Tribe

English Vietnamese

The language of an ancient tribe was only based on two characters - *a* and *b* - to create words. It also used character space to separate words in the sentence. So, a word was an unextendible consecutive characters in a sentence. A sentence did not contain meaningless words. People in the tribe were very religious, they believed that each word had its own lucky value. The value of a sentence is the summation of the value of each word in that sentence.

You can use at most **x** character *a*, **y** character *b* and **z** character space to make the a sentence. Show us how lucky you are! Tell us the luckiest sentence you can make. In case of multiple solutions, print the smallest lexicographical sentence (space is smaller than *a* and *a* is smaller than *b*).

Input

- The first line contains N, the number of meaningful words in the language.($1 \leq N \leq 50$)
- The second line contains 3 integer numbers:**x**, **y**, **z** as stated.($0 \leq x, y, z \leq 50$)
- Each of the next N lines contains one word and its value, separated by a space. Value of a word is a positive integer and not exceed 50.

Output

Only one line, contains the sentence you found.

Example

Input:
4
3 3 1
abb 3
baa 3
aaa 4
bbb 1

Output:
abb baa

Note

- The sentence s1 is lexicographically smaller than sentence s2 if the string represents s1 is smaller than s2.