0-1 Sequences

Problem ID: sequences
CPU Time limit: 1 second
Memory limit: 1024 MB
Difficulty: 7.1

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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

```
?0?
```

Sample Output 1

```
3
```