The chemical formula of a molecule $M$ describes its atomic make-up. Chemical formulas obey the following grammar:

\[
M := G \mid MG \\
G := S \mid SC \\
S := A \mid (\text{' } M \text{' })' \\
C := T \mid NE \\
E := D \mid DE \\
T := '2' \mid \ldots \mid '9' \\
N := '1' \mid \ldots \mid '9' \\
D := '0' \mid \ldots \mid '9' \\
A := U \mid UL \mid ULU \\
U := 'A' \mid \ldots \mid 'Z' \\
L := 'a' \mid \ldots \mid 'z'
\]

The $C$ represents a multiplier for the subgroup $S$ that precedes it. For example, $\text{H}_2\text{O}$ has two $\text{H}$ (hydrogen) and one $\text{O}$ (oxygen) atoms, and $(\text{AlC}_2)_3\text{Na}_4$ contains 3 $\text{Al}$ (aluminum), 6 $\text{C}$ (carbon) and 4 $\text{Na}$ (sodium) atoms.

**Input**

The input will contain data for one or more test cases. For each test case, there will be one line of input, containing a valid chemical formula. Each line will have no more than 100 characters.

**Output**

For each line of input there will be one line of output which is the atomic decomposition of the chemical in the form of a sum as shown in the sample output. The atoms are listed in lexicographical order, and a count of 1 is implied and not explicitly written. There are no blank spaces in the output. All of the counts in the correct output will be representable in 32-bit signed integers.

**Sample Input**

\[
\text{H}_2\text{O} \\
(\text{AlC}_2)_3\text{Na}_4
\]

**Sample Output**

\[
2\text{H}+0 \\
3\text{Al}+6\text{C}+4\text{Na}
\]