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 ($0 < N \leq 500$), 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 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
```