

## 6085 Chemistry

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

```
M := G | M G
G := S | S C
S := A | '(' M ')
C := T | N E
E := D | D E
T := '2' | ... | '9'
N := '1' | ... | '9'
D := '0' | .. | '9'
A := U | U L | U L L
U := 'A' | .. | 'Z'
L := 'a' | .. | 'z'
```

The  $C$  represents a multiplier for the subgroup  $S$  that precedes it. For example,  $H_2O$  has two H (hydrogen) and one O (oxygen) atoms, and  $(AlC_2)_3Na_4$  contains 3 Al (aluminum), 6 C (carbon) and 4 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

```
H2O
(AlC2)3Na4
```

### Sample Output

```
2H+O
3Al+6C+4Na
```