

A permutation of a string is the set of all possible ways to combine its characters. E.g., the permutation of “abc” is {“abc”, “acb”, “bac”, “bca”, “cab”, “cba”}. The size of this set is the factorial of the initial string size.

Given a string S (with up to 20 characters, all lowercase letters) and a integer N ($0 \leq N < 20!$) find the $(N + 1)$ -th smallest element of the permutation of S (consider the lexicographic order; the permutation of ‘abc’ above, for example, is represented in lexicographic order form left to right).

E.g., if $S = \text{“abc”}$ and $N = 0$, then the result would be “abc”

E.g., if $S = \text{“abc”}$ and $N = 5$, then the result would be “cba”

E.g., if $S = \text{“abc”}$ and $N = 3$, then the result would be “bca”

E.g., if $S = \text{“cba”}$ and $N = 3$, then the result would be “bca”

Notice that the string may not be initially sorted (check the last two examples).

Input

The input file contains one line with the number of samples and then each sample consists of two lines: one with string S and the next with number N .

Output

For each sample, a line with the required value.

Sample Input

```
2
abc
3
abcde
119
```

Sample Output

```
bca
edcba
```