

940 Autobiographical Numbers

In the decimal system an *autobiographical number* is a natural number with no more than 10 digits,

$$N = d_0d_1 \dots d_{r-1} \quad (1 \leq r \leq 10)$$

such that d_0 is the number of 0's in N , d_1 is the number of 1's in N , d_2 is the number of 2's in N , and so on.

The notion of autobiographical number can be generalized to any base $b \geq 2$.

Let $A = [s_0, s_1, \dots, s_{b-1}]$ be an *alphabet*, whose symbols s_0, s_1, \dots, s_{b-1} correspond to the values $0, 1, \dots, b-1$, respectively: that is, $\text{value}(s_i) = i$. Then, an *autobiographical number in base b (under the alphabet A)* is a natural number with no more than b symbols,

$$N = d_0d_1 \dots d_{r-1} \quad (1 \leq r \leq b)$$

such that $\text{value}(d_0)$ is the number of s_0 's in N , $\text{value}(d_1)$ is the number of s_1 's in N , ..., and $\text{value}(d_{r-1})$ is the number of s_{r-1} 's in N .

For example:

- 42101000 is an autobiographical number in base 10, under the alphabet $[0, 1, 2, 3, 4, 5, 6, 7, 8, 9]$, because it has four 0's, two 1's, one 2, zero 3's, one 4, zero 5's, zero 6's, and zero 7's;
- A2100000001000 is an autobiographical number in base 16, under the alphabet $[0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, F]$. There are $\text{value}(A)=10$ 0's, two 1's, etc.

Given an alphabet A , with b symbols, determine all autobiographical numbers in base b under A .

Input

The first line contains a positive integer L ($1 \leq L \leq 50$), which is the number of subsequent lines.

Each of the following L lines contains an alphabet.

An alphabet is a contiguous sequence of b distinct symbols, where $2 \leq b \leq 100$.

A symbol is a printable character.

Output

For each input alphabet, the output is the sequence of all autobiographical numbers in increasing order. Each number is written on a different line.

The outputs of two consecutive alphabets are separated by a blank line.

Sample Input

```
2
0123
abcdefg
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Sample Output

1210
2020

bcba
caca
cbcaa
dcbbaaa