The complex numbers $a+bi$, where $i=\sqrt{-1}$ and a and b are integers, are called the Gaussian integers. The *norm* of a complex number is given by $\sqrt{a^2+b^2}$. Every Gaussian integer can be factorized as a product of Gaussian primes. You task is to determine if a given Gaussian integer is a prime, i.e., if it can not be written as the product of two other Gaussian integers, x and y, where both x and y have norms larger than 1 (This is the same as requiring both x and y to be different from 1, -1, i and $-i$). For example, $2=(1+i)(1-i)$, and, therefore, 2 is not a prime. 11 is a Gaussian prime, but $13=(3+2i)(3-2i)$ is not a prime. In the same way, $3+i=(1+i)(2-i)$ is not a prime.

Input

You are given a list of n Gaussian integers. The first number, n, in a row by itself, is the number of Gaussian integers that follow. This number is followed by n pairs of (possibly negative) integers, one per row, representing, respectively, the real and imaginary part of each Gaussian integer. The absolute value of the real and imaginary parts of every input number will be no larger than 10000, and the list will not have more than 100 numbers. Additionally, every pair (a,b) satisfies $a^2+b^2 \geq 2$.

Output

For each Gaussian prime in the input, you should write the letter '`P`', for *Prime*. For each non-prime, you should write the letter '`C`', for *Composite*.

Sample Input

```
6
2 0
3 0
5 0
13 0
3 1
10 1
```

Sample Output

```
C
P
C
C
C
P
```