

H - Multifactorials

Time Limit: 1 sec

Memory Limit: 16MB

A generalization of the factorials gives us multifactorials:

$$n! = n \cdot (n-1) \cdot (n-2) \cdot (n-3) \dots$$
$$n!! = n \cdot (n-2) \cdot (n-4) \cdot (n-6) \dots$$
$$n!!! = n \cdot (n-3) \cdot (n-6) \cdot (n-9) \dots$$

In general (there are k marks '!'):

$$n!!! \dots! = n \cdot (n-k) \cdot (n-2k) \dots (n \bmod k), \text{ if } k \text{ doesn't divide } n,$$
$$n!!! \dots! = n \cdot (n-k) \cdot (n-2k) \dots k, \text{ if } k \text{ divides } n$$

In this problem you are given a multifactorial, and you have to find the number of different dividers it has.

INPUT:

The first line contains integer N ($0 < N \leq 500$), it is number of tests. Each of the next N lines contains a multifactorial. Integer part of multifactorial is less or equal to 1000 and there are no more than 20 characters '!'.

OUTPUT:

For each test case print line formatted like this: „Case i : a “. Where „ i “ is a test number, and „ a “ is the number of dividers in multifactorial. If number of dividers exceed 10^{18} print „Infinity“ (see examples).

SAMPLE INPUT:

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3
5!
13!!
230!
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SAMPLE OUTPUT:

```
Case 1: 16
Case 2: 64
Case 3: Infinity
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Problem setters: Aleksej Viktorchik, Leonid Shishlo.
Huge Easy Contest #1