ZOJ Problem Set - 3609

Modular Inverse

Time Limit: 2 Seconds Memory Limit: 65536 KB

The modular modular multiplicative inverse of an integer *a* modulo *m* is an integer *x* such that $a^{-1} \equiv x \pmod{m}$. This is equivalent to $ax \equiv 1 \pmod{m}$.

Input

There are multiple test cases. The first line of input is an integer $T \approx 2000$ indicating the number of test cases.

Each test case contains two integers $0 < a \leq 1000$ and $0 < m \leq 1000$.

Output

For each test case, output the smallest positive *x*. If such *x* doesn't exist, output "Not Exist".

Sample Input

```
3
3 11
4 12
5 13
```

Sample Output

```
4
Not Exist
8
```

References

- http://en.wikipedia.org/wiki/Modular_inverse

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Contest: **The 9th Zhejiang Provincial Collegiate Programming Contest**

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