

3010 Squares

Consider a 3 by 3 arrangement of the digits 1 to 9, as illustrated in the Figure 1 below.

The arrangement can be modified by rotating any of the 2-by-2 groups in the corners, either clockwise or anticlockwise. Thus if the top-right corner of the above arrangement is rotated anticlockwise, the result is the arrangement in the Figure 2.

A magic square is an n -by- n arrangement of numbers, such that the sum of the numbers in each row, column, and diagonal is the same. For example, the diagram in Figure 3 illustrates one possible 3-by-3 magic square for the numbers 1 to 9.

Figure 1

1	3	5
8	7	6
4	9	2

Figure 2

1	5	6
8	3	7
4	9	2

Figure 3

8	1	6
3	5	7
4	9	2

Your task is to determine the minimum number of moves to transform a given digit arrangement into a magic square.

For example, the magic square in Figure 3 can be obtained from the arrangement illustrated in Figure 2 by one clockwise rotation of the top-left corner. Thus the arrangement given in Figure 1 can be transformed into a magic square in 2 moves (and, as you can verify, no shorter sequences of moves would suffice).

Input

Input will consist of a series of lines, each specifying an initial arrangement of the digits 1 to 9, listed in row-by-row order.

The end of the input is indicated by a line that consists of the word 'END'.

Output

Output for each arrangement should consist of either:

- the minimum number of moves followed by a single space and then the word 'moves', or
- the word 'IMPOSSIBLE', if it is not possible to achieve a magic square arrangement.

Sample Input

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135876492
438975261
672159834
129764583
END
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Sample Output

2 moves

1 moves

0 moves

4 moves