Crazy Strings

You are given a string S of lower case Latin alphabets.
Let A be the set of all substrings of S.
We define F(x) as the number of ways in which you can choose exactly x equal strings from A. Now you are given N queries, each query consists of a number x, you need to output the value of F(x) modulo (10^9 + 7).

Constraints:

1 <= |S| <= 5000
1 <= N <= 10^5
1 <= x <= 10^9
Time = 4 sec

Input:

First line contains |S| and N. (length of the string and number of queries)
Next line contains the string S.
Next N lines follow each containing number “x” for each query.

Output:

For each query output F(x)%(10^9+7) in a separate line.

Sample Input:

5 4
ababa
2
1
3
4

Sample Output:

7
15
1
0

Explanation:

A = {**"a", "b", "a", "b", "a", "ab", "ba", "ab", "ba", "aba", "bab", "aba", "abab", "baba", "ababa"**}

F(2) = There are seven ways to choose two equal strings ("a", "a"), ("a", "a"), ("a", "a"), ("b", "b"), ("ab", "ab"), ("ba", "ba"), ("aba", "aba").