F. Fibonacci String Subsequences

time limit per test: 3.5 seconds
memory limit per test: 256 megabytes
input: standard input
output: standard output

You are given a binary string s (each character of this string is either `0` or `1`).

Let's denote the cost of string t as the number of occurences of s in t. For example, if s is `11` and t is `111011`, then the cost of t is 3.

Let's also denote the Fibonacci strings sequence as follows:

- $F(0)$ is `0`;
- $F(1)$ is `1`;
- $F(i) = F(i - 1) + F(i - 2)$ if $i > 1$, where $+$ means the concatenation of two strings.

Your task is to calculate the sum of costs of all subsequences of the string $F(x)$. Since answer may be large, calculate it modulo $10^9 + 7$.

Input

The first line contains two integers n and x ($1 \le n \le 100$, $0 \le x \le 100$) — the length of s and the index of a Fibonacci string you are interested in, respectively.

The second line contains s — a string consisting of n characters. Each of these characters is either `0` or `1`.

Output

Print the only integer — the sum of costs of all subsequences of the string $F(x)$, taken modulo $10^9 + 7$.

Examples

input
2 4 11
output
14

input
10 100 1010101010
output
553403224