

Problem name: BOI-handsome

Language: English

**Source code:** handsome.c, handsome.cpp, handsome.pas  
**Input / Output files:** handsome.in / handsome.out  
**Time limit:** 0.8 s  
**Memory limit:** 256 MB

### Task description

Little Đurica is a member of Secret Poets society, which is well-known for its number-related beliefs. "Dangerous numbers" belief is considered to be the most important one. A number is "dangerous" if any ordered pair of its consecutive digits is a member of a special set  $F$ .

Little Đurica is so excited about numbers that he decided to introduce his own numbers, so-called *BOI-handsome* numbers. For a number  $x$  we say it is a BOI-handsome number if the following holds:

- $x$  consists only of digits 1, 2, and 3
- $x$  contains  $n$  digits exactly
- $x$  is not a dangerous number

However, the ordering of BOI-handsome numbers is not the standard one. Instead of first comparing digits at position 1 (from left side), then at position 2 and so on, the numbers are compared according to some permutation  $P$  of  $\{1, 2, \dots, n\}$ . Given  $P$ , we first compare digits at position  $P(1)$ , then  $P(2)$  and so on until  $P(n)$ . Let us call this  $P$ -ordering.

Little Đurica picks a BOI-handsome number  $B$ . Compute how many BOI-handsome numbers are smaller or equal than  $B$  in  $P$ -ordering. Since little Đurica does not like huge numbers, return the count by modulo 1000000007 ( $10^9 + 7$ ).

### Input

The first line of the input contains a single integer  $n$  denoting the number of digits in BOI-handsome numbers. The next line contains  $n$  space-separated integers representing a permutation  $P$ . The  $i$ -th integer of the line represents  $P(i)$ .

The next line contains a single integer  $m$  denoting the number of elements in the special set  $F$ . The next line contains  $m$  space-separated distinct members of  $F$ .

The fifth (last) line contains a single integer representing the number  $B$ .

### Output

On the first and the only line of the output, print the number of BOI-handsome numbers smaller than or equal to  $B$  with respect to  $P$ -ordering. The count should be output by modulo 1000000007.

### Example

Input:	Output:
3 2 1 3 2 22 13 321	9

### Example explanation

The numbers between 111 and  $B$ , in strictly increasing order with respect to  $P$ -ordering, consisting only of digits 1, 2, and 3, are:

111, 112, 113, 211, 212, 213, 311, 312, 313, 121, 122, 123, 221, 222, 223, 321.

Numbers 113, 213, 313, 122, 221, 222, and 223 are dangerous, since all of them contain 22 or 13. The remaining numbers are BOI-handsome.

### Constraints

- $1 < n \leq 400\,000$
- $1 \leq m$
- Each member of  $F$  is of the form  $ab$  where  $a, b$  are from  $\{1, 2, 3\}$
- $B$  is a BOI-handsome number.
- In 20% of test cases, it will hold  $n \leq 1\,000$ .
- In 50% of test cases the input permutations will be the identity permutation, i.e.  $P(i) = i$  for each  $1 \leq i \leq n$ .
- In 20% of test cases the input permutations will be drawn uniformly at random.