DS '19 Day 1 P1 - Arithmetic Square

Time limit: 2.5s **Memory limit:** 1G

You are given a 3×3 grid which contains integers.

Some of the 9 elements in the grid will have a value already, and the remaining elements will be unspecified. **Every element, including those which are unspecified, must be an integer from $-1\,000\,000$ to $1\,000\,000$, inclusive.**

Your task is to determine the number of ways to fill the grid so that each row, when read from left-to-right is an arithmetic sequence, and that each column, when read from the top-down, is an arithmetic sequence. There is guaranteed to be at least one way. As this number may be large, please output it modulo $10^9 + 7$.

Two ways of filling the grid are distinct if there is some cell which contains a different number in each way of filling the grid.

Recall that an arithmetic sequence of length three is a sequence of integers of the form

$$a, a + d, a + 2d$$

for integer values of a and d. Note that d may be any integer, including zero or a negative integer.

Input Specification

The input will be 3 lines long. Each line will have three space-separated values. Each given value will either be an integer in the range from $-1\,000$ to $1\,000$, inclusive, or the symbol `X`. However, the unspecified values may be integers in the range from $-1\,000\,000$ to $1\,000\,000$, inclusive.

For 10 of the 100 marks available, there will be 9 `X` symbols in the input.

For an additional 40 of the 100 marks available, there will be 8 `X` symbols in the input.

For an additional 40 of the 100 marks available, there will be 7 `X` symbols in the input.

For the final 10 of the 100 marks available, there will be 4 `X` symbols in the input.

Output Specification

Output a single integer, the number of valid ways to fill the grid taken modulo $10^9 + 7$.

Sample Input 1

```
8 9 10
16 X 20
24 X 30
```

Sample Output 1

```
1
```

Sample Input 2

```
X 0 X
0 0 0
X 0 X
```

Sample Output 2

```
2000001
```