


# 0-1 Sequences

**Problem ID:** sequences**CPU Time limit:** 1 second**Memory limit:** 1024 MB**Difficulty:** 6.9**Author:** Tung Kam Chue**Source:** Hong Kong Regi  
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You are given a sequence, in the form of a string with characters '0', '1', and '?' only. Suppose there are  $k$  '?'s. Then there are  $2^k$  ways to replace each '?' by a '0' or a '1', giving  $2^k$  different 0-1 sequences (0-1 sequences are sequences with only zeroes and ones).

For each 0-1 sequence, define its number of inversions as the minimum number of adjacent swaps required to sort the sequence in non-decreasing order. In this problem, the sequence is sorted in non-decreasing order precisely when all the zeroes occur before all the ones. For example, the sequence 11010 has 5 inversions. We can sort it by the following moves: 11010  $\rightarrow$  11001  $\rightarrow$  10101  $\rightarrow$  01101  $\rightarrow$  01011  $\rightarrow$  00111.

Find the sum of the number of inversions of the  $2^k$  sequences, modulo 1 000 000 007 ( $10^9 + 7$ ).

## Input

The first and only line of input contains the input string, consisting of characters '0', '1', and '?' only, and the input string has between 1 to 500 000 characters, inclusive.

## Output

Output an integer indicating the aforementioned number of inversions modulo 1 000 000 007.

### Sample Input 1

### Sample Output 1