It is transposed to fig.1B

15	22	9	16	3
2	14	21	8	20
19	1	13	25	7
6	18	5	12	24
23	10	17	4	11

Fig.1B

this is correct square matrix where the summation of each row and column and crossing becomes 65. We denote the value of correct to this matrix is used in fig.1B

with the applying of algorithm to the matrix of fig.2B is produced.

19	4	14	24	9
16	1	11	21	6
18	3	13	23	8
20	5	15	25	10
17	2	12	22	7

Fig.2B

This matrix does not have the characteristic of the summation of each row and Column and crossing is going to be 65. Therefore it is not a adaptive square we follow this algorithm T again and again until we get the final matrix at the end of which is the matrix that we started with

5	4	3	2	1
10	9	8	7	6
15	14	13	12	11
20	19	18	17	16
25	24	23	22	21

Fig.B

This matrix in the beginning in fig.B and at the end are the same. By this algorithm T, there are 2 out of 4 matrix that have the characteristics of the adaptive square were.

CONCLUSION

It is shown by algorithm T we can produce 4 matrices witch have adaptive square characteristics where the summation of each row, column and crossing are equal to 65 when 1 to 25 are spread in a matrix of 5 by 5

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