11347   Multifactorials

A generalization of the factorials gives us multifactorials:

$n! = n * (n - 1) * (n - 2) * (n - 3) \ldots$
$n!! = n * (n - 2) * (n - 4) * (n - 6) \ldots$
$n!!! = n * (n - 3) * (n - 6) * (n - 9) \ldots$

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

$n!!\ldots! = n * (n - k) * (n - 2k) \ldots (n \bmod k)$, if k doesn't divide n,
$n!!\ldots! = n * (n - k) * (n - 2k) \ldots k$, if k divides n

It 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 ($0 < N \le 500$), 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 then 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

```
3
5!
13!!
230!
```

Sample Output

```
Case 1: 16
Case 2: 64
Case 3: Infinity
```