Forming a Magic Square ★



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We define a magic square to be an $n \times n$ matrix of distinct positive integers from 1 to n^2 where the sum of any row, column, or diagonal of length n is always equal to the same number: the magic constant.

You will be given a $\mathbf{3} \times \mathbf{3}$ matrix \mathbf{s} of integers in the inclusive range $[\mathbf{1}, \mathbf{9}]$. We can convert any digit \mathbf{a} to any other digit \mathbf{b} in the range $[\mathbf{1}, \mathbf{9}]$ at cost of $|\mathbf{a} - \mathbf{b}|$. Given \mathbf{s} , convert it into a magic square at minimal cost. Print this cost on a new line.

Note: The resulting magic square must contain distinct integers in the inclusive range [1, 9].

Example

\$s = [[5, 3, 4], [1, 5, 8], [6, 4, 2]]

The matrix looks like this:

- 5 3 4
- 1 5 8
- 6 4 2

We can convert it to the following magic square:

- 8 3 4
- 1 5 9
- 6 7 2

This took three replacements at a cost of |5-8|+|8-9|+|4-7|=7.

Function Description

Complete the formingMagicSquare function in the editor below.

formingMagicSquare has the following parameter(s):

• int s[3][3]: a $\mathbf{3} \times \mathbf{3}$ array of integers

Returns

• int: the minimal total cost of converting the input square to a magic square

Input Format

Each of the $oldsymbol{3}$ lines contains three space-separated integers of row $oldsymbol{s[i]}$.

Constraints

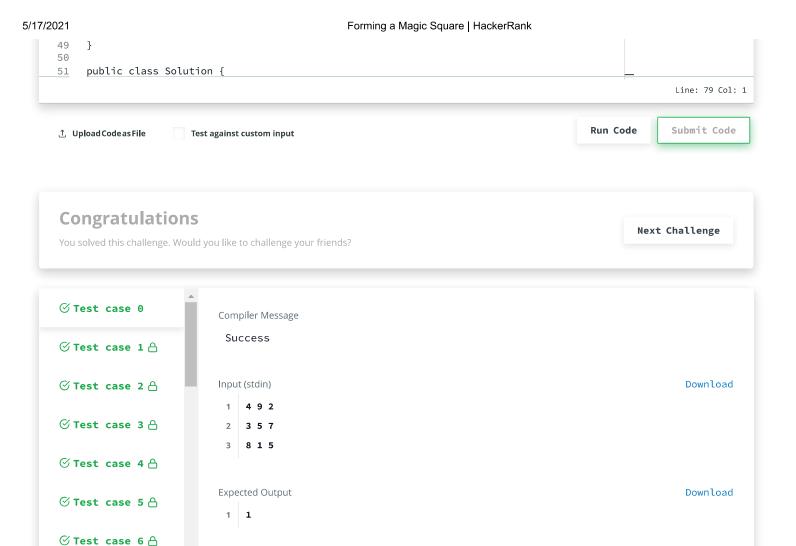
• $s[i][j] \in [1, 9]$

Sample Input 0

```
4 9 2
  3 5 7
  8 1 5
Sample Output 0
  1
Explanation 0
If we change the bottom right value, s[2][2], from b[3] to b[4] at a cost of b[6] at a cost of b[6] the common angle square at the minimum possible cost.
Sample Input 1
  4 8 2
  4 5 7
  6 1 6
Sample Output 1
Explanation 1
Using 0-based indexing, if we make
• s[0][1]-9 at a cost of |9-8|=1
• s[1][0]->3 at a cost of |3-4|=1
• s[2][0]->8 at a cost of |8-6|=2,
then the total cost will be 1+1+2=4.
```

```
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21
                                         public static int formingMagicSquare(List<List<Integer>> s) {
22
                                         // Write your code here
23
24
                                                             int a[][] = {
25
                                                                                {8,1,6,3,5,7,4,9,2},
26
                                                                                {6,1,8,7,5,3,2,9,4},
27
                                                                                {4,9,2,3,5,7,8,1,6},
28
                                                                                {2,9,4,7,5,3,6,1,8},
29
                                                                                \{8,3,4,1,5,9,6,7,2\},
30
                                                                                {4,3,8,9,5,1,2,7,6},
31
                                                                                \{6,7,2,1,5,9,8,3,4\},
                                                                                {2,7,6,9,5,1,4,3,8}
32
33
                                                            };
34
35
                                                             int ans = Integer.MAX_VALUE;
36
37
                                                             for(int i=0; i<8; i++){
38
                                                                                int temp = 0;
                                                                                for(int j=0; j<9; j++){
39
40
                                                                                                   temp += Math.abs(a[i][j] - s.get(j/3).get(j%3));
41
42
43
                                                                                ans = Math.min(temp, ans);
44
                                                            }
45
46
                                                             return ans;
47
48
```



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