

Task: MIS

Teddies

UFAM Workshop, contest #1. Source file `mis.*` Available memory: 128 MB.

Byteotian company 0101010 produces toys for children. 0101010 is well known, and their toys are considered top quality. To their horror, the employees have noticed that the four most recent models of teddies: A_1 , A_2 , B_1 and B_2 have a latent defect: should we take three teddies which all have the same letter in their model designations, or all have the same digit in their model designations, and line them up next to one another, the teddies will suffer an irreparable damage.

We shall say teddies are safely lined up, if none of them will suffer damage due to the latent defect, i.e. no three consecutive teddies have the same letter in their model designations, nor the same digit.

Byteasar has a collection of teddies, in which there are only the feral models – he has grown up to play with teddies only just, you see. To make things worse, Byteasar plays with his teddies by lining them up! Fortunately, despite his young age, he is well aware of the danger. Thus he wonders, how many safe line-ups of teddies are possible at all. And that's where the problems start – he is unable to determine it all by himself... Be a good mate and write a program to help him!

Input

In the first and only line of the input there are four non-negative integers: a_1 , a_2 , b_1 and b_2 separated by single spaces ($0 \leq a_1, a_2, b_1, b_2 \leq 38$). They denote the numbers of teddies, of models A_1 , A_2 , B_1 and B_2 , respectively. The total number of teddies will always be positive.

Output

In the first and only line of the output you should write the number of safe line-ups of teddies, modulo 1 000 000.

Example

For the input data:

0 1 2 1

the correct result is:

6

Explanation of the example: The 6 safe line-ups of teddies are: $B_1 A_2 B_1 B_2$, $B_1 A_2 B_2 B_1$, $B_2 A_2 B_1 B_1$, $B_2 B_1 A_2 B_1$, $B_1 B_2 A_2 B_1$ and $B_1 B_1 A_2 B_2$.