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 3×3 matrix s of integers in the inclusive range $[1, 9]$. We can convert any digit a to any other digit b in the range $[1, 9]$ at cost of $|a - b|$. Given 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 3×3 array of integers

Returns

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

Input Format

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

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 5 to 6 at a cost of $|6-5|=1$, s becomes a magic square at the minimum possible cost.

Sample Input 1

```
4 8 2
4 5 7
6 1 6
```

Sample Output 1

```
4
```

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 $1+1+2=4$.

Change Theme Language Python 3

```python
#!/bin/python3

import math
import os
import random
import re
import sys

#
# Complete the 'formingMagicSquare' function below.
#
# The function is expected to return an INTEGER.
# The function accepts 2D_INTEGER_ARRAY s as parameter.
#

def formingMagicSquare(s):
    # Write your code here
    """
    Brute force
    :param s:
    :return:
    """
    # Write your code here
    # All possible 3x3 magic squares
    magic_squares = [
        [[8, 1, 6], [3, 5, 7], [4, 9, 2]],
        [[6, 1, 8], [7, 5, 3], [2, 9, 4]],
        [[4, 9, 2], [3, 5, 7], [8, 1, 6]],
        [[2, 9, 4], [7, 5, 3], [6, 1, 8]]
```

```
30          [[8, 3, 4], [1, 5, 9], [6, 7, 2]],
31          [[4, 3, 8], [9, 5, 1], [2, 7, 6]],
32          [[6, 7, 2], [1, 5, 9], [8, 3, 4]],
33          [[2, 7, 6], [9, 5, 1], [4, 3, 8]],
34      ]
```

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Next Challenge

- Test case 0
- Test case 1
- Test case 2
- Test case 3
- Test case 4
- Test case 5
- Test case 6

Compiler Message

```
Success
```

Input (stdin) Download

```
4 9 2
3 5 7
8 1 5
```

Expected Output Download

```
1
```