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Big Integer Factorization

It is a well-known fact that every natural number has a unique prime factorization. That is, you can uniquely express each natural number **N** as:

$$N = P_1^{M_1} \times P_2^{M_2} \times ... \times P_K^{M_K}$$

Where $P_1 < P_2 < \ldots < P_K$ are prime numbers. For example, $28 = 2^2 \times 7$ and $3645 = 3^6 \times 5$.

In general, finding the prime factorization of large numbers is difficult to do (and serves as a basis for many cryptographic systems). However, in some special cases it is easy to find a number's prime factorization.

One such case is when a number is a power of a smaller number. Given a number **N**, can you figure out the prime factorization of $\mathbf{N^N}$?

Input
Each test case contains one integer **N** ($2 \leq \mathbf{N} \leq 2^{57}$).

Output
For each test case, output, on one line, prime factorization of the number.

Sample Input 1:
```
6
```

Sample Output 1:
```
2^6 * 3^6
```

Sample Input 2:
```
197538393501504
```

Sample Output 2 (Wrapped to two lines - actual output is one line):
```
2^1185230361009024 * 3^790153574006016 * 11^592615180504512 *
31^987691967507520
```