Your team boards a small cart which rolls into a chamber under the arena's bleachers. Inside the room is a tall door with an electronic lock. On its display is a series of random letters and a set of instructions:

problem **13**
Five Letter Words
8 points

> *Take these letters and combine them into all possible 5-letter "words". Alphabetize them and remove all duplicates. Number your final list starting with 1. Then type in the words corresponding to the numbers shown on the screen. If all of your entries are correct, the door will open for you to receive your reward.*

Write a program to find the correct 5-letter entries for the letters and list-locations provided.

Input

The input starts with an integer N (from 1 to 10). The next line holds N capital letters separated by spaces. They may not be unique, nor in alphabetical order. The following lines each have one integer K. The input ends with a zero (0).

```
8
B R E D E A E A
1
3
316
321
0
```

Output

Arrange the letters into all possible 5-letter combinations ("words"). You may use each letter only as often as it appears in the input. Arrange these words in alphabetical order, eliminating duplicate words. For each integer K, print the value of K, followed by a colon and the K'th word in the alphabetical list (the first word is number 1.) If K is larger than the number of list entries, print the list length and last entry in the list.

```
1: AABDE
3: AABED
316: BREAD
321: BREED
```

Example Input 2
```
10
B A A A A B B B B A
1
16
40
0
```

Example Output 2
```
1: AAAAA
16: ABBBB
32: BBBBB
```

It may be helpful during development to print your list to make sure you've eliminated all duplicates and your list is ordered correctly.