

Task: NWW

Least common multiple



XXVII OI, Stage I. Source file `nww.*` Available memory: 128 MB.

21.10 – 18.11.2019

Byteasar is studying for a maths test which will focus on determining the least common multiple. Recall that the least common multiple (lcm) of integers a_1, a_2, \dots, a_k is the least positive integer d such that each of a_1, a_2, \dots, a_k is its divisor. For example, $\text{lcm}(8, 12) = 24$, whereas $\text{lcm}(2, 3, 4) = 12$.

Byteasar quickly mastered the standard exercises, and found the subject so amusing that he started inventing tasks of his own. Let us find out if you are able to solve one of those.

For a given positive integer M you are to return an interval of positive integers $[a, b]$ such that the least common multiple of all the integers in it is exactly M . The interval $[a, b]$ has to contain at least two positive integers.

To thoroughly test your skills, Byteasar will ask you (or rather your program) multiple queries.

Input

In the first input line there is a single integer z ($z \geq 1$) which specifies the number of Byteasar's queries. The next z lines specify the queries, one per line. Each query is specified by a single integer M ($M \geq 1$).

Output

Your program should print exactly z lines to the standard output. The i -th of these should contain the answer to the i -th Byteasar's query. An answer to a query consists of two positive integers a and b , separated by a single space, which stand for the interval of integers $[a, b]$.

If no interval satisfies the desired property, the single word NIE (Polish for *no*) should be printed instead of any numbers.

If there is more than one answer, report the one with minimum a , breaking ties (if any) in favor of smaller b .

Example

For the input data:

3
12
504
17

the correct result is:

1 4
6 9
NIE

Explanation for the example: For the first query, the number 12 is the least common multiple for the interval $[2, 4]$, which contains 2, 3 and 4, but also for the interval $[1, 4]$, which contains 1, 2, 3 and 4. The second interval has smaller a .

Sample grading tests:

1ocen: five M values: 5, 6, 7, 8, and 9,

2ocen: single M value: 1 000 000,

3ocen: single M value: 99 999 990 000 000,

4ocen: $z = 10\,000$, the values of M alternate between 500 001 500 001 000 001 and 500 001 500 001 000 000.

Grading

The set of tests consists of the following subsets. Within each subset, there may be several tests.

Subset	Condition	Score
1	$z \leq 10, M \leq 1000$	18
2	$z \leq 100, M \leq 10^9$	20
3	$z \leq 100, M \leq 10^{18}$	20
4	$z \leq 10\,000, M \leq 10^{18}$	42