Divisors of factorial (extreme)

Find the number of divisors of N! (factorial) very fast !

Input

The first line contains an integer T, the number of test cases.

Each line of the next T lines contains two integers N and M.

Output

For each line, output a single line containing the number of divisors of N! (modulo M).

Example

Input:
```
3
10 989
10000 999989
10000000000 999999999989
```

Output:
```
270
616797
40946947081
```

Constraints

$1 \le T \le 10^4$
$0 \le N \le 10^{11}$
$1 \le M \le 10^{12}$

Information

There are 5 input files.

- Input #1: $T \le 10^4$, $N \le 10^4$, TL = 1s

- Input #2: $T \le 5$, $N \le 10^8$, TL = 20s

- Input #3: $T \le 5$, $N \le 10^9$, TL = 20s

- Input #4: $T \le 5$, $N \le 10^{10}$, TL = 20s

- Input #5: $T \le 5$, $N \le 10^{11}$, TL = 20s

My total running time is 3.14 sec. (C++)

Credits

- ivar.raknahs - the original problem (DIVFACT) author
- Francky - the author of DIVFACT2 and DIVFACT3