

Emma and sum of products



Emma is really fond of integers and loves playing with them. Her friends were jealous, and to test her, one of them gave her a problem.

Emma is given a list A of N integers and is asked a set of Q queries. Each query is denoted by an integer K , for which you have to return the sum of product of all possible sublists having exactly K elements. Emma has got stuck in this problem and you being her best friend have decided to help her write a code to solve it. Since the answers can be very large, print the answers modulo **100003**.

Input Format

First line has an integer N , denoting the number of integers in list A . Next line contains N space separated integers. The third line contains integer Q , and next Q lines have a single integer K .

Output Format

For each of the queries, print the corresponding answer in a new line.

NOTE Sublist here refers to selecting K elements from a list of N elements. There will be $\binom{N}{K}$ ways to do that, it doesn't matter if two elements are same.

Constraints

$$1 \leq N \leq 3 \times 10^4$$

$$1 \leq A_i \leq 10^5$$

$$1 \leq Q \leq N$$

$$1 \leq K \leq N$$

Sample Input #00

```
3
1 2 3
2
1
2
```

Sample Output #00

```
6
11
```

Sample Input #01

```
3
1 2 2
1
2
```

Sample Output #01

```
8
```

Explanation

Sample #00:

For $K = 1$ possible sublists are $\{1\}, \{2\}, \{3\}$ so answer is $1 + 2 + 3 = 6$.

For $K = 2$ possible sublists are $\{1, 2\}, \{2, 3\}, \{3, 1\}$ so answer is

$$(1 \times 2) + (2 \times 3) + (3 \times 1) = 2 + 6 + 3 = 11.$$

Sample #01:

For $K = 2$ possible sublists are $\{1, 2\}, \{2, 2\}, \{2, 1\}$ so answer is $(1 \times 2) + (2 \times 2) + (2 \times 1) = 2 + 4 + 2 = 8$.