

Naïve Factorization

In this problem, we are interested in what the factorization of an integer N is. For example, $200 = 2^3 \times 5^2$ or $3298402 = 2 \times 29^2 \times 37 \times 53$. Write the function `factor(N)` that returns a list `[[p1, n1], [p2, n2], ..., [pk, nk]]` where $N = \prod_{i=1}^k p_i^{n_i}$. For example:

- `factor(200)` returns `[[2,3], [5,2]]`
- `factor(3298402)` returns `[[2,1], [29,2], [37,1], [53,1]]`

```
def factor(N): #N is a positive integer greater than 1

exec(input().strip()) #This line is required for grader to work.
```

A simple method of finding all factors of an integer N can be done by brute forcing dividing numbers from $k = 2, 3, \dots$, and so on. Whenever a value of N is divisible by k with no remainders, continuously divide N with k until it cannot be divided anymore (while recording how many times this division is done). Then, try the next k value. Doing this will increase k and decrease N . Whenever k is greater than N , this means all the factors have been found.

Example: Let $N = 200$. Start at $k = 2$. 200 is divisible by 2. N can be divided 4 times until it can no longer be divided. N changes to $200 \rightarrow 100 \rightarrow 50 \rightarrow 25$ (Add `[2,3]` to the answer). Then, change to $k=3$. 25 isn't divisible by 3, so this is skipped. 4 is also skipped. When $k=5$, it is divisible twice, changing N to $25 \rightarrow 5 \rightarrow 1$. (Add `[5,2]` to the answer). Now, $k=6$ and $N=1$. All factors are now found, the answer is `[[2,3],[5,2]]`, which represents $200 = 2^3 \times 5^2$.

Input

A Python command for testing the function.

Output

The result from doing the command.

Example

Input (from keyboard)	Output (on screen)
<code>print(factor(200))</code>	<code>[[2, 3], [5, 2]]</code>
<code>print(factor(3298402))</code>	<code>[[2, 1], [29, 2], [37, 1], [53, 1]]</code>
<code>print(factor(8137740897))</code>	<code>[[3, 4], [11, 2], [13, 2], [17, 3]]</code>