Problem D: Delicious Binary Strings
Time Limit: 5 seconds

Description

Given a binary string $a_0a_1...a_{n-1}$, a *delicious* string $b_0b_1...b_{n-1}$ is defined to be another binary string with length **m** between 1 and **n**, such that for any number **p** with $0 \le \mathbf{p} \le \mathbf{n\text{-}m}$, the quantity below is even.

$$\sum_{k=0}^{m-1} a_{p+k} \wedge b_k$$

Herer ^ means **XOR**. For this problem, calculate the total number of different *delicious* strings modulo **1000000007**.

Input

A number of binary strings (≤**600**), **S**, where the length of **S** is between 1 and 50000.

Output

Output the answer for each input, one on each line.

Sample Input
10110
11100

Sample Output
24
23