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:



Where P1 < P2 < … < PK are prime numbers. For example, 28 = 22x7 and 3645 = 36x5.

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 **NN**?

**Input**

Each test case contains one integer **N** (2 ≤ **N** ≤ 257).

**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