

# G. Math, math everywhere

time limit per test: 5 seconds  
memory limit per test: 512 megabytes  
input: standard input  
output: standard output

*If you have gone that far, you'll probably skip unnecessary legends anyway...*

You are given a binary string and an integer  $m$ . Find the number of integers  $k$ ,  $0 \leq k < N$ , such that for all  $i = 0, 1, \dots, m - 1$

Print the answer modulo  $10^9 + 7$ .

## Input

In the first line of input there is a string  $s$  consisting of 0's and 1's ( $1 \leq |s| \leq 40$ ).

In the next line of input there is an integer  $n$  ( $1 \leq n \leq 5 \cdot 10^5$ ).

Each of the next  $n$  lines contains two space-separated integers  $p_i, a_i$  ( $1 \leq p_i, a_i \leq 10^9, p_i$  is prime). All  $p_i$  are distinct.

## Output

A single integer — the answer to the problem.

## Examples

input
1 2 2 1 3 1
output
2

input
01 2 3 2 5 1
output
15

input
1011 1 3 1000000000
output
411979884