Forming a Magic Square

HackerRank

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 $[1, 9]$.

For example, we start with the following matrix s:

```
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 $|5 - 8| + |8 - 9| + |4 - 7| = 7$.

Input Format

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

Constraints

- $s[i][j] \in [1, 9]$

Output Format

Print an integer denoting the minimum cost of turning matrix s into a magic square.

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 $1+1+2=4$.