

Binomial Coefficients

In mathematics, **binomial coefficients** are a family of positive integers that occur as coefficients in the binomial theorem.

$$\binom{n}{k}$$

denotes the number of ways of choosing k objects from n different objects.

However when n and k are too large, we often save them after modulo operation by a prime number P. Please calculate how many binomial coefficients of n become to 0 after modulo by P.

Input Format

The first of input is an integer *T*, the number of test cases.
Each of the following *T* lines contains 2 integers, *n* and prime *P*.

Constraints

- T* < 100
- n* < 10⁵⁰⁰
- P* < 10⁹

Output Format

For each test case, output a line contains the number of $\binom{n}{k}$ s (0<=k<=n) each of which after modulo operation by P is 0.

Sample Input

```
3
2 2
3 2
4 3
```

Sample Output

```
1
0
1
```