Prime Time

For your math homework this week your teacher gave you five large numbers and asked you to find their prime factors. However these numbers aren't *nearly* large enough for someone with knowledge of programming like yourself. So you decide to take the factorial of each of these numbers. Recall that N! (N factorial) is the product of the integers from 1 through N (inclusive). It's your job now to create a program to help you do your homework.

Input

Each test case contains a number N ($2 \leq N \leq 10000$).

Output

The output should contain a line representing the prime factorization of the factorial given number, which should be of the form: $p_1\text{^}e_1 * p_2\text{^}e_2 * ... * p_k\text{^}e_k$ where p_1, p_2, ..., p_k are the distinct prime factors of the factorial of the given number in increasing order, and e_1, e_2, ..., e_k are their exponents.

Example

Input:
10

Output:
2^8 * 3^4 * 5^2 * 7^1