Problem D
Extensive Or
Problem ID: extensiveor

Consider a very large number R in a compressed format. It is compressed as a binary string s, and an integer k. Start with the empty string, and append s to it k times to get the binary representation of R. The string s is guaranteed to have a leading 1. Now, with R, solve the following problem: How many sets of n distinct integers are there such that each integer is between 0 and $R-1$, inclusive, and the XOR of all those integers is equal to zero? Since this number can get very large, return it modulo 10^9+7.

As a reminder, XOR is Exclusive Or. The XOR of two numbers is done bitwise. Using $\oplus$ for XOR:

$$0 \oplus 0 = 0$$
$$0 \oplus 1 = 1$$
$$1 \oplus 0 = 1$$
$$1 \oplus 1 = 0$$

XOR is associative, so $a \oplus (b \oplus c) = (a \oplus b) \oplus c$.

Input

Each input will consist of a single test case. Note that your program may be run multiple times on different inputs. Each input consists of exactly two lines. The first line has two space-separated integers n ($3 \leq n \leq 7$) and k ($1 \leq k \leq 100\,000$), where n is the number of distinct integers in the sets, and k is the number of times to repeat the string s in order to build R. The second line contains only the string s, which will consist of at least 1 and at most 50 characters, each of which is either `0` or `1`. s is guaranteed to begin with a `1`.

Output

Output a single line with a single integer, indicating the number of sets of n distinct integers that can be formed, where each integer is between 0 and $R-1$ inclusive, and the XOR of the n integers in each set is 0. Output this number modulo 10^9+7.

Sample Input 1	Sample Output 1
3 1 100	1

Sample Input 2	Sample Output 2
4 3 10	1978

Sample Input 3	Sample Output 3
5 100 1	598192244