



Security issue

- Time limit: 1 second
- Memory limit: 256 MB

Charzeh and Pashmak recently packed their bags and decided to travel around the world in 79 days. But they face some problems during their world tour and they want you to solve them for them.



When they arrived in America, CIA agents arrested them on charges of espionage and took them to distant prisons. On one of the days (or maybe nights...) when they were rotting in their clothes, an important news came to them, and that was that the CIA wanted political and security prisoners to implement the PES (!!) encryption program. frees Pashmak and Cherze, who usually do not like to rot and die, tried to implement this encryption, but since they know nothing about encryption, their eyes turned to you again.

This type of encryption runs on a string of uppercase and lowercase English letters and creates a new string like this:

If the primary string S So, we start from the first letter of the string from the left side and move forward and for every S_i of string, instead, y We add the English letter A_{min} so that

$$y = (X_i * A_i + 1) \bmod 26$$

here A_i The letter number in the alphabet and X_i The number of letter repetitions S_i In the whole field S is. Here you should pay attention to several points:

- i. In the event that S_i If the letter is an uppercase letter of the English alphabet, its replacement letter must also be an uppercase letter of the alphabet, and otherwise the replacement letter must be a lowercase letter of the English alphabet.
- ii. in counting X_i The capitalization and smallness of the letters has no effect.
- iii. Counting letters starts from 0 and as a result the number of letters a And A , 0 and the number of letters Z And Z It is May 25.
- iv. $a \bmod b$ It means the remainder a On b .

Input

In one line, you will be given a string consisting of uppercase and lowercase letters of the English alphabet.



Questions

100	Level of addiction
100	Difficult cooperation
125	gathering of elders
150	Security issue
250	Great typist
500	Text machine

All submissions

Final submissions

Scoreboard

$$1 \leq |S| \leq 300$$

Output

Print the encrypted string in the first and last line of the output.

Example

Sample input 1

CharzE

Sample output 1

DibsaF

Sample input 2

Abbaabss

Sample output 2

Beebbell

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