N^a (log N)^b

Input file:	`standard input`
Output file:	`standard output`
Time limit:	2 seconds
Memory limit:	1024 megabytes

You are given a function $F(N)$ for a positive integer N, represented as a string F following the BNF notation for the ⟨expr⟩ symbol as follows:

⟨expr⟩ ::= ⟨term⟩ | ⟨expr⟩ '`+`' ⟨term⟩
⟨term⟩ ::= ⟨factor⟩ | ⟨term⟩ '`*`' ⟨factor⟩
⟨factor⟩ ::= '`N`' | '`N^`' ⟨number⟩ | '`log(`' ⟨expr⟩ '`)`' | '`log(`' ⟨expr⟩ '`)^`' ⟨number⟩ | '`(`' ⟨expr⟩ '`)`'
⟨number⟩ ::= ⟨nonzero_digit⟩ | ⟨nonzero_digit⟩⟨digit_string⟩
⟨digit_string⟩ ::= ⟨digit⟩ | ⟨digit⟩⟨digit_string⟩
⟨nonzero_digit⟩ ::= '`1`' | '`2`' | '`3`' | '`4`' | '`5`' | '`6`' | '`7`' | '`8`' | '`9`'
⟨digit⟩ ::= '`0`' | ⟨nonzero_digit⟩

The symbols represent the following:

- `N`: N
- `+`: Addition $+$
- `*`: Multiplication $\times$
- `log`: Natural logarithm log
- `(`, `)`: Parentheses, with higher precedence than addition `+` or multiplication `*`
- `^`: Exponentiation, with higher precedence than addition `+` or multiplication `*`

⟨number⟩ represents an integer in decimal notation, guaranteed to be between 1 and 10^9. Also, '`log(`' ⟨expr⟩ '`)^`' ⟨number⟩ represents $(\log(\langle\text{expr}\rangle))^{\langle\text{number}\rangle}$.

For example, the following strings can be ⟨expr⟩ symbols:

- `N+log(N)*N`: Represents $N + \log(N) \times N$.
- `N^1+N^2+log(N)+log(N)^1000000000`: Represents $N^1 + N^2 + \log(N) + (\log(N))^{1000000000}$.
- `N*(N+(log(N+N)^2*N))+(((N)))`: Represents $N \times (N + (\log(N + N))^2 \times N) + (((N)))$.
- `(log((N)))`: Represents $(\log((N)))$.

The following strings cannot be ⟨expr⟩ symbols:

- `(log(N)+N)^2`: The form '`(`' ⟨expr⟩ '`)^`' ⟨number⟩ is not used in ⟨factor⟩.
- `(log(N))^2`
- `(N`
- `)N(`

- `N^1000000001`
- `N^02`
- `N^0`
- `N^N`
- `2`
- `log(3)`
- `N-log(N)`
- `log(N)/N`

While $F(N)$ may not be defined for all positive integers N, for any input, there exists a positive integer N_0 such that $F(N)$ is defined for all positive integers $N \geq N_0$.

Therefore, define the set S of all non-negative integer pairs (a, b) such that the limit

$$\lim_{N \to \infty} \frac{F(N)}{N^a (\log N)^b}$$

converges to a finite value (including 0). Output the **lexicographically smallest pair** (a, b) in S.

Here, a non-negative integer pair (a, b) is the lexicographically smallest in S if it belongs to S, and for any other pair (a', b') in S, either:

- $a < a'$
- $a = a'$ and $b \leq b'$

It is proven that S is not an empty set, and furthermore, there exists the lexicographically smallest pair in S.

Input

The input is given from Standard Input in the following format:

```
F
```

- The function $F(N)$ is given as a string F following the $\langle \text{expr} \rangle$ symbol defined in the problem statement.
- $1 \leq |F| \leq 10^5$

Output

Output the lexicographically smallest pair (a, b) of S separated by a space.

Examples

standard input	standard output
`N*log(N^2)*log(N)+N+log(N^1+N)^2*N`	`1 2`
`N*log(log(N))`	`1 1`
`(((N))*N^234567890+N^2)`	`234567891 0`

Note

In the first example, $F(N) = N \times \log(N^2) \times \log(N) + N + (\log(N^1 + N))^2 \times N$.

For this case, non-negative integer pairs (a, b) such that the limit in the problem statement converges to a finite value include $(a, b) = (1, 2), (1, 3), (2, 0)$, etc. For these pairs, the limits are as follows:

$$\lim_{N\to\infty} \frac{F(N)}{N^1(\log N)^2} = 3$$

$$\lim_{N\to\infty} \frac{F(N)}{N^1(\log N)^3} = 0$$

$$\lim_{N\to\infty} \frac{F(N)}{N^2(\log N)^0} = 0$$

Note that 0 is considered a finite value. On the other hand, for example, $(a, b) = (1, 1)$ leads to:

$$\lim_{N\to\infty} \frac{F(N)}{N^1(\log N)^1} = \infty$$

and does not converge to a finite value.

It can be shown that within the set S of all pairs satisfying the conditions, $(a, b) = (1, 2)$ is lexicographically the smallest.

In the second example, $F(N) = N \times \log(\log(N))$. For $(a, b) = (1, 1)$:

$$\lim_{N\to\infty} \frac{F(N)}{N^1(\log N)^1} = 0$$

and converges to a finite value.

It can be shown that within the set S of all pairs satisfying the conditions, $(a, b) = (1, 1)$ is lexicographically the smallest.

In the third example, $F(N) = \big(((N)) \times N^{234567890} + N^2\big)$.